



Data Portability, Interoperability and Digital Platform Competition



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Foreword

This paper describes the role that data portability and interoperability measures can play in promoting competition both within and among digital platforms. In particular, these measures can address consumer lock-in, promote unbundling, and enable multi-homing. However, they will not be effective in every market, and in some cases may unintentionally hamper competition.

The implementation of portability and interoperability measures with regards to digital platforms is still limited in some cases, and at its early stages in others. However, these limited experiences point to some lessons learned. In particular, the objective of portability and interoperability measures matters. When implemented with objectives other than competition (such as data protection), these measures may not have procompetitive impacts unless designed with market dynamics in mind. Further, these measures may have unintended consequences if they create new entry barriers or entrench incumbent technologies. In addition, implementation mechanisms will be determinative of the effectiveness of these measures; for example, competition authority or independent third party oversight may be needed to set interoperability standards and adjudicate disputes.

Looking forward, the competition concerns motivating data portability and interoperability may be observed in a growing array of sectors, ranging from automobiles to finance. Promoting competition in the design of these measures, or proposing their implementation in order to encourage competition, may therefore be of increasing importance for the competition policy community.

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1. Introduction

Digital platforms connect users, enabling easier business transactions, instantaneous content-sharing and novel products and services. This has led to the creation of new markets and the reshaping of existing ones, in sectors ranging from banking to travel accommodation. The value of these platforms stems partially from the strong network effects they generate, and their significant economies of scale and scope, allowing rapid expansion and extension to new applications. However, these characteristics also lead to market dynamics that have attracted the attention of competition enforcers and policymakers.

While network effects and economies of scale and scope are not new phenomena, digital platforms have given rise to a number of novel concerns. First, user “lock-in” may be particularly strong in these markets. In other words, competition may be dampened because users are discouraged from switching to alternative providers or using multiple providers (“multi-homing”). This effect can stem from high switching costs (including leaving behind content provided to a platform) and the loss of network effects (including connections established with other users). Incumbent firms might amplify these effects in order to protect their position, or at least lack the incentives to ease lock-in.

Second, digital platforms are associated with vertically integrated or conglomerate business models (in particular through the formation of product “ecosystems”). These business models can offer substantial efficiencies, incentivise investments, and enable beneficial offers to users. However, they may also enable and incentivise anticompetitive conduct on the part of dominant firms. This has led to concerns about conglomerate harms, namely tying, bundling and “envelopment” strategies that involve leveraging market power into related markets with overlapping users, as well as vertical harms, such as “self-preferencing”, vertical foreclosure and margin squeeze. Mergers, including the acquisition of potential future competitors, may facilitate these strategies.

Third, there are features on the demand side of markets involving digital platforms that may affect competitive dynamics. Users may exhibit inertia, or a tendency not to shop around when products are provided without monetary charge, as is the case in many digital markets. This may be exacerbated when consumers are also vulnerable to information gaps that make the comparison of complex offers difficult, or to subtle design features that shape their decision-making (including so-called “dark patterns” – see OECD (2021^[1])). This can hamper competition even if a market does not feature a single dominant incumbent. Digital platforms can be the source of these concerns, but may also be part of the solution when they enable easier comparisons of products.

Fourth, the contestability of markets involving digital platforms may be limited in some cases due to the importance of data. In particular, data can give rise to self-perpetuating feedback loops, network effects and economies of scale that enhance the first-mover advantage of incumbent firms.¹ Further, data access can be leveraged across multiple markets, which again could generate efficiencies for users but also enable certain anticompetitive strategies.

Competition concerns associated with digital platforms may be accentuated by several broader economic trends, such as growing mark-ups, declining market entry rates and growing concentration, at least on the sector level.² This evidence suggests that market power may be on the rise, and that it may be becoming more durable, particularly in digital-intensive sectors.

In order to address these concerns, various potential solutions have been identified, ranging from more aggressive enforcement of existing laws regarding anticompetitive conduct, to new merger control thresholds to address the acquisition of emerging competitors. The promotion or mandating of data portability and interoperability is often mentioned as a key part of a digital competition policy reform agenda. In particular, these measures have been highlighted in competition authority studies or expert panels commissioned in Australia³, the EU⁴, Japan⁵, the Netherlands⁶, the UK⁷ and the US⁸, among others.

At their heart, data portability measures aimed at promoting competition seek to reduce user switching costs and reduce the frictions associated with trying new services. This could, in turn, stimulate competition by making it easier for new entrants to attract users and potentially alleviate barriers to entry associated with data access (in those markets for which individual-level data is valuable).

Interoperability measures are distinct but related to data portability, in that they focus on allowing systems to communicate with one another. This could allow users to multi-home and make markets more contestable. Depending on their design, interoperability measures can promote competition *among* digital platforms, by allowing users to preserve network effects on new services, and *within* digital platforms, by allowing users to mix and match different complementary services from different providers. The promotion or mandating of interoperability reflects a judgment that the market has not reached an optimal level on its own. Some have posited that, in contrast to more traditional markets, interoperability initiatives led by firms may be more limited in some online markets due to the pace of innovation, multisidedness, or advertising-driven business models (Riley, 2020, p. 94_[2]).

While data portability and interoperability are distinct and may be implemented in isolation from one another, they can also be closely interrelated. As will be discussed below, effective data portability involving digital platforms may require some degree of interoperability, so that data transfers will be sufficiently useful and dynamic to achieve their competition objectives. Further, they both centre around empowering users to make choices and benefit from competition.

Portability and interoperability measures are not new for the competition policy community, nor are they confined to digital platforms. Telephone number portability measures to encourage competition, for example, date back to 1996 in the US (Buehler, Dewenter and Haucap, 2006_[3]), and interoperability concerns regarding the Windows operating system were being considered by antitrust enforcers around the same time (see Section 4.1.1). More broadly, interoperability standards have enabled the development of a wide range of products, evidenced for example by the array of applications available on mobile application stores. However, the importance of data and the multi-product nature of digital platforms suggest that these markets may be particularly good candidates for portability and interoperability measures.

Despite the significant theoretical attractiveness of data portability and interoperability, experience with applying these measures to digital platforms is still limited, or in the early stages of implementation. However, these limited experiences already point to some lessons learned in terms of the objectives associated with the measure, potential unintended consequences, and strategies for implementation. In particular, portability and interoperability measures implemented with objectives other than competition (such as data protection) may not have procompetitive impacts unless designed with market dynamics in mind. Further, the specific conditions in a market may determine whether the optimal route for implementation is competition enforcement or regulation.

The case for data portability and interoperability measures will vary significantly across markets. They may be ineffective, or may be insufficient and need to be complemented by additional measures in some instances. Nevertheless, the range of potential candidate sectors involving digital platforms is wide. Much of the focus regarding digital platforms has been on software platforms (operating systems for devices and application stores), search and advertising, and social media. However, data portability and interoperability measures can also be considered for a range of traditional sectors being reshaped by digital platforms, including finance, health care⁹, transport¹⁰ and household products. In fact, they have already been

implemented in the banking, energy and transportation sector in some jurisdictions. They may also play an increasing role as various technologies grow (e.g. Internet of Things), and vehicles, appliances and homes become connected and part of a broader technology ecosystem (potentially facilitated by online marketplaces). Each of these sectors may feature the characteristics that motivate data portability and interoperability measures, namely strong network effects, user lock-in and economies of scale and scope.

This paper will highlight the key considerations with respect to the use of data portability and interoperability to promote competition both within and among digital platforms. It builds on a range of past OECD work, including [STI work] and past Competition Committee roundtables on consumer data rights, innovation in the financial sector, consumer-facing remedies, and big data, among others. It is organised as follows:

Section 2 defines key concepts regarding data portability and interoperability, as well as some characteristics of these features

Section 3 described the benefits and limitations of data portability and interoperability measures in promoting competition, and identifies some situations in which they may be most effective

Section 4 explores the different mechanisms for implementing data portability and interoperability measures, including competition enforcement, market studies, and regulation, with examples of past experience for each mechanism

Section 5 highlights some of the key challenges and questions associated with the design and implementation of data portability and interoperability measures

Section 6 concludes.

2. Background on data portability and interoperability

Data portability and interoperability are both broad terms that cover a wide range of functionalities and options available to users (whether individuals or businesses). When referring to data portability or interoperability measures, this paper refers to those imposed in the context of competition enforcement or regulation more broadly, as opposed to voluntary portability or interoperability initiatives implemented by firms. The precise impact of these measures on competition and market structure will depend greatly on their design. This paper will focus on the application of these measures in digital platform markets, including social networks, chatting and communication services, internet-connected devices, e-commerce platforms, online or app-based financial services, and internet-of-things applications, among others.

2.1. Data portability

The term data portability refers in this paper to the “the ability (sometimes described as a right) of a natural or legal person to request that a data holder transfer to the person, or to a specific third party, data concerning that person in a structured, commonly used and machine-readable format on an ad-hoc or continuous basis” (OECD, 2021, p. 9_[4]). Notably, this definition focuses on user-initiated transfers of data, rather than the transfer of larger datasets between service providers (thus excluding the transfer of multi-customer datasets ordered in the context of a refusal to supply case under competition law, for instance). For example, Facebook offers a form of data portability by allowing customers to obtain a copy of their data (including posts and other activity) through its Download your Information Tool

This section will introduce the key parameters of data portability initiatives. These parameters will play a significant role in determining the value of data portability.

2.1.1. The scope of data to be provided

Data portability schemes are shaped by the scope of data to be provided. First, the scope will generally be limited to data pertaining to the requesting user. The precise definition of what constitutes data pertaining to a user may vary significantly. For example, data portability requirements designed within the context of privacy legislation may be limited to personal data (i.e. data pertaining to an individual), whereas competition policy measures may have a broader scope, including data provided by businesses in their purchasing activities, for example (Graef, Husovec and Purtova, 2018, p. 1388_[5]). This paper will focus on user data more broadly, which includes consumer data, defined as “data concerning consumers, where such data have been collected, traded or used as part of a commercial relationship” (OECD, 2020, p. 7_[6]), as well as data concerning business users of digital platforms.

Data can be distinguished according to how it was acquired when defining the scope of portability (see, for instance, OECD (2021_[4]), Graef et al (2018_[5]) and Krämer et al (2020_[7])), namely whether it was:

provided or volunteered by the user (e.g. content inputted by users onto a social media platform)

observed about the user (e.g. usage patterns of a digital product, including time spent and mouse clicks). Notably, this data can sometimes be seen as more reliable in cases where the accuracy of volunteered data is questionable (Krämer, Senellart and de Streel, 2020, p. 54^[7])

derived or **inferred** about the user based on probabilistic analysis (e.g. an online retailer’s assessment of a user’s demographics and preferences based on their purchasing patterns)

acquired, purchased or **licensed** from a third party, such as a data broker.

Derived or inferred data require greater effort to develop, and may involve proprietary analysis and technology. As such, the scope of data portability measures may be limited to exclude data protected as intellectual property. The General Data Protection Regulation (GDPR) in Europe is limited to volunteered and potentially observed data (i.e. excluding derived and inferred data), for example (OECD, 2020^[6]; OECD, 2021^[4]). Privacy legislation may also place limits on the scope of data to be transmitted when it includes personal data, as discussed in Section 4.3.1

2.1.2. The format of the data to be provided

Data portability will only have an effect if other services are able to make use of it (or at least make use of it without incurring significant costs). This will depend on a range of characteristics, namely whether the data is structured, the syntax (or format) of the data, the underlying schema of the data (which define the data fields and constraints on data values), and the semantics (or data dialect) that are required to interpret the data fields (Krämer, Senellart and de Streel, 2020, p. 37^[7]). Data that are highly structured with transparent schema will, all else equal, be much more useful for service providers than data that are unstructured or without an accompanying explanation of the schema.

2.1.3. The mechanism through which data is provided

In addition to the scope and format of data, it is also important to consider *how* the data is being provided under a portability scheme. This includes whether the data is provided on a one-off basis, or if it is possible to obtain a continuous stream of data from the data controller as it is generated. A one-off transfer could require a greater degree of user involvement (such as repeated requests to obtain updated data), and may involve significant delays, which would reduce the attractiveness of data portability options. Such a mechanism could also be associated with the implementation of a “right to be forgotten” under privacy law in some jurisdictions, according to which a user receives a copy of their data after which the data controller deletes it from its system.

Continuous data transfers, in contrast, would require some degree of interoperability between the transmitting and receiving platform, as discussed further below. It would also presumably be of much more use in rapidly evolving markets for data-intensive services, relative to a one-off transfer of data that could become obsolete. An equivalent measure to continuous data portability could be providing third parties with the rights to run algorithms or programs directly on the data located on a data controller’s server (Cabral et al., 2021, p. 22^[8]).

More broadly, Krämer et al (2020^[7]) suggest that in digital platform markets today, the technical challenges to providing continuous data portability are surmountable, although common data schema will need to be developed. This could be accomplished with the use of intermediaries to produce a schema mapping that enables interoperability. Alternatively, data portability could be facilitated through the use of intermediary data controllers (i.e. third parties accessing the data and passing it on), either through the private services of Personal Information Management Systems (PIMS) (Krämer, Senellart and de Streel, 2020, pp. 8-9^[7]) or civil society organisations such as data unions (OECD, 2020, p. 28^[9]). The potential role of PIMS is discussed in further detail in Section 5. below.

2.2. Interoperability

The term interoperability in this report refers to the ability of different digital services to work together and communicate with one another.¹¹ This interconnection can allow users to combine multiple services with complementary functionality, for example when a photo received by email is automatically added to a user's online photo storage service. Interoperability can be categorised as either vertical or horizontal (Riley, 2020, p. 95_[2]):

Vertical interoperability refers to the ability of digital services to incorporate data, content or functionality from an upstream provider. For example, a social media platform that has put in place vertical interoperability with an ecommerce platform could allow users to seamlessly share their purchases and allow their connections to make the same purchase. Vertical interoperability effectively enables users to choose a combination of different digital platforms, products and services, rather than being obligated to select a single service provider (Brown, 2020_[10]).

Horizontal interoperability refers to the ability of digital services to communicate with rival services. For example, horizontal interoperability would enable users of different messaging applications to communicate with each other directly (i.e. without needing to use the same application). Horizontal interoperability can play an important role in some markets but not others. It is difficult to imagine a world where users of different email services could not communicate with each other, but various users of different instant messaging services like WhatsApp and Signal cannot contact each other through those platforms. One cause may be the rapid pace of innovation in digital platforms, which has prevented the emergence of horizontal interoperability, unlike other examples, such as telecommunications, where interoperability emerged over time and was facilitated by regulation (Riley, 2020_[2]).

Continuous data portability will require interoperability in order to function, thus demonstrating the overlapping of the two concepts. Specifically, it requires a greater degree of interconnectedness between systems than does a one-time transfer, and will generally involve some degree of protocol interoperability as well (Cr mer, de Montjoye and Schweitzer, 2019, p. 58_[11]).

Without interoperability, complementary service providers may use "screen scraping" or "terminal emulation" techniques to access a user's data on a digital platform (Zachariadis, 2020_[12]). Essentially, these techniques involve taking data from the customer-facing interface of a platform (e.g. using an automated program to log into a user's social media profile and copying the data through a browser as though it were a human copying the data manually). However, these techniques can create risks for security as well as the stability of the platform, and can therefore be prohibited under a platform's terms of service. Screen scraping has been a major source of debate in online financial services markets, for example (Zachariadis, 2020_[12]).

In order to implement interoperability (and avoid the need to screen scrape), digital platforms require a common technical interface to enable communication and interaction (whether one-way or two-way). This can be provided by a web service or application programming interface ("API"), which can allow streamlined access to a defined set of data or functionality, sometimes combined with an authentication function to ensure the user has granted their consent. When a digital service offers APIs to third parties, it provides a mechanism for these third parties to obtain information or obtain functionality from the service (Riley, 2020_[2]). Such a mechanism is key to many digital platform business models (although not all digital platforms need to share APIs to function), as it gives rise to a multi-sided market with users on one end and service providers on the other (Riley, 2020, p. 99_[2]). This enables the introduction of innovative new services and use of data available on the platform for new purposes (Riley, 2020, p. 99_[2]).

APIs set out how software components communicate as well as what data will be shared and in what format (Gal and Rubinfeld, 2019, p. 750_[13]). This data and functionality may either be broader than what is available to customers when they access the platform (e.g. it may include non-user facing data such as usage

patterns), or narrower (e.g. external services accessing the platform through an API may be prohibited from modifying a user's data on the platform) (Krämer, Senellart and de Streel, 2020, pp. 40-41^[7]).

APIs and other standards to enable interoperability can either be closed, meaning they are unique to each platform, or can be based on open standards (OECD, 2018^[14]). Open standards allow third party service providers to build their systems around a standard that would be interoperable with multiple platforms, helping to manage costs and increase their viability and attractiveness to users. However, access to APIs for digital platforms will often be subject to restrictions if there are privacy, security or technical limits that must be placed to prevent misuse or degradation of the platform's functionality (Riley, 2020, p. 99^[2]). In fact, platforms can play a desirable rule-setting function in controlling access and use (although this role may be misused for anticompetitive purposes) (Fletcher, 2020, p. 10^[15]). Further, while APIs can greatly facilitate data access and interoperability, they may not on their own guarantee the seamless use of data from one platform by another (Gal and Rubinfeld, 2019, p. 750^[13]).

The precise nature of interoperability schemes and measures will vary according to the markets involved. The UK Competition and Markets Authority's market investigation into online advertising considered "content interoperability", which allows users to "post, view and engage with content across platforms without having to switch service" (Competition and Markets Authority, 2020, p. 372^[16]). This definition has parallels with the type of interoperability envisaged in Open Banking reforms, which seeks to allow users to access multiple bank accounts and services through a single application (Competition and Markets Authority, 2016^[17]).

Summary of background on data portability and interoperability

- The term data portability refers in this paper to the ability of users to request that a data holder transfer to them or a third party data about them in a structured, commonly used and machine-readable format. This definition focuses on user-initiated transfers of data, rather than the transfer of multi-user datasets between service providers.
- Data portability measures vary in terms of the scope of data they involve (for example, data provided by the user, data observed about a user, or data inferred about a user), the format, and the mechanism through which data is provided (including whether it is one-off or continuous).
- Interoperability refers to the ability of different digital services to work together and communicate with one another. Digital platforms can develop application programming interfaces (APIs) which enable these connections. Access to APIs can be restricted by digital firms for security reasons, although some APIs are public and provided on an open source basis.
- While data portability and interoperability refer to distinct concepts, they may overlap as well. For instance, continuous data portability requires interoperability in order to enable systems to communicate with one another to share data on an ongoing basis.

3. The use of data portability and interoperability measures to promote competition in digital platform markets

Digital platforms bring together different groups of users, and in many cases this will require interoperability. For example, individual users will require vertical interoperability between a platform and the device or application they use to access it. Sellers, content providers and advertisers may also need vertical interoperability to obtain the information they need about transactions and to process orders. Indeed, the success of some digital ecosystems and online marketplaces can be attributed to the access given to users to a wide and dynamic range of products offered by third parties. In other markets, new third-party services have been introduced to facilitate interoperability or data portability. For example, the company Plaid acts as an intermediary by offering a single API to connect financial institutions and FinTech applications.¹²

The level of both vertical and horizontal interoperability, as well as data portability that is offered in a market may not be optimal from a consumer welfare, or broader economic productivity and innovation perspective. This may be due to differing incentives in a market, between incumbents and new entrants, or between integrated firms and those active only in part of a supply chain (Gal and Rubinfeld, 2019, p. 762_[13]). For example, it may well be in the interest of incumbents to make user switching more difficult by limiting the portability of their data. Even when interoperability or portability are in place, they may be designed in such a way as to advantage incumbents. The likelihood of this occurring in digital platform markets may be significant, given that conglomerate or vertically integrated business models are common in a range of markets.

In other cases, a lack of interoperability or data portability may simply be due to collective action problems (i.e. barriers to collaboration and joint investments). Developing the standards and procedures to make these arrangements work could require communication, including with competitors in the case of horizontal interoperability, which could be unattractive for competitive reasons or create concerns about competition law violations (Gal and Rubinfeld, 2019, p. 763_[13]).

Regardless of the cause, limited data portability or interoperability can dampen competition in a market, with consequences for consumers and economic dynamism. Policymakers and enforcers can seek to promote more portability or interoperability in order to address specific cases of misconduct, or broader conditions in a market associated with low competitive intensity. With respect to the latter, portability and interoperability may be a preferable form of intervention in markets, compared to alternatives including industrial policy seeking to subsidise new entry that may lead to competition distortions (OECD, 2018, p. 100_[14]). However, the overall effectiveness of these measures, their costs, and the risk of unintended consequences, will depend significantly on the conditions of a given market. This section sets out the conditions in which data portability and interoperability can promote competition, as well as potential risks and limitations of these measures.

3.1. The potential competition benefits of data portability measures in digital platform markets

While not designed with competition alone in mind, data portability measures have been characterised as a potential solution (or part of a solution) to competition problems in digital markets. This section will explore how data portability can address concerns regarding the durability of market power stemming from data access or switching costs.

Portability is not a new concept: telephone operators were required to enable consumers to take their telephone numbers with them when switching to new providers as far back as 1996 in the US, for example.¹³ These measures, implemented in many jurisdictions, generally eased switching and benefited all consumers through more intense competition in the market (Buehler, Dewenter and Haucap, 2006^[3]), with the greatest benefits in jurisdictions with more stringent requirements regarding the maximum timeframe for porting to be completed (Lyons, 2006^[18]).

However, the nature of the effects in digital platform markets may be different. Data plays an important role in economic activity, to such an extent that it has been characterised as “the new oil” (The Economist, 2017^[19]). While this is true of many sectors, data play a particularly fundamental role in digital platform markets. First, data in the form of user inputs are what drive social media and content-sharing platforms. Second, data are the input into algorithms that power other digital platforms, such as search platforms, and are more broadly used to improve service quality as well as ad targeting. Third, data are used to directly earn revenue, through their sale to third parties.

Data are also a contributor to market power in digital platform markets, not only because data are important in these markets, but also because of the characteristics they exhibit: economies of scale and scope as well as network effects. Economies of scale arise because there are substantial fixed costs (both in terms of processing capacity and learning by doing) associated with data collection, processing and analysis, while the marginal cost of collecting an additional piece of data can be negligible (OECD, 2016, p. 11^[20]). In fact, for many applications in digital markets, scale is crucial for data to have any value whatsoever (Autorité de la concurrence and Bundeskartellamt, 2016, p. 60^[21]). Taking the three applications of data listed in the paragraph above, it is clear that a minimal dataset would not make for a valuable social network, content-sharing platform, predictive algorithm or advertisement-targeting tool.

A dataset can also have multiple applications, meaning that data collection can exhibit economies of scope. Data gathered in one digital platform market can be a valuable asset for entering other digital markets – particularly when there are overlapping consumers (see, for instance, Condorelli and Padilla (2019^[22])). Data about an individual’s listening habits on a music platform can be valuable for a concert ticket sales service, for example.

Finally, data collection can give rise to network effects (gains enjoyed by consumers of a product when more consumers use that product (OECD, 2019, p. 6^[23])) and self-perpetuating “feedback loops” (OECD, 2016, p. 10^[20]). In particular, when a user joins a platform and provides their data, the value to existing users can increase either directly (e.g. when there is more content available on a content-sharing platform) or indirectly (e.g. when an increased user base improves the quality of an algorithm, or, by improving ad-targeting, enables investment in greater platform quality).

In addition to being a source of market power through economies of scale and scope and network effects, data may also contribute to the durability of market power and thus lower contestability of markets. First-movers in a market may, through the feedback loops noted above, acquire a position in terms of data collection and processing capacity that could be difficult to overcome. This advantage may be leveraged into other markets, increasing both the scope and durability of market power (OECD, 2020^[24]).

This scenario of limited market contestability, which paints a bleak picture for competition, is most likely to arise under certain market conditions. First, the data in question must be important enough to the

functioning or quality of the product that it gives rise to market power. Second, there must be significant barriers to potential market entrants getting access to these data, or substitutes for them (including through innovations that circumvent the need for the data in question).

While data can contribute to entry barriers and low contestability on the supply side, they can also be associated with competition problems on the demand side. In particular, the lack of competitor access to user data may result in user “lock in” to incumbent services (Engels, 2016, p. 2_[25]). This effect can be thought of as a switching cost (which, all else equal, can dampen competition). For example, users may be dissuaded from switching to another social network if they must re-upload all of their photos, content or profile information. The magnitude of this effect will vary across platforms, according to both the importance of a user’s accumulated data (e.g., whether historical content is important) and the volume (e.g. whether it would be a major effort to re-upload the content onto a new platform). However, it can represent a significant obstacle to users selecting alternatives and to the new firms entering the market. Lock-in may be the result of structural features of the market, but it may also be created or exacerbated by either the strategies of dominant firms, or collusion to keep new entrants out (Swire, 2020, p. 46_[26]).

Data portability measures seek to address lock-in by allowing users to take their data with them to a new provider. They reflect a key characteristic of data: it is non-rival, meaning that access by one firm to a dataset need not preclude access by another firm, as would be the case of physical assets (although some data portability measures involve the deletion of data after it is ported, which could encourage “competition for the consumer”).

The theoretical appeal of data portability is significant: it reduces switching costs, easing entry by new market participants and intensifying competition among firms already in the market (Giovannetti and Siciliani, 2020_[27]). It could also enable multi-homing, since users would be less tied to a given platform if they were able to move their data to multiple providers (Engels, 2016, p. 5_[25]). At the same time, data portability is initiated by the user, which can help avoid the conceptual and legal challenges associated with ordering firms to share access to entire datasets in the context of refusal to deal cases under competition law (discussed further below).

In addition, these measures could promote competition across multiple markets with overlapping users. Without data portability, dominant firms in one market may be able to use their data to acquire market power in other markets, including through product “ecosystems” (Bourreau, 2020_[28]). Data portability could theoretically ensure that firms in those related markets are still able to compete, provided much of the insurmountable advantage of the dominant firm arises from access to data that can be ported. For instance, a firm may be able to enter a market with only some of the products within a broader ecosystem, rather than needing to replicate an entire ecosystem in order to obtain the data required (Giovannetti and Siciliani, 2020, pp. 3-4_[27]). In fact, some suggest that data portability may be most effective at promoting competition in new or developing markets rather than those with a dominant incumbent (Krämer, Senellart and de Streel, 2020, p. 9_[7]).

The implementation of data portability could affect the nature of competition in a market. Without it, firms in data-intensive markets may compete for consumers’ attention and time in order to collect their data (see, for example, Prat and Valletti (2021_[29])). Given the market characteristics described above (e.g. significant economies of scale and scope in data collection), this may lead to durable market power and significant first-mover advantages. Proponents of data portability suggest that it could spur innovation by taking advantage of the non-rivalry of data to promote competition on the basis of data analytics and usage rather than data collection (Krämer, Senellart and de Streel, 2020, p. 53_[7]). One recent empirical study found indeed that data portability can drive investment in data processing by incumbents in certain markets, provided they face some competition (Ramos and Blind, 2020_[30]). More broadly, greater data availability could address market power issues by reducing the need of firms to rely on a single dataset held by a dominant firm (Gal and Rubinfeld, 2019, p. 757_[13]). Data portability in platform markets could also spur

competition in other markets connected by data, such as appliances and smart home products connected through the internet of things (Gal and Rubinfeld, 2019, p. 759^[13]).

Data portability can also play a role in addressing information asymmetries in markets with opaque or complex fee structures. In particular, it may facilitate comparison services that take a consumer's characteristics or history and determine the overall costs of different providers in a market. One particular example is retail banking, where different fee structures made it difficult for consumers to assess their options. In its market investigation, the UK Competition and Markets Authority imposed data portability remedies which, among other things, would enable one-stop comparison shopping services (Competition and Markets Authority, 2016^[17]).

As noted above, the impact of a data portability will depend on the market in question. User benefits from porting their data to a new digital service would be proportionate to the degree of customisation or personalisation involved in the service (Krämer, Senellart and de Streel, 2020, p. 56^[7]). The scope of the data covered under portability also matters – observed data may be more valuable and accurate than provided data in some cases, but may be less relevant if the data is being ported to a different type of service. Engels (2016^[25]) suggests that data portability may be the most beneficial in specific situations, namely when it facilitates the entry of complements, or when it promotes competition in markets that feature a dominant incumbent engaged in anticompetitive conduct (rather than markets where the entry of substitutes is difficult due to the superiority of the incumbent product).

3.2. Risks and limitations of data portability measures in digital platform markets

The term data portability refers to a broad range of functionality and initiatives, ranging from a one-time download of unformatted data provided after a significant delay, to broad, real-time data sharing between digital services using a common API. Thus, the devil is in the details, and the effectiveness of data portability will in large part depend on the context of the market, the design of the measure and the existence of complementary measures. In some situations, data portability may do little to promote competition in digital platform markets, and may even lead to anticompetitive outcomes, in stark contrast to successful applications in other sectors (such as mobile telephone mobility, described above).

Current experience in some digital platform markets suggest that access to ported data on its own may not be sufficient to enable the entry of competing products. For example, both Google and Facebook already offer users the ability to obtain a copy of their information.¹⁴ Further, Apple, Facebook, Google, Microsoft and Twitter currently contribute to the Data Transfer Project (DTP), an open-source data portability platform launched in 2018.¹⁵ DTP goes beyond simply facilitating the download of data, and in fact aims to ensure the interoperability of the data with other services. Specifically, it facilitates data portability by accessing a user's data on a platform using its API, transferring the data into a common format, and then reconverts it into the API of the service to which the user wishes to transfer their data.

These initiatives have not led to the introduction of competing services using ported data (Nicholas and Weinberg, 2019^[31]). The UK Competition and Markets Authority observed that even Google's social networking service was unable to compete with Facebook, despite the latter's significant access to user data (Competition and Markets Authority, 2020, p. 138^[16]). A similar outcome was observed in the retail banking sector, where portability of data regarding bill payments did not lead to a significant increase in switching (Giovannetti and Siciliani, 2020^[27]). One recent study of the data made available to Facebook users found, based on interviews with tech industry engineers and executives, that it is not possible to "replicate Facebook with Facebook data" (Nicholas and Weinberg, 2019, p. 3^[31]).

One potential reason for this limited impact may be the mechanism through which data is provided to users, which may introduce frictions into the process, or impose a burden on consumers in terms of technical understanding. Thus, data portability measures may need to include the ability for users to give consent

for automated data transfers (either directly in the process or through a third-party service) (Krämer, Senellart and de Streel, 2020, p. 76^[7]).

More fundamentally, as emphasised by the Australian Competition & Consumer Commission (ACCC), data portability will have a limited impact in concentrated digital platform markets featuring significant barriers to entry and expansion, since users will not have a competing service to switch to in the short or medium term (Australian Competition & Consumer Commission, 2019, p. 30^[32]). Thus, data portability measures on their own may be more suitable in promoting innovation and ensuring contestability in markets that are related or complementary to digital platform markets, and which do not yet feature a dominant incumbent (Krämer, Senellart and de Streel, 2020^[7]).

In general, data portability may not be effective in addressing competition problems on its own, and its effectiveness may be limited in some situations, namely when:

- **The scope of the ported data is limited** due to privacy constraints, for example messages or content from other users would not be included, thus diminishing the value of the ported data.
- **Economies of scale from data processing are limited**, as new entrants would have access only to the data of those users porting their data. Thus, the significant advantages of incumbents, for example in terms of algorithm quality due to data availability, could not easily be replicated through data portability (Nicholas and Weinberg, 2019, p. 18^[31]; Gal and Aviv, 2020, p. 25^[33]).
- **Strong network effects are present**, which could also impede the entry of new services even if they have access to a user's data. In other words, even if a user is able to bring their profile information and content with them to a new platform, their willingness to switch may be limited if they cannot interact with their friends and contacts on the new platform (Gans, 2018, pp. 12-13^[34]). This effect may vary among consumers, for instance younger users may be more open to trying new social networking services than older ones (Giovannetti and Siciliani, 2020, p. 3^[27]). However, even when data portability allows users to multi-home, a dominant incumbent's position is likely to remain incontestable in the presence of network effects – users may multi-home, but they are likely to keep using the “must-have” dominant service (Competition and Markets Authority, 2020, p. 129^[16]). Further, in markets featuring strong network effects, the elimination of switching costs may in fact cause the market to tip into monopoly, an unintended consequence of data portability measures seeking to promote competition (Krämer, Senellart and de Streel, 2020, pp. 58-59^[7]). In general, data portability may be more effective for digital services without strong network effects, for example the value of being able to bring music streaming playlists across services would not likely be affected by the behaviour of other users (Nicholas and Weinberg, 2019, p. 3^[31]).

An additional limitation of many extant portability features is their static nature – new services may be unable to compete using only one-off data transfers that become rapidly outdated, as opposed to continuous flows of data. Some observers have opined that this is not due to technical obstacles to continuous portability (Krämer, Senellart and de Streel, 2020, pp. 42-43^[7]).

However, one-off exports controlled by a user can avoid some issues that may arise when rival or complementary services rely on a platform's API for continuous data access. In particular, continuous data portability functionality could enhance a dominant platform's position by granting them power and visibility over data use by potential rivals that build their business around data access. This could include unilateral API access changes by incumbents, as described further in Section 3.4 below. In addition, some platforms may be able to monitor competitor behaviour when using APIs to access data, increasing risks of potentially abusive conduct. This could include using information about data access patterns to “clone” the functionality of competing or complementary services, which would limit the procompetitive potential of data portability measures (Nicholas and Weinberg, 2019, p. 21^[31]). Thus, any measure to implement data

portability may need to include considerations regarding the potential ability of digital platforms to cut off access to rivals or otherwise

The imposition of data portability measures are likely to affect firms' incentives regarding data collection. For example, they may reduce incentives to invest in data collection that is beneficial to users. However, there is a distinction between data and knowledge, and data portability may in fact encourage greater focus on investments in data analysis and innovative applications to improve knowledge (Krämer, 2020, p. 7^[35]) as this becomes the way to escape competition. Further, in at least some markets, data harvesting is "nearly costless" (Kerber, 2019, p. 401^[36])

Mandated data portability may also risk unintended consequences in some situations. By reducing switching costs associated with data, it may make users more willing to provide their data to a platform (since there would be fewer concerns about it being difficult to access later on), raising data protection and digital security concerns, and could even enhance the position of incumbents in the process (Lam and Liu, 2020^[37]). It can also increase the amount of information held by new entrants that take in ported data and collect new types of data, which could be interpreted as a reduction in quality from the perspective of users who prefer that fewer parties have access to their data, all else equal (Wohlfarth, 2017^[38]). Further, portability requirements that apply to all firms in a market may prevent entrants from acquiring a foothold, by giving incumbents access to their data (Krämer, Senellart and de Streel, 2020, p. 13^[7]). It may also lead to distributional effects, particularly when users exhibit differing degrees of switching costs (Giovannetti and Siciliani, 2020^[27]), or when new users without data to port may get a worse deal than those who have already been in the market for some time (Krämer, Senellart and de Streel, 2020, p. 57^[7])

Implementing data portability can also involve clashes with other policy objectives and legislation. In particular, datasets held by firms may be subject to copyright, trade secret, or other proprietary rights, given the investment and effort that may have been required to create them. This may give rise, in some cases, to conflicts with firms' intellectual property rights (Graef, Husovec and Purtova, 2018, pp. 1374-81^[5]). Graef et al highlight the example of data on customer shopping patterns obtained by a grocery chain through its loyalty card, the development of which would require significant investments, leading to potential risks of free-riding by competitors under data portability requirements (2018, p. 1382^[5]). They also flag the risk of recipients of provided or observed data being able to "reverse-engineer" inferred data that reflects proprietary analysis, even when said data is not covered by data portability, by observing the structure and content of a ported dataset (2018, p. 1384^[5]).

Finally, data portability measures may also lead to greater personalisation of products and services around a user's profile (Gal and Rubinfeld, 2019, p. 755^[13]). Such personalisation could lead to concerns on the part of consumer protection regulators (see, for instance, OECD (2018^[39])), highlighting the need for consultation and careful balancing in the design of data portability measures.

3.3. The potential competition benefits of interoperability measures in digital platform markets

Few digital platforms operate on a wholly standalone basis. In fact, connections with complementary or downstream services can be a fundamental part of their value proposition: the demand for a mobile operating system will depend on the variety of compatible applications that are available, for example. However, limitations to the level of interoperability in a market may hamper competition. Interoperability measures may be an effective strategy for addressing these situations.

Specifically, measures to promote **horizontal interoperability** can promote competition *among* digital platforms. For example, in some markets, users experience lock-in because they will lose network effects such as social connections (also called a user's "social graph" (Zingales and Rolnik, 2017^[40])) when switching to, or multi-homing on, a new platform. Interoperability measures can help ensure the incumbent

and new platform communicate with one another, allowing the user to retain network effects. This can help prevent a market from tipping into monopoly (Fletcher, 2020, p. 3_[15]).

However, the appropriateness of horizontal interoperability measures will depend on the specific conditions in a market. While a lack of horizontal interoperability could constitute a barrier to entry in a market and dissuade users from switching, in other cases the impact on competition may be more benign, and there may in fact be vigorous competition between different closed systems (Bourreau, 2020, pp. 6-7_[28]), particularly when switching costs are low. In other cases, there will be a clear link between competition and interoperability. Specifically, competitive pressures (and the lack of a single dominant platform) may encourage interoperability initiatives. One possible example is the arrangement between Microsoft and Google to improve interoperability between Google Calendar and Microsoft Exchange (Brown, 2020, p. 23_[10]).

Vertical interoperability is focused on promoting competition *within* digital platforms or ecosystems. It may be particularly important for consumers when competition *between* digital platforms or ecosystems is limited by structural lock-in effects that are difficult to address (such as when the cost and long life of some products limit switching) (Kerber, 2019_[36]). A lack of vertical interoperability may exacerbate this lock-in, for example if consumers face the need to change all of their downloaded applications and associated services if they change mobile devices and operating systems

In contrast to horizontal interoperability, vertical interoperability has been more of a focus of competition policy attention, due to concerns of market power in one market being leveraged into others. These concerns may be particularly pronounced in digital platform markets, given the nature of the services and business models involved. Measures to promote vertical interoperability can allow users to mix and match different complementary products from different firms (and potentially from different ecosystems), helping to prevent the emergence of market power through anticompetitive leveraging.

.Vertical integration and conglomerate business models are a common feature of digital markets – large digital platform operators tend to offer numerous different services. These services may be complements, meaning that they may be more valuable to a user if obtained together. They may also be only minimally related, but feature an overlapping base of users. Firms may bundle these services together, or otherwise interlink them to form a digital ecosystem of products (see, for instance, Bourreau (2020_[28])). Linkages between digital services can take various different forms, including common authentication and account logins, accessibility through each other’s user interface, embedding of one service’s functionality into another, bundled downloads and pre-installations, or bundled discounts, among others.

These linkages can deliver significant benefits to users, including ease of use and convenience. In addition, digital product linkages enable the emergence of innovative business models centred around cross-subsidisation and new pricing arrangements. For providers of complementary services, linkages with a central ecosystem platform may also be its primary means of attracting users, and a way of leveraging existing functionality, such as account authentication and sign-in functions (Riley, 2020, p. 97_[2]). They may be essential for technical reasons as well, since interoperability can ensure that services continue to communicate and function after changes are made (e.g., when one is updated) (Fletcher, 2020, p. 5_[15]). However, digital product linkages can also shape competitive dynamics significantly once users have selected an ecosystem, particularly if they prefer a seamless experience over a wide variety of choices (Fletcher, 2020, p. 6_[15]).

Thus, competition concerns may arise when dominant digital platforms, which can play a “gatekeeper” role between firms and users, limit interoperability with other firms’ services – particularly when the gatekeeper offers a competing service. For example, a firm could attempt to leverage its market power in one market into another, or to preserve its market power by keeping potential competitors from developing a foothold in related or complementary markets (see OECD (2020_[24])). Platform operators will often have an incentive to encourage use of their APIs to attract more content or features, thus attracting more users; however when they introduce their own content or features, these incentives become more complex (Riley, 2020,

p. 100^[21]). Limited interoperability, for example in the case of a closed API, may serve as a powerful entry barrier, as a firm would theoretically need to offer users the full ecosystem of services provided by the gatekeeper in order to compete with the latter's closed system (Bourreau, 2020, p. 8^[28]). This can create significant first-mover advantages as well. Interoperability measures can address these concerns by “facilitating ongoing competition on the merits of the user experience, rather than on the size of the installed base” (Stigler Committee on Digital Platforms, 2019, p. 118^[41]).

Recent experience demonstrates the importance of interoperability for the viability of firms offering complementary products in digital platform markets. The UK Competition and Markets Authority's inquiry into digital advertising markets highlighted the example of changes to Facebook's API, which resulted in the failure of numerous third-party applications and services (Competition and Markets Authority, 2020, p. 312^[16]). These changes were framed as a response to privacy issues in the wake of the data leaks and misuse by Cambridge Analytica, illustrating the trade-offs that procompetitive interoperability measures may face in digital platform markets, as explored further below (Riley, 2020, p. 100^[21]).

Interoperability has also been used to try to unbundle services and promote innovation in the banking sector. Open banking reforms in the UK, described in Section 0below, sought to address low rates of switching and high prices through interoperability measures, including a common API. These measures enable users to multi-home and access various banking and complementary services through a single digital platform. Thus, the promotion of competition through interoperability measures involving digital platforms need not be limited to markets dominated by tech firms, but can be used to improve the contestability of markets defined by well-established incumbents in traditional sectors.

The use of standards, such as a specific API, is an important mechanism for implementing interoperability between services. Standards can set a common communication language and procedure for communication between digital services, and work to interconnect multiple services offered by the same firm as well as services offered by different firms (Box 1 describes the role of standard-setting processes and their benefits). When standards are closed, meaning they are set by and unique to a given firm, they may give rise to concerns regarding abusive conduct. For instance, a dominant firm may give its downstream products exclusive or preferential access to a standard. In contrast, open standards can help avoid disputes regarding access to, and design of, standards. Interoperability measures may not need to focus on open standards to be effective, however, since ensuring that closed APIs retain interoperability could have a procompetitive effect in some markets as well (discussed further below). However, the existence of standards on their own is not a guarantee of market contestability – outdated standards may be supplemented by a dominant firm's own proprietary procedures, and thus rendered ineffectual (Brown, 2020, p. 49^[10]).

Box 1. The benefits of standard-setting processes and the forms they can take

Standards refer to “common characteristics for a good or service” (OECD, 2010, p. 19^[42]). Standard setting can have significant benefits for consumers and the economy more broadly. It can enable the creation of new markets which require co-ordination among different firms in terms of technologies to be used. It can also help generate economies of scale in the use of a given standards-compliant technology and enable the entry of new firms (for example by ensuring compatibility with incumbent complementary products).

Standards can be developed in different ways. One firm's product features, such as data formats or procedures for accessing certain systems, can become **de facto standards** simply by widespread adoption by other firms, or due to the dominant position of the firm in question. However, in other cases, additional co-ordination may be required.

Standard-setting organisations (SSOs), for example, can facilitate industry-led standard development. These organisations allow members to discuss and decide on standards, and may impose certain terms on members when their intellectual property overlaps with a standard. In particular, an SSO may require its members to disclose whether they hold patents that would be essential for implementing the standard (a standards-essential patent, or SEP), and obligate them to offer access to these patents either on a royalty-free, or fair, reasonable and non-discriminatory (FRAND) basis.

Finally, there may be cases when **governments play a role in standard setting**, beyond the outcomes reached by industry alone. They may register and enforce certain standards through industry self-regulatory frameworks, impose specific standards of their own through regulation, or provide inputs to industry-led standard setting through SSOs. A role for governments may be particularly necessary when private sector-led initiatives may be subject to co-ordination problems, leading to market failures. Government standards have played a key role in developing certain markets in the past; for example, the imposition of a common GSM standard for mobile telephones in the EU enabled cross-border roaming and greater mobile penetration rates compared to the US, where standards were not imposed (Cave, Genakos and Valletti, 2019, p. 56^[43]).

Source: OECD (2010^[42]) and OECD (2015^[44]).

While questions of standards and interoperability are not unique to digital markets, they may exhibit unique dynamics in these markets. The importance of data, and in particular access to real-time data streams, is one unique factor (Fletcher, 2020, p. 10^[15]). Another is the fact that the roles of different players in a digital ecosystem are not fixed, and may vary, blurring the lines between vertical, horizontal and conglomerate relationships. Further, questions of interoperability or portability can involve third-party intermediaries to facilitate data transferral or service connectivity.

3.4. Risks and limitations of interoperability measures in digital platform markets

Interoperability measures seek to enable and promote competition by ensuring common interoperability standards that allow different services to communicate and work with one another. The theory of competition harm from a lack of interoperability is clear, as it can represent a barrier to entry and an exclusionary tactic to monopolise a market. However, interoperability measures can also have an effect on innovation incentives and market power that limit their procompetitive potential.

As described above, some digital platforms lack horizontal interoperability. This may be due to the underlying incentives of platform operators, or even the challenges associated with standard-setting due to rapid growth and changing nature of the services on offer as well as user preferences. Thus, common interoperability standards may be less effective in facilitating entry and innovation if rapid market evolution could make them obsolete (Riley, 2020, p. 98^[2]).

In seeking to promote competition, interoperability measures that mandate certain standards may also have the effect of entrenching certain technologies, business models or gatekeeper firms. While this could address investment co-ordination problems that theoretically exist in ecosystems (since firms would be less willing to invest in products with uncertain prospects of interoperability), it may also affect competition incentives. For instance, if a standard entrenches a given digital platform's features and protocols across a market, it may create stronger market power and thus greater incentive and ability to engage in anticompetitive leveraging strategies in related markets. Depending on the strength of this effect, other remedies may need to be considered, including in certain situations structural separation (see, for instance, Riley (2020, p. 103^[2])).

In particular, entrenched interoperability standards could limit the ability of innovations to enter a market, as well as the incentives of firms to develop competing standards, thus dampening competition for the market dynamics (Crémer, de Montjoye and Schweitzer, 2019, p. 59^[11]). This effect may however be mitigated by the ability of new firms to enter the market due to lower switching costs and the preservation of network effects (Engels, 2016, p. 8^[25]). The potential competition risks associated with implementing measures such as interoperability through standard-setting are set out in Box 2 below.

Box 2. Potential competition risks associated with standard setting.

While standard setting can play an important procompetitive role, the process may also give rise to risks of anticompetitive outcomes and behaviour. This can include the manipulation of standard setting to exclude rivals with different product characteristics, or to entrench an incumbent's technology. When there are no transparency and FRAND obligations, several other forms of exclusionary or rent-seeking behaviour may also emerge. Firms may engage in "patent ambush" where they conceal their patents until after a standard has agreed, at which point they assert the patents to gain from licensing agreements or exclusion. SEP holders may also engage in patent hold-up (delaying negotiations or demanding unreasonable license fees) or royalty stacking (when a standard involves numerous SEPs held by the firm, each needing to be licensed for a fee). Even when FRAND obligations are imposed, however, there may be significant disputes about what terms meet this standard. Competition authorities, courts, and SSOs can all play a role in adjudicating these disputes, depending on the circumstances.

Source: OECD (2010^[42]), OECD (2015^[44]) and OECD (2019^[45]).

The mechanism of interoperability standard implementation will play an important role in determining their competitive impact. Standards-setting processes that are governed or controlled by an incumbent may be prone to self-preferencing, and could enhance their gatekeeper position while granting them a clear lever of exclusion (Riley, 2020, p. 97^[2]). One example could be the use of a single account authentication provided by an incumbent platform to log into multiple services. While this interoperability can be convenient for users and may facilitate entry of new services using this functionality, it may also entrench the position of the incumbent digital platform and lead to lock-in. In particular, it would increase the costs of switching from the incumbent platform, if this would entail changing accounts for each of the connected services (Riley, 2020, p. 103^[2]).

The implementation of interoperability standards may thus require some degree of regulatory oversight (Krämer, Senellart and de Streel, 2020, p. 58^[7]). The latter could include imposing behavioural restrictions on firms managing the standards, such as requiring fair, reasonable and non-discriminatory access to portability standards, akin to the approach regarding standards-essential patents (Swire, 2020, p. 67^[26]). Alternatively, an independent third party organisation could be mandated to design and implement common standards, for example through an SSO. The latter approach was taken in the implementation of open banking reforms in the UK, in order to ensure broad representation in standards setting, including from SMEs and consumers (see Section 4.3.2).

The effectiveness of common interoperability standards can also be undermined if there is significant variation among market participants in terms of how they are implemented, or if additional proprietary standards are layered on top. For example, a provider of an internet browser add-on may only test their service on the dominant browser in the market, assuming that interoperability would prevent the emergence of any problems on other competing browsers, even if idiosyncratic standard implementation could mean this is not the case (Riley, 2020, p. 101^[2]). Thus, the dominant firm's position could remain secure if the add-on encounters errors on other web browsers.

Even well designed interoperability standards may have minimal impact on a market competition if consumer behaviour limits the contestability of the market. For example, in an ecosystem in which a dominant firm offers multiple complementary products, individuals may exhibit a low tendency to switch or use third-party service providers. This could be due to low interest in shopping around as a result of inertia, status quo biases, default biases or even the “free effect” (wherein consumers favour zero-priced products even if much better quality alternatives are available at low prices) (OECD, 2019, pp. 121-122^[46]; Fletcher, 2020, p. 8^[15]). These behavioural tendencies can also be amplified by firm strategies that can limit the impact of interoperability on competition.

More generally, dominant firms may employ a range of strategies to mitigate threats to their position due to interoperability measures. Gatekeepers may feature their products more prominently, introduce frictions in switching and multi-homing, and employ strategies such as tying or even acquire competitors to maintain “moats” around their core products (Fletcher, 2020, p. 9^[15]).

In addition, interventions that seek to promote interoperability, data portability, and competition across ecosystems may lead to greater price transparency as well as more multi-market contact (Fletcher, 2020, p. 11^[15]), potentially facilitating either explicit or tacit collusion.

Another risk of anticompetitive conduct stemming from interoperability relates to abuses of dominance. APIs for example do not address the underlying market power of incumbents, and may grant them significant influence over competitors. As noted in the preceding section, if an incumbent makes small changes to APIs or layers on additional procedures, it could have a fatal effect on the business model of firms relying on the API (Nicholas and Weinberg, 2019, p. 8^[31]). Further, as with data portability, incumbents may monitor their competitors’ use of APIs in order to “clone” competitor products, or otherwise use their disproportionate visibility into competitor activities to implement anticompetitive strategies (Nicholas and Weinberg, 2019, p. 21^[31]). Thus, the implementation of interoperability measures could require monitoring and a dispute resolution mechanism to provide entrants with the means of addressing these strategies (further discussed in Section 5.3).

Finally, the design of interoperability measures must take into account security and privacy risks: greater third-party access to a platform could lead to risks of compromised personal data or security breaches. For example, a small third party does not have the same resources to protect against hacking as large platforms, and so interoperability measures requiring connections with these services may create vulnerabilities. Further, the damage of such security breaches could be compounded if they grant access to numerous platforms and services (Gal and Rubinfeld, 2019, p. 756^[13]). The precise balance will vary across markets, and potentially even individual users, making it challenging to design these measures, particularly in the context of competition authority enforcement proceedings (Riley, 2020, p. 98^[2]) (as discussed further below).

3.5. Identifying markets in which data portability and interoperability measures will be the most effective

Considering the potential competition benefits, risks and limitations of both data portability and interoperability measures, it is clear that these measures do not represent a blanket solution to all competition concerns in digital platform markets. Further, they may have unintended harmful consequences for competition, or at least minimal effects, in certain situations. Past experience and new research suggests some considerations for the optimal use of these measures, which will be summarised below.

In order for data portability to play a role in reducing user switching costs, the ported data must be provided in a useable form, and so some level of interoperability is required. Further, in situations where only real-time data sharing is likely to be useful for users, interoperability through APIs may be necessary, particularly if it is desirable to avoid “screen-scraping” due to potential effects on platform stability. Likewise, interoperability can often involve the transmission of data, such as user content, between services.

Data portability as a standalone measure may be most relevant when network effects are not significant. Static data portability could, for example, be useful when users are not likely to multi-home, and only choose a single service provider, meaning that they will take their data with them and cease using the previous service. This would likely only be feasible if the user does not face the prospect of losing the value obtained from social connections or other network effects on an incumbent service. For example, a user porting their song preferences and playlists to a new music streaming service could benefit from a static portability service. This would be the case if the user is not likely to pay for multiple services at the same time (e.g. if there is no difference in music selections) and the service does not rely on connections with friends (see, for instance, Nicholas and Weinberg, (2019, p. 3_[31])).

In markets where it is feasible for users to multi-home, for example if there are multiple zero-priced services offering similar functionality for different contexts, dynamic data portability may help ensure market contestability by allowing users to mix and match or at least switch among different providers.

When network effects play an important role, however, data portability may have a limited effect without interoperability. For example, while a user may bring their photos from one social media platform to another, they may be hesitant to try a new service unless interoperability allows them to post on the new platform and still reach their friends on the old platform. Similarly, manufacturers of connected devices may be hesitant to implement a new internet-of-things platform supplier if it will mean losing the connection with the installed user base on older devices. Thus, switching and multi-homing in the presence of significant network effects may only be desirable with significant interoperability.

There may be limited situations in which interoperability of functionality adds value to users without the transmission of user data. For example, a service could, thanks to interoperability standards, run an algorithm directly on a digital platform's server without needing to transfer the underlying data (Cabral et al., 2021, p. 22_[8]). However, in many situations interoperability will require data portability as well.

Some additional considerations suggest that data portability measures could be focused on:

- **Services for which individual-level data provide the most value:** For instance, Fletcher (2020, p. 4_[15]) notes that for targeted advertising, individual level data will be the driver of value. However, data portability at the individual level may have a minimal impact for other services driven by large volumes of aggregate data, such as mapping services that provide estimates of travel time based on real-time journey data.
- **Data held by incumbents without significant costs or investments, in order to manage the burden of firms subject to these measures, or data acquired due to first-mover advantage,** since market contestability may be limited in this case (Competition and Markets Authority, 2020, p. 353_[16])
- **Markets in which some competition is already present,** since users will need a service to switch to with their data for the portability to be effective in enabling competition. In particular, the stronger the network effects and economies of scale in data analysis, the more limited competition benefits from individual-level data portability are likely to be (see, for instance, Ramos and Blind (2020_[30])).
- **Data that can be used in clearly defined applications, according to a consistent structure, without the need for additional data to interpret** (Nicholas and Weinberg, 2019, p. 18_[31]). These conditions help ensure data portability focuses on datasets that are likely to be of value to firms receiving the data.
- **Data for which there are not likely to be significant privacy or ownership complexities,** since this may limit the value of data (Nicholas and Weinberg, 2019, p. 18_[31]). For example, user datasets with numerous missing elements because they involve other users' data will be less valuable than situations in which the data used pertains exclusively to the user in question (and thus there is not likely to be missing context).

Similarly, interoperability interventions could be focused on:

- **Services that are not rapidly evolving or highly innovative** (as suggested by the UK CMA's digital advertising markets inquiry (2020, p. 370_[16])) to manage the risks of standardisation for innovation.
- **Specific dominant or gatekeeper firms**, since asymmetric requirements can prevent small firms or new entrants from facing an undue burden that would worsen competition outcomes (Competition and Markets Authority, 2020, p. 374_[16])

Key considerations regarding the use of data portability and interoperability to promote competition

- Digital platforms may exhibit durable market power due to strong economies of scale and scope, network effects, and other factors leading to user lock-in.
- Data portability can address the switching costs that users face when using a new platform, whether they are switching platforms or multi-homing across multiple platforms.
 - This can enhance competition in markets by facilitating new entry and enabling comparison services.
 - However, portability may not be sufficient to enable competition in some markets, and may lead to unintended consequences that enhance incumbent positions.
 - Thus, portability measures may need to be focused on markets where:
 - Individual-level data provide significant competitive value to recipient firms
 - Data are held by incumbents without significant costs or investments
 - Markets in which some competition is already present (thus network effects and data-driven economies of scale do not completely preclude effective competition)
 - The data in question can be used in clearly defined applications
 - The data in question do not involve significant privacy or ownership complexities
- Interoperability is a key aspect of many digital platform services, as it gives users access to a wide range of choices and complementary functionality (for example applications provided on an operating system). However, in some cases interoperability may be limited due to co-ordination problems or anticompetitive strategies by firms.
 - Interoperability measures can therefore promote competition by reducing barriers to entry related to network effects, unbundling, and enabling multi-homing.
 - However, the implementation of interoperability through standards may also risk hampering innovation, imposing burdens on new entrants, and may be of limited effectiveness if users exhibit a low tendency to switch.
 - Thus, interoperability measures could be focused on:
 - Products that are not rapidly evolving,
 - Specific dominant (or monopolist) firms only
- Data portability and interoperability measures may need to be supplemented with additional measures, particularly when the underlying incentives of platform firms continue to raise competition concerns, or when demand-side features of a market may be limiting competition (e.g. due to consumer inertia)).

4. Mechanisms for implementing data portability and interoperability measures

Data portability and interoperability measures have been implemented through competition law enforcement, competition authority market investigations, sector-specific regulation and other broad-based regulation. These mechanisms can exhibit differences in terms of the design of measures, their scope, and the objectives for which they have been imposed.

As set out above, data portability and interoperability can be used to address competition problems in markets. However, these measures may be motivated by other objectives, including promoting innovation more broadly, and protecting privacy (Swire, 2020^[26]). Data portability can, for example, promote competition by reducing switching costs and promote privacy by giving users the ability to better control their data (Riley, 2020, p. 96^[21]).

These different objectives can, however, sometimes conflict with one another. As noted above, the design of these measures could, for example, lead to questions about the protection of intellectual property rights, particularly if the data to be shared or APIs to be offered involve trade secrets or other protected information (Graef, Husovec and Purtova, 2018^[5]). In addition, expansive interoperability requirements imposed to promote competition may lead to concerns about data protection. By contrast, in some markets data portability (which is by definition user-led) may have a minimal effect on competition (e.g. when only static portability is required, or when only multi-user datasets are likely to be useful by entrants), but could still be desirable from a privacy policy or consumer protection perspective. The design of portability or interoperability measure will therefore benefit significantly from the clear identification of an objective, and a conscious balancing exercise when they conflict. Some commentators have also highlighted the risk of data portability becoming a goal in itself, without a justification in terms of competition, privacy, or another objective (Graef, Husovec and Purtova, 2018, p. 1398^[5]). Co-operation among different regulators and policymakers, and indeed among authorities in different jurisdictions, will therefore be crucial in clarifying potential trade-offs and informing this balancing exercise.

The scope of these measures may also vary significantly according to the mechanism through which they are imposed. Competition law enforcement interventions will be aimed at addressing specific instances of misconduct or mergers, and therefore data portability or interoperability requirements may be imposed only on certain firms in defined markets. However, enforcement can also dissuade other firms from employing similar strategies. Competition authority market investigations (for those authorities with the power to undertake them) will have a sector-wide focus, and may be aimed at addressing structural problems. Broader regulatory approaches can have a wider reach, while still imposing varying obligations on firms, for instance according to their size (with lighter obligations on small firms) or their “gatekeeper” status, although the precise parameters may well differ from competition enforcement focused on market power.

4.1. Competition law enforcement

When a market is not subject to a specific portability or interoperability regulation, for example through sector regulation, competition enforcement may nonetheless result in the imposition of these measures in certain cases.

Competition enforcement remedies that include data portability and interoperability measures will address a specific practice, dataset or functionality in a defined set of markets. These measures focus on a particular set of firms with durable market power (or a dominant position, depending on the jurisdiction), or on the specific firms undertaking a merger under review. For this reason, some have suggested that competition enforcement is the optimal mechanism for imposing interoperability and portability measures, since it can be (1) focused on promoting competitive markets and consumer welfare and (2) limited to dominant firms, which avoids imposing undue burdens on small firms and new entrants (see, for example, Graef et al (2018, p. 1363^[5]) and Engels (2016, p. 10^[25])). Further, competition authorities may find portability, and particularly interoperability remedies to be an alternative to structural remedies (or a merger prohibition) that preserves the benefits of vertical integration or conglomerate business models (Crémer, de Montjoye and Schweitzer, 2019, p. 125^[11]). However, as noted in Section 3. , portability and interoperability may not on their own be sufficient to promote or protect competition in a market. In fact, these remedies may in some cases only be effective if combined with other measures, potentially including divestitures (Kades and Scott Morton, 2020, p. 2^[47]).

Further, there may be significant downsides to using competition law as the mechanism for implementing data portability and interoperability measures. In particular, the development of the legal, technical and procedural aspects of these measures may be particularly complex, as will be their monitoring. The imposition of these remedies under competition law may also involve various legal challenges, including lengthy procedures which will limit their effectiveness in fast-moving digital markets (Krämer, Senellart and de Stree, 2020, p. 80^[7]).

The European Commission's Expert Panel on Competition Policy for the Digital Era opined that the competition law approach should be reserved for situations in which data transfer arrangements or APIs can be standardised, according to stable conditions (Crémer, de Montjoye and Schweitzer, 2019, p. 107^[11]). When this is not the case, the report suggests that a regulatory approach be taken. However, competition law enforcement remedies may also have the advantage of flexibility, in particular through measures that are time-limited and subject to re-assessment as the market evolves.

4.1.1. Abuse cases involving the degradation of portability or interoperability

The most straightforward application of these measures would be in an abuse of dominance (or monopolisation) case where a dominant firm has decided to limit the degree of data portability or interoperability associated with its product. In these cases, portability or interoperability lie at the centre of the theory of harm.

Interoperability theories of harm

Interoperability has been a focus of a small number of abuse cases. For example, the issues investigated by the US Department of Justice and European Commission in their cases against Microsoft related to the degradation of interoperability with third-party products (summarised further in Box 3 below).

Box 3. Interoperability concerns in the US and EU Microsoft Cases

US Department of Justice Case

In 1998, the US Department of Justice filed a complaint against Microsoft alleging that it engaged in anticompetitive conduct to exclude its competitor Netscape from the internet browser market, and to protect its dominant position in the market for personal computer operating systems. The complaint focused on several Microsoft strategies employed at the time, namely:

- Requiring PC manufacturers to preinstall Microsoft's Internet Explorer browser as a condition of obtaining licenses for the Windows operating system
- Tying Internet Explorer to Windows by making uninstallation of Internet Explorer difficult
- Requiring PC manufacturers to adopt a uniform boot-up sequence and desktop screen that prevented manufacturers from giving prominence to competing internet browsers
- Conditioning the inclusion of internet service providers on lists provided to Windows users on those providers distributing Internet Explorer primarily or exclusively (and refraining from promoting rival browsers).

Following the complaint, in a finding of fact, the US District Court also noted that Microsoft delayed providing a crucial API to Netscape, although interoperability limitations were not a major theme of the Department of Justice complaint.

In a settlement approved by the Court in a final judgment in 2002 (and later renewed with modifications), Microsoft agreed to a range of conditions regarding business practices and technical arrangements. With respect to interoperability, Microsoft agreed to disclose to manufacturers, software and hardware vendors as well as internet service providers, the APIs and related documentation needed to interoperate with Windows.

Sources: US V. Microsoft Corp., Civil Action No. 98-1232 (Antitrust), Complaint, 18 May 1998, <https://www.justice.gov/atr/complaint-us-v-microsoft-corp>; US V. Microsoft Corp., Civil Action No. 98-1232, United States District Court for the District of Columbia, Findings of Fact, 5 November 1999, <https://www.justice.gov/atr/us-v-microsoft-courts-findings-fact#vb/>. US V. Microsoft Corp., Civil Action No. 98-1232, United States District Court for the District of Columbia, Final Judgment, 12 November 2002, <https://www.justice.gov/atr/case-document/final-judgment-133>.

European Commission Case

The European Commission's investigations involving Microsoft also considered bundling of Windows with software (specifically the Windows Media Player). However, the case included another element in response to a 1998 complaint from Sun Microsystems in which interoperability was a central theme. In particular, Sun Microsystems alleged that Microsoft abused its dominance by withholding technical information needed to be able to provide certain software for networking computers (work group server operating system).

In a 2004 decision, the Commission found Microsoft had abused its dominant position by refusing to supply this technical information. The decision ordered Microsoft to provide complete and accurate specifications for the protocols used by Windows work group servers, and that this information be provided in a timely manner subject to reasonable and non-discriminatory terms. The decision specifies that any remuneration charged for access to this information should not reflect "strategic value" stemming from Microsoft's market power, should not restrain innovation or create disincentives to compete with Microsoft, and should be sufficiently predictable to enable investments. The arrangements brought forward by Microsoft to comply with this order were market tested, and their implementation was overseen by a monitoring trustee selected by the Commission.

Sources: European Commission, Case COMP/C-3/37.792 Microsoft, Commission Decision, 24 March 2004, https://ec.europa.eu/competition/antitrust/cases/dec_docs/37792/37792_4177_3.pdf; European Commission, Press Release: Competition: Commission to market test new proposals from Microsoft on interoperability, 6 June 2006, https://ec.europa.eu/commission/presscorner/detail/en/IP_05_673; European Commission, Press Release: Commission appoints Trustee to advise on Microsoft's compliance with 2004 Decision, 5 October 2005, https://ec.europa.eu/commission/presscorner/detail/en/IP_05_1215.

Degradation of interoperability cases could conceivably be structured around **refusal to supply** theories of harm in some jurisdictions, although this will only apply in a subset of cases, and would likely involve considering the implications for intellectual property protection, to which APIs may be subject. However, this approach has been taken by the European Commission in the Microsoft case described above. In Europe, these interoperability cases would fall under the stringent conditions established for refusal to license cases, including that the input is indispensable, and the refusal must have prevented competing products from being introduced or sold (see, for instance Squitieri (2012^[48])).

Alternatively, the degradation of interoperability could be the means for implementing a **bundling strategy**. For example, a dominant digital platform that competed with third parties for the supply of a given product via the platform could change its API so that it is compatible only with its own product, effectively bundling the platform and the complement together and foreclosing competitors from the market. In the event that this conduct is found to have harmed consumers (which will depend on the conditions of the market, as set out in OECD (2020^[24])), it will at least be straightforward to identify potential remedies. In particular, the feasibility of interoperability will have been established by past business and technical arrangements.

However, while past interoperability arrangements can be used as a starting point in their analysis, competition authorities will still face the challenge of assessing whether there have been changes in the market or products that could justify the changes to APIs and terms of access. Making this determination will be closely linked to the overall assessment of harm in a case, and may involve some complex trade-offs. For example, a digital platform seeking to improve its privacy and data security may reduce interoperability with third parties (Nicholas and Weinberg, 2019, p. 8^[31]) to address the risk of third-parties misusing users' personal data without consent. Competition authorities will thus be faced with determining whether such a decision is justified. There is also the risk that these alternative concerns like privacy could be used as cover for anticompetitive strategies – particularly in cases where these concerns can be addressed through means other than a degradation of interoperability.

Dominant firms can also degrade interoperability to try to minimise multi-homing by users and increase switching costs. These strategies can be considered similar to **exclusivity clauses**, as they foreclose smaller competitors that could meet only some of a user's needs, for instance. One example of this type of strategy is the conduct investigated by the US Federal Trade Commission involving Google's advertising platform, AdWords. Specifically, Google provided advertisers with APIs to directly access the AdWords platform in order to monitor and manage their advertising campaigns. The FTC reached an agreement with Google to remove contractual conditions that limited the ability of advertisers using AdWords APIs to manage their campaigns on other advertising platforms (Federal Trade Commission, 2013^[49]). Notably, these revised terms were retained by Google after its legal obligations expired, which some attribute to the success of the agreement in promoting the growth and development of online advertising markets (Riley, 2020, p. 100^[2]). The European Commission has also opened investigations into alleged anticompetitive refusals by Apple to enable interoperability, namely: granting only Apple Pay access to NFC technology for payments on iPhones and iPads (i.e. refusing access by third-party payment applications), and requiring applications available on the app store to use Apple's payment system (while restricting the ability of applications to inform users of alternative purchasing options) (European Commission, 2020^[50]; European Commission, 2020^[51]).

Finally, in those jurisdictions in which they are considered, **exploitative abuse of dominance** theories of harm may be of relevance to both portability and interoperability concerns. In particular, degrading interoperability or portability could be considered equivalent to the imposition of unfair terms on users by dominant firms. While it can be challenging to determine exactly what constitutes an unfair term, some competition authorities have made use of exploitative abuse of dominance provisions to address concerns about conduct in digital markets (OECD, 2020, p. 52^[52]).

Portability theories of harm

With respect to data portability, a digital platform may change its terms or functionality in order to limit the ability of users to take their data from the platform and use it on another. If these arrangements were in place previously, a change in portability could undermine the viability of firms offering products that rely on ported data from users, whether these products are substitutes or complements to the digital platform in question. It is not clear whether such a degradation in data portability would constitute an abuse of dominance (or attempt to monopolise).

One potential approach could be to consider degradations in data portability to be a **margin squeeze strategy** when they affect downstream competition. For example, a digital platform may seek to make the continuous porting of data to new complementary services more difficult in order to effectively tax downstream rivals.¹⁶ However, this approach implies that the digital platform has market power over the supply of data used as an input for the complementary service. This would not apply if alternative data sources were available, or if the data were not an important input for the feasibility and attractiveness of the service.

Alternatively, a degradation of data portability that would be needed for complement products could be considered as a strategy for offering a **bundle discount** on the platform's core product and the complement. For instance, data entry and sharing by a user could be considered a part of the price for using the service, and the ability to seamlessly share it with a complementary service could be considered a discount (relative to competing complements that would not feature this functionality). In certain specific situations, bundling can be a strategy for leveraging market power and foreclosing competitors (OECD, 2020_[24]). Such an approach could for example be part of an envelopment strategy, in which data access is used to enter related markets, since limiting data portability may be one strategy of preserving the platform's competitive advantage (see, for instance, the privacy policy tying theory of harm of Condorelli and Padilla (2019_[22])).

When the degradation of data portability relates more to switching or multi-homing behaviour by users (namely when the data is to be ported to rival digital platforms, rather than complementary services), the picture becomes more complex. Considering a degradation of data portability as tantamount to **input foreclosure or a refusal to supply** is likely to involve numerous challenges. Perhaps the most significant such challenge to this approach is that portability only concerns the data of those users who choose to use this option, and so it would be difficult to consider portability limitations as equivalent to denying access to a broader dataset that is an essential input to be able to compete in the market. Further, a degradation of static data portability may also not fit within an essential input framework, given the importance of dynamic data flows in many digital platform markets.

However, some recent commentary has recommended that particular attention be paid to these situations. For instance, the expert panel commissioned by the European Commission on Competition Policy for the Digital Era has suggested that strategies by firms to impede multi-homing and switching should generally be "suspect" (Cr mer, de Montjoye and Schweitzer, 2019, p. 6_[11]). Specifically, the report recommends that the burden should be on dominant firms restricting multi-homing to demonstrate the efficiencies associated with these actions. As with interoperability, **exploitative abuse theories** may also apply to degradations of data portability.

Remedies to address the degradation of data portability or interoperability

The nature of remedies applicable to this conduct will generally be clear – a firm found to have engaged in abusive conduct will be required to cease the conduct, for example by restoring interoperability or data portability. In contrast to access remedies, data portability remedies have the significant benefit that they can be less-intrusive and potentially less legally-burdensome to impose, although interoperability remedies may not (OECD, 2018, pp. 105-106_[14]). The imposition of data portability could thus be an alternative

approach to mandating the provision of data access to competitors, which would involve significant conceptual and legal hurdles associated for example with the application of the essential facilities doctrine (OECD, 2016, pp. 21-22^[20]). These challenges include the need to demonstrate the essential nature of a dataset to compete and the lack of alternatives (Krämer, Senellart and de Streel, 2020, p. 26^[7]).

Authorities may need to contend with claims from the infringing firm that the change in interoperability or data portability was justified, for example by privacy, security, or the implementation of new technologies, features or product versions. For example, mobile application stores review new applications for policy violations such as fraud, which could even demonstrate competition across stores over trustworthiness (Riley, 2020, p. 101^[2]). However, if it is deemed that such justifications are not sufficient relative to the impact of portability or interoperability restrictions on competition (or that their purposes can be achieved without degrading portability and interoperability), authorities can at least be certain that the remedy will have an impact on competition, since it will involve ceasing conduct that has harmed competition. As noted above, the timing of these remedies will be key, since a significant delay may result in a market already “tipping” to monopoly, for example, in which case entry barriers could make it difficult to restore competition once it is lost.

While the selection of remedies will be relatively simple in these cases, they will still involve some of the fundamental challenges associated with behavioural remedies – namely that they mandate conduct that goes against the target firm’s economic incentives, thus requiring oversight (OECD, 2019, p. 33^[53]), discussed further in Section 5.3.15.3.1

4.1.2. Merger cases considering the risk of a degradation in portability or interoperability

Theories of harm with respect to both vertical and conglomerate mergers both centre around the potential for future anticompetitive conduct enabled by, or more likely as a result of, the merger. Thus, mergers involving digital platforms can be scrutinised for the risk that they give rise to the conduct described above. Specifically, an investigation can determine whether the merger will lead to:

- Vertical integration involving digital products that must be able to communicate with one another in order to function, and the post-merger firm will have durable market power with respect to at least one product
- Vertical integration involving digital products, one of which requires data input from the other in order to be viable, and the post-merger firm will have durable market power with respect to at least one product
- Bringing together complementary products or products with overlapping users bases which could use each other’s data or communicate with one another, and the post-merger firm will have durable market power with at least one product

In these cases, behavioural remedies could address the risks of anticompetitive strategies to degrade portability or interoperability, given the incentives the post-merger firm may have to leverage its market power (and the ability to do so conferred by the merger). Box 4 below describes several mergers reviewed by the European Commission in which portability and interoperability featured as a possible theory of harm, remedy, or both.

Box 4. Data portability and interoperability concerns in European Commission merger reviews

The European Commission has considered data portability and interoperability-related theories of harm in several merger cases related to digital platforms.

Interoperability theories of harm

Most recently, the Commission approved the **Google/Fitbit merger** in 2020, after Google made an interoperability commitment to address the Commission's concerns. Specifically, Google committed to maintain the Fitbit API that provided access to users' data through software applications, without charging for access.¹⁷

The Commission's review of a **joint venture between Daimler and BMW for car-sharing services** in 2018 considered potential competition concerns associated with interoperability. In particular, the Commission's analysis noted that the parties to the joint venture could leverage their position in the car sharing market and foreclose competing providers of multi-modal transportation aggregation applications by limiting interoperability (needed for the parties' car-sharing services to appear on the aggregation applications). BMW and Daimler's car sharing fleets were deemed "must-haves" for these applications, which integrate several different transportation options.¹⁸ The Commission approved the joint venture subject to a commitment by the parties to make their APIs available to multi-modal transportation applications on a non-discriminatory basis, upon request and subject to certain conditions for 3 years following the transaction. These conditions set out procedures for access, a fast-track arbitration procedure, and the scope of firms to which access would be granted. For example, they state that the API "does not need to be made available to large technology companies using data in the area of mobility services (like car sharing and ride hailing) or in the areas of data analytics and/or autonomous driving."¹⁹

Foreclosure concerns were also a feature of the European Commission's review of the **Microsoft/LinkedIn merger** in 2016. In particular, the Commission found that Microsoft could foreclose LinkedIn's rivals by pre-installing a LinkedIn application on Windows operating systems, or integrating LinkedIn into Microsoft productivity applications while refusing to provide LinkedIn's rivals with the APIs necessary for such integration. The transaction was approved subject to various commitments, which include non-discrimination in the Microsoft application store and refraining from pre-installing LinkedIn on computers running Windows. Most relevant from an interoperability perspective, the parties committed to make Microsoft Outlook APIs on a non-discriminatory basis (subject to standard terms) to third party professional social networks.²⁰

Interoperability concerns have also arisen in high-technology markets other than digital platform markets. For example, the Commission reviewed two mergers of chip manufacturers (**Broadcom/Brocade**²¹ in 2017 and **Qualcomm/NXP**²² in 2018) in which there were concerns of anticompetitive leveraging through a degradation of interoperability. Both mergers were cleared subject to commitments by the parties to maintain interoperability with third parties.

Data portability theories of harm

In its 2014 review of the **Facebook/WhatsApp merger**, the European Commission considered the degree to which data portability limitations would hamper consumer switching, with implications for competition. In this case, the Commission found that data portability would not play a significant role, given the ease of porting contacts and a view that instant messaging history would "not necessarily carry long-term value for consumers."²³

Horizontal mergers could be associated with a degradation of interoperability and portability in different ways. First, a horizontal merger that involves at least one vertically integrated or conglomerate firm could enable and incentivise the anticompetitive degradation of interoperability. This would occur if the merger gave rise to market power in one of the markets, thus enabling its leveraging into other markets. Second, a horizontal merger may lead to the degradation of data portability and a specific effort to increase switching costs for users. In particular, this would be the outcome if the transaction relieved the merging firms of sufficient competitive pressure to enable them to degrade data portability without fearing a consumer or competitor response. Thus, an anticompetitive horizontal merger could enable further anticompetitive conduct in the form of increasing user switching costs. In both of these instances, a structural remedy may be the only tool available to addressing the risks of anticompetitive conduct associated with portability and interoperability. However, data portability has been considered as a horizontal merger remedy, for example in the US Department of Justice’s review of the Ticketmaster/Live Nation merger, as described in Box 5 below.

Box 5. The Ticketmaster/Live Nation merger

In January 2010, the US Department of Justice required both structural and behavioural remedies to clear the proposed merger between Ticketmaster Entertainment, the world’s largest ticketing company, and Live Nation, the world’s largest promoter of live concerts and – at the time of the merger – a recent entrant in the market for ticketing. Therefore, the merging parties were both active in the market for primary ticketing of major concert venues, i.e. services provided to venues or other customers to enable the sale of tickets for events and the validation of tickets at the venue.

Among the remedies, the US Department of Justice required the merged entity to provide ticketing clients with their “ticketing data” (including data on number of tickets sold, proceeds from those sales, ticket inventory, pricing, marketing and corresponding sales) and “ticket buyer data” (including non-public identifying information for ticket buyers) to allow any client that chooses to use another primary ticketing service provider to obtain a copy of its data. In particular, if any client of primary ticketing services chooses not to renew a contract with the merging parties in effect prior to the merger, the latter are required to provide the client with a complete copy of all client ticketing and ticket buyer data within 45 days and “in a form that is reasonably usable by the client”.

These provisions were set to expire on 30 June 2020. However, an amended final judgment was issued on 28 January 2020 extending the duration to 31 December 2025. The amendments introduced in 2020 also aim at ensuring more effective compliance with the remedies imposed, prescribing for instance the appointment of an independent monitoring trustee.

Source: US Department of Justice, Press Release: Justice Department Requires Ticketmaster Entertainment Inc. to Make Significant Changes to its Merger with Live Nation Inc., 25 January 2010, http://www.justice.gov/atr/public/press_releases/2010/254540.htm; Final Judgment, U.S., et al. v. Ticketmaster Entertainment, Inc., et al., No. 10-cv-00139 (D.D.C. 30 July 2010), <https://www.justice.gov/atr/case-document/final-judgment-180>; Amended Final Judgment, U.S., et. Al. v. Ticketmaster Entertainment, Inc., and Live Nation Entertainment, Inc., No. 1:10-cv-00139 (D.D.C. 28 January 2020), <https://www.justice.gov/atr/case-document/file/1241016/download>.

4.1.3. Collusion cases involving interoperability

Limitations to interoperability may also be the result of co-ordination among competitors in a market. Agreements to limit interoperability with new entrants can serve to reduce market contestability and protect incumbents. For example, the European Commission began an investigation in 2011 into an initiative by the European Payments Council to standardise online payments. The Commission was concerned that the agreement may have constituted a restrictive practice that excluded new entrants or payment providers

not controlled by a bank (European Commission, 2011^[54]). The standardisation initiative was discontinued after the investigation was opened, and the Commission indicated it would continue to monitor the market (European Commission, 2013^[55]).

However, limitations to portability and interoperability are not the only potential collusion risk – a high degree of data portability or interoperability in a market could also facilitate collusion among firms in a market. Interoperability, like all standard-setting processes, may disincentivise aggressive competition on the parameters covered by the standard, and may be used as cover for information exchange or otherwise facilitate collusion. Data portability may increase the risk of collusion due to a higher degree of transparency in a market (see, for example, OECD (2017^[56])). However, the degree to which this transparency is achieved will depend on the proportion of users that transfer their data.

4.1.4. The use of portability and interoperability remedies in other enforcement cases

There may be cases in which data portability and interoperability could play a role in addressing competition problems even if the theory of harm is not centred around the degradation of pre-existing interoperability or portability. As described above, data portability measures can be a means of addressing switching costs and user lock-in, as well as the structural features of data-intensive markets that may lead to durable market power (namely economies of scale and scope). Interoperability can encourage contestability in markets that feature strong network effects, or where different products with overlapping user bases may be bundled or tied together. Thus, these measures could be indirect solutions to addressing abusive conduct or potentially anticompetitive mergers more broadly. Selecting cases in which they would be appropriate remedies may not be straightforward, however.

First, these remedies may be of interest as a broad measure to address competition concerns by increasing competitive pressures in a market. For instance, the ability of a dominant firm to employ an anticompetitive strategy may be disciplined somewhat by the increased threat of competitor or user responses enabled by easier switching or multi-homing. However, there is also a risk of unintended consequences if these remedies are not designed carefully, namely that these measures could risk inhibiting competition (as discussed above).

Further, it may be challenging to establish whether portability or interoperability remedies can be helpful in restoring pre-infringement competition when an infringement does not involve a degradation of portability or interoperability (remedies generally seek to restore the situation in a market prior to an infringement, although competitors harmed by misconduct may seek broader remedies). For example, in the US Department of Justice's Microsoft case regarding limitations to interoperability, plaintiffs sought remedies that went beyond eliminating a given anticompetitive conduct to include efforts to obtain what they claimed would have been their market share but-for the infringement. This request was denied by the court given the uncertainties associated with establishing a but-for benchmark in a rapidly evolving market (Kathuria and Globocnik, 2020, p. 516^[57]).

Secondly, these remedies can be aimed at preventing the emergence of market power in the context of a merger, by putting in place conditions to keep markets contestable. For horizontal mergers, this may not be sufficient given the limitations and risks of ineffectiveness associated with these remedies. Thus, prohibitions and structural remedies may be needed, although interoperability or portability could be effective supplements, in particular to ensure divestments achieve their purpose (e.g. to address concerns about access). However, in cases with potential vertical or conglomerate harms, interoperability and portability could be used to address future foreclosure and market power leveraging risks – particularly if an agency has competition concerns but may not be able to successfully prohibit a merger.

Third, these remedies may be a strategy for addressing competition concerns stemming from a merger that brings together datasets or networks to produce a competitive advantage that translates into durable market power. In particular, data portability may help address competition risks from a merger involving

important datasets by improving competitor access to this data. As noted above, data portability will only give competitors access to the data that users choose to take with them, meaning that switching costs may be reduced but the advantages associated with a large accumulated set of user data may not be fully addressed.

In a similar vein, interoperability measures could be used to address concerns about insurmountable network effects stemming from a merger, whether horizontal, vertical or conglomerate. Market contestability could be encouraged, and barriers to entry eased, if users do not risk losing their connections when moving to new services or multi-homing. The effectiveness of interoperability remedies will, however, depend on the significance of the advantage conferred by the combined networks, as well as other potential sources of market power, including a low propensity of consumers to shop around and switch. In such instances, authorities may prefer a focus structural remedies, and potentially consider interoperability measures as an additional strategy to promote competition in the post-merger market.

When a competition authority is seeking to address competition problems that do not specifically relate to a decision to degrade interoperability, the selection and design of interoperability measures may be particularly complex. In other words, without the ability to refer to past legal and technical interoperability arrangements, competition authorities will need to consider whether such interoperability is feasible, can be monitored and is likely to promote competition. The precise market or market segments to be involved will need to be selected as well when trying to address concerns about bundling or margin squeeze strategies. For example, if a competition authority has concerns about the leveraging of market power by mobile device operating system providers over application markets, should interoperability be aimed at ensuring access to application stores, or to enable competing application stores to function on the operating system? Box 6 below sets out one potential approach to analysing these issues in the context of internet-of-things technologies and vehicle manufacturers.

Box 6. Considering interoperability in the context of connected vehicles

Kerber (2019^[36]) describes the potential issues that may arise when connected vehicle manufacturers limit interoperability of a vehicle's systems with third-party services. The paper considers a competition enforcement approach to encouraging system openness in the event other regulations are not put in place to achieve competitive markets for complementary connected vehicle services. Such a proposal, in contrast to the discussion in Section 4.1.1 would involve the creation of new interoperability arrangements rather than simply addressing the deterioration of previously existing interoperability.

Vehicle manufacturers effectively play a gatekeeper role between consumers and a large and growing array of third-party services enabled by connected vehicle technologies. These include navigation, entertainment, search services (e.g. to find nearby restaurants), driver behaviour tracking (e.g. for vehicle insurance purposes) and performance analysis (e.g. to conserve fuel), among others. Manufacturers may opt to develop their own versions of each such service without enabling third-party alternatives, effectively bundling a vehicle with these complementary services – referred to as the “extended vehicle” concept.

While bundling can be beneficial for consumers, the paper suggests that in the case of connected vehicles, bundling may lead to lower consumer welfare given the durability of vehicles and resultant lock-in as well as switching costs (which could limit competition between different manufacturers' systems of connected vehicle services) (Kerber, 2019, p. 387^[36]). Thus, the paper suggests that competition enforcement can play a role in enabling connected vehicles to operate as open systems

To assess dominance, Kerber proposes defining markets for data or product ecosystems for each vehicle manufacturer, and considering whether the manufacturer is leveraging their power in these markets in order to foreclose competition for connected vehicle services (p. 398^[36]). This approach

seeks to recognise the position conferred to vehicle manufacturers in the market for complementary connected vehicle services given consumer lock-in. Alternatively, the paper notes other concepts that could apply to behaviour below the threshold of a dominant firm, such as “relative market power” (over third-party service providers that may be locked in to a manufacturer’s system) (pp. 407-408^[36]).

Kerber notes that manufacturers may discourage openness of connected vehicle systems to third parties on safety grounds (p. 382^[36]). However, the paper suggests that safeguards can be put in place through, for example, a “shared server” governed by a neutral entity providing non-discriminatory access to data and standardised interfaces for access to vehicle systems (p. 390^[36]).

Finally, Kerber concedes that the imposition of interoperability when none currently exists may be challenging under existing abuse of dominance frameworks. However, the paper notes that some less demanding remedies may still promote competitive product ecosystems, such as requiring vehicle manufacturers to develop safety systems enabling the use of third party connected services (p. 405^[36]).

4.2. Other competition authority tools

Competition authorities may seek to promote data portability or interoperability beyond the context of an enforcement action or merger review. One potential method is advocacy with policymakers to highlight a particular issue. For example, the Study Group of the Japan Fair Trade Commission published a Report on Data and Competition Policy which indicates the role that data portability could play as a regulatory measure (Japan Fair Trade Commission, 2017^[58]).

Market studies can be an effective tool for competition authorities to advocate for portability and interoperability when they have procompetitive potential. In particular, a market study can seek to identify some of the competition issues stemming from a lack of portability and interoperability, namely user lock-in and switching effects, barriers to entry stemming from network effects, and significant economies of scope accompanied by market power, among others. It may also gather information on industry structure, and incorporate insights from potential entrants about whether data portability or interoperability would help facilitate entry and competition. The UK Competition and Markets Authority has published a market study on online platforms and the digital advertising market, which recommended that new digital regulatory functions include the ability to impose interoperability, as described further below in Section 4.3.4

Some jurisdictions have further powers to implement remedies through a market investigation process. For instance, the Open Banking reforms in the UK described further in Section 4.3.2 below were imposed through a market investigation. Remedies developed through these tools will require careful design and monitoring mechanisms, however, as any static measures may need to be updated or subject to review (Digital Competition Expert Panel, 2019, p. 79^[59]).

4.3. Ex ante regulation

Data portability and interoperability measures have also been implemented through new regulatory frameworks. This approach may be particularly relevant when the measures require a significant degree of oversight, monitoring and adjudication over disputes, or when they seek to incorporate objectives in addition to competition. Legislation may also be needed to implement some measures that go beyond what a competition authority could order, for example if there is a desire to assign ownership rights to consumers over a defined set of their data (Zingales and Rolnik, 2017^[40]). Further, it may be preferable to address potential competition concerns associated with portability and interoperability through legislation if there is a concern that competition enforcement proceedings will take too long to have a beneficial impact in the market (Kerber, 2019, p. 406^[36]). Further, ex-post portability and interoperability remedies imposed in

response to competition law infringements may come too late to have an impact, and may have limited broader impact on market participant behaviour if they are highly dependent on the specific facts of a case.

In addition, a regulatory approach can ensure a broader approach to the implementation of portability or interoperability measures, for example beyond conditions imposed on the parties to a merger. Such harmonisation could facilitate international co-operation in the development of standards, particularly important given the broad geographic scope of many digital platforms (Gal and Rubinfeld, 2019, p. 759^[13]). Sector- or market-specific regulation can also ensure that specific requirements are tailored to the specific relationships and actors in a market. At the same time, regulatory approaches may need to adopt an approach similar to competition law enforcement by focusing on specific firms to ensure they do not place an undue burden on new entrants, or in fact unintentionally strengthen the position of incumbents by for example entrenching a given technology. The ability for competition enforcement remedies to be designed with flexibility and regular review processes may also be a feature worth replicating in ex-ante portability or interoperability regulation.

The sections below illustrate several examples in which portability and interoperability measures have been implemented, or have been proposed, through regulatory means in markets involving digital platforms. These include both horizontal (data protection) and sector-specific (open banking or digital sector) approaches.

4.3.1. Data protection legislation

Data portability focused on personal data has been included in data protection legislation in Australia (currently applicable to the banking sector only)²⁴, California²⁵, and the EU,²⁶ and is being considered in the context of data protection reforms in Chile (Bobadilla and Silva, 2017^[60]) and Korea (Park, 2020^[61]). These provisions are rooted in the objective of providing data subjects with greater control over data collection (framed as a fundamental right in the EU (Krämer, 2020, p. 2^[35])), and in the case of California and Europe are complemented with other rights such as a right to request deletion of personal data (see, for instance, Engels (2016, p. 2^[25])).²⁷

Given the data protection focus of these measures, they may have a varying impact on competition. As noted in Section 3. above, greater data portability can reduce switching costs in some markets and may enable new entry. However, the competition benefits of data portability measures may also be limited by data protection legislation. For instance, data protection legislation could result in limitations to a user's ability to port their data to a new service if their dataset includes the personal information of other users. This could mean that a user could for instance port their replies to a connection's social media content, but not the original post made by another connection, unless the connection consented to the transfer of their data (Krämer, Senellart and de Streel, 2020, p. 6^[7]). As such, the competitive value of data ported subject to these limitations may be minimal, depending on the context.

Beyond their objectives, the specific design of data protection-focused data portability measures will have a significant bearing on the impact on competition, whether positive or negative. First, the scope of these measures in terms of the entities they include matters. For instance, the EU's General Data Protection Regulation (GDPR) applies broadly to "data controllers" regardless of their size or whether they earn profits, whereas the California Consumer Privacy Act (CCPA) focuses on for-profit businesses earning annual gross revenue in excess of USD 25 million which derive 50% or more of their revenues from the sale of consumers' personal information (Marini et al., 2018^[62]). Some have expressed concerns that blanket data portability requirements may limit the benefit of these measures for competition, as they may impose costs and require new entrants to share all of their data, potentially strengthening incumbents (Swire, 2020^[26]). Notably, GDPR imposes fewer requirements on small- and medium-sized firms, although Gal and Aviv suggest this may limit the ability of these firms to transact with larger firms subject to heavier requirements (2020, p. 3^[33]). Thus, if smaller firms need to obtain data from larger firms, they may nonetheless need to comply with the more stringent and costly requirements. In addition, data protection

legislation while it can foster trust and thus the use of innovative services, may also unintentionally hamper the ability of new firms and innovative business models to contest markets, for instance if they (per Gal and Aviv (2020, pp. 4-5,20,22^[33]):

- Prohibit or restrict certain data collection methods used by entrants to catch up to incumbents
- Create disincentives to share data, and to acquire data from external sources due to difficulties in obtaining consent, thus increasing first-mover advantages for firms that already possess data. This may lead to greater market concentration and market power extending across multiple markets for which the data serve as a valuable input.
- Provide incumbents with a justification for limiting data access to rivals.

Second, the range of data covered by data portability requirements can also affect their utility in promoting competition. For instance, GDPR can be interpreted as covering provided and observed data (Krämer, Senellart and de Streel, 2020, p. 20^[7]). This could be an attempt to mitigate conflicts with intellectual property protections that could arise were inferred data to be included, for example (Graef, Verschakelen and Valcke, 2013, p. 1373^[63]), but may limit the usefulness of covered data for potential entrants. In contrast, the CCPA could also be interpreted as including inferred data about a consumer obtained from third parties (Marini et al., 2018, p. 14^[62]). Further, as noted in Section 3 above, one-off data transfers may be of significantly less relevance for promoting competition than continuous data transfers that would require some level of interoperability not covered in data protection legislation.

Third, there is a question of the means with which data is shared. In an effort to ensure that the data covered under a data portability measure are useful, these provisions may set conditions on the mechanisms and format of transfers. For instance, both GDPR and the CCPA require data to be formatted when provided to consumers (“a commonly used and machine-readable format” in the case of the former and “readily usable” format for the latter) (Marini et al., 2018, p. 34^[62]). This illustrates how many data portability measures will, in order to be effective, need to at least refer to interoperability considerations.

Krämer et al suggest that the effectiveness of GDPR in promoting competition may be mitigated, given that it could be interpreted as requiring only one-off data exports with a substantial (one-month maximum) delay that may affect the usefulness of data (2020, pp. 19, 48^[7]). However, there is also a risk to competition if heavy data formatting and speed requirements are imposed on small entrants, given that the cost of compliance may exhibit significant economies of scale (Gal and Aviv, 2020, p. 4^[33]).

In sum, data protection-focused data portability measures may not always be a multi-purpose tool for effectively promoting competition at the same time. These measures will need to be designed with a clear awareness of likely impacts on market dynamics, as well as potential risks, in order to have a procompetitive impact. This suggests that active competition authority advocacy could play a role in the design of these measures, and helping to identify risks such as the creation of new entry barriers that may worsen competitive conditions. To improve the procompetitive potential of these measures, consideration could also be given to including certain elements, such as: including data portability in the consents users provide for data sharing (to allow one user to share another’s social media posts where the two users interacted, for example); requiring dynamic data portability, including services facilitated by third parties (Krämer, Senellart and de Streel, 2020^[7]); including observed data (such as user clicks) in the scope of data covered by the measures (Krämer, 2020, p. 2^[35]); and even supplementing data portability with additional measures such as sharing of data held by governments on a preferential basis (e.g. to small new entrants) when it can be a substitute for personal data (Gal and Aviv, 2020, p. 36^[33]).

4.3.2. Open banking

The retail-banking sector has been a particular focus of data portability and interoperability initiatives that involve digital platforms. These initiatives have been broadly termed “open banking”, and include both measures imposed by regulation as well as voluntary arrangements between different parties that seek to

share data in order to improve banking services (including those facilitated by third-party intermediaries) (OECD, 2019, p. 4^[64]). They fit within a broader set of policies seeking to promote consumer protection and competition in the financial sector, including with respect to data access.²⁸

Despite recent digital innovations in retail banking, there are signs that competitive intensity in these markets is low. In particular, a minimal level of customer switching has been observed, including in the UK (Competition and Markets Authority, 2016, pp. 267-269^[17]) and the US (J.D. Power, 2019^[65]). For example, prior to the implementation of open banking reforms, the average UK consumer remained with the same bank for 20 years (OECD, 2018, p. 103^[14]). In its market investigation into retail banking, the UK Competition and Markets Authority found that low consumer switching was due to several characteristics of retail banking markets that hampered competition; namely: the lack of prompts (such as contract expiry) to consider alternatives; information and awareness barriers regarding the availability of alternatives (particularly when many consumers could gain from switching); complexity associated with comparing offers; and concerns about the risk of switching providers (2016, pp. 169-169^[17]). Notably, these outcomes persisted despite the existence of switching services that involved data portability (e.g. the ability to transfer established bill payments to a new account).

In response to these concerns, several jurisdictions have introduced regulatory measures aimed at developing open banking, or at least data portability in banking, including Australia (through the Consumer Data Right, or CDR, which now applies to the banking sector), the European Union (through the Payment Services Directive PSD2), the UK (through the Open Banking scheme imposed as a market investigation remedy), and the US (through the Dodd Frank Act). These initiatives vary in terms of their scope, and may reflect differences of views in terms of the degree of standardisation needed in retail banking markets.

For instance, while PSD2 implements data portability requirements (but not full interoperability) for consumer data between certain financial institutions. In a recent report, the Portuguese Competition Authority highlighted poor performance of APIs as one factor limiting the effectiveness of portability under PSD2 in promoting competition (Autoridade de concorrência, 2021^[66]). The UK Open Banking scheme supplements PSD2 portability requirements with interoperability measures and a broader scope of service providers eligible for access, although it applies to a narrower range of banking activities (OECD, 2019, pp. 7-8^[64]).

To implement Open Banking in the UK, the Competition and Markets Authority established the Open Banking Implementation Entity (OBIE), governed by the Authority and funded by the UK's nine largest retail-banking firms. The OBIE has, among other roles, designed APIs to enable interoperability between different service providers.²⁹ The design process included consultations with a varied group of stakeholders, including consumers, incumbents and third party service providers, although the Trustee overseeing the OBIE was granted the ultimate authority to impose decisions when consensus was not possible (Competition and Markets Authority, 2017, p. 64^[67]).

Competition is a core objective of these initiatives, although their implementation will depend significantly on other regulatory frameworks as well, including financial system and data protection rules. In particular, open banking measures focused on data portability seek to ease switching, whereas interoperability measures may have more fundamental effects on competitive dynamics, including leveraging third-party services to encourage competition (OECD, 2018, p. 98^[14]). For example, the UK's Open Banking regime facilitates not just easier switching but also:

- **Multi-homing** by allowing consumers to access all of their accounts and retail banking information through a single platform (whether provided by a third party or a bank), thanks to the common APIs it has instituted.³⁰ Thus, consumers can more seamlessly use multiple providers of a single retail banking service.
- **Shopping around** by enabling comparison tools that help overcome information barriers and complexities that may be impeding competition.

- **Mixing and matching of services**, enabling unbundling of these services (OECD, 2019, p. 15^[64]). For example, a consumer will be able to obtain a loans from one bank, chequing account services from another, and make investments with a third financial service provider, while accessing information for all of these services through a single platform.

Indications regarding the early results of the UK Open Banking initiative are set out in Box 7 below.

Box 7. Results of Open Banking in the UK

The Open Banking Implementation Entity (OBIE), in its February 2021 highlights, reports that the UK financial services ecosystem now has 303 regulated providers, 222 third-party providers and 81 account providers. Of these, 108 regulated entities are currently active in the market. In early 2021, there were one million payments processed in per calendar month, up from 300 000 in the whole of 2019, and 3.2 million payments in 2020. By early 2021, the OBIE reported that more than 3 million people were using open banking-enabled apps and services on a daily basis.

Even so, there are some reports that consumers remain wary of security and the sharing of financial data. Respondents to a survey conducted by the Financial Conduct Authority (FCA) felt that the biggest single barrier to customer uptake was consumer sentiment and awareness. The FCA highlighted two surveys by "Which?" (a monthly consumer magazine), which in 2019 found that only 25% of people had heard of open banking at the time, and those that had, saw a lack of perceived benefits and concerns about data security and privacy as barriers to consumer engagement. Respondents to the FCA's survey indicated that regulation alone is unlikely to be a useful tool in changing consumer preferences or behaviours. Many financial entities called for, and are working on, building compelling use cases to help with continued uptake. It was also suggested that the FCA or the UK government should run a consumer education campaign setting out a customer's rights to share data. Finally it was felt that the implementation of open banking had been technology-led rather than user-led. According to the FCA, these respondents suggested that effective market and consumer research was needed to understand what services people are likely to use.

Sources: OBIE (2021^[68]) and FCA (2021^[69]).

Several parameters must be considered in the design of interoperability measures in retail banking. First, there is the question of where to place limits on access to APIs and consumer financial data, given the consumer and data protection implications. Mitigating these risks may lead to a focus on large, established banking institutions, although some of the benefits of open banking enumerated above may only be achieved if innovative third-party services are able to enter a market. At the same time, concerns regarding systemic risks, for example, may also be used as a pretence by incumbents to resist interoperability initiatives (OECD, 2018, p. 107^[14]). FRAND terms may be useful in ensuring that data protection and other justifications are not used to refuse data or API access for anticompetitive reasons, and indeed have been put in place in some jurisdictions (Swire, 2020, p. 67^[26]).

Second, the design of measures will need to consider the risk of certain unintended consequences on the market. For example, open banking may undermine potentially beneficial commercial arrangements, for example related to exclusive partnerships or data sharing. However, there are questions as to whether the markets for such arrangements are currently functioning to begin with (OECD, 2018, p. 106^[14]). Others have expressed concerns about the emergence of a monopolistic banking platform as a result of open banking, although it is not clear such concerns are justified (OECD, 2018, p. 106^[14]). When considering the potential competition risks associated with the entry of big-tech firms' entry into financial services markets, the Netherlands Authority for Consumers and Markets has recently published a report

emphasising the need to ensure a level playing field for regulation in order to enable innovation in the sector (Authority for Consumers and Markets, 2020, p. 4_[70]).

At the same time, open banking measures will still require the enforcement of competition law to achieve their potential. For instance, banks may react to interoperability requirements with anticompetitive bundling strategies through discounts, or by seeking to acquire emerging competitors (OECD, 2019, p. 18_[64]). Further, with the entry of new large digital players into financial markets, vigilance may be needed regarding potential anticompetitive conduct, including the leveraging of market power by big tech firms into financial services markets (Authority for Consumers and Markets, 2020, p. 4_[70]). Collusion risks will also need to be carefully monitored, as discussed in Section 4.1.3

4.3.3. Other regulatory approaches to promoting data portability

Data portability measures have also been implemented in the context of two other policy objectives. First, policymakers have begun to consider various mechanisms for encouraging data sharing in order to ensure that digitalisation reaches its full potential in terms of economic growth and productivity (see, for example, OECD (2019_[71])). Data portability can play a role in promoting data sharing. For example, the European Free Flow of Data regulation seeks to remove legal obstacles for the portability of non-personal data (European Commission, 2019_[72]), highlighting that competition issues associated with a lack of data portability may be caused not only by firms' conduct and incentives, but also government legislation.

Second, data portability has also been considered in the context of consumer protection objectives and legislation. For example, French legislation passed in 2016 requires online communications services to allow consumers to retrieve their own data within a consumer protection framework.³¹ As with the other approaches described above, data portability measures seeking to enhance data sharing or consumer protection objectives may either promote or hinder competition, depending on their design, warranting cooperation between competition authorities, policymakers, and consumer protection authorities.

A final example is a sector-specific interoperability measure aimed at promoting competition in a particular market. Legislative measures in three US states required an open API and imposed access conditions with respect to automobile dealer management systems. Dealers use these systems for a range of management tasks, with two providers accounting for more than 90% of the market in the US (Swire, 2020, p. 40_[26]). The providers recently began refusing access by third-party software to dealer management systems and data on the grounds of data security, although complaints have suggested that the refusals relate more to limiting competition from third parties. This legislation provides an alternative mechanism to competition enforcement when seeking to address competition concerns relating to interoperability in specific markets,

4.3.4. New interoperability measures regarding digital platforms

Several new interoperability measures have been proposed or implemented through legislation focusing on the digital sector. They fit within a broader set of initiatives to address digital competition issues, aimed at encouraging market contestability and entry while addressing conduct not easily captured under current antitrust law. Notably, these measures consider an asymmetric approach, applying requirements to a specific set of digital firms with market power or gatekeeper positions. This can mitigate the potential risks set out above with respect to creating entry barriers and imposing undue regulatory burdens on small firms in a market.

First, a package of reforms in Germany have provided the German Bundeskartellamt with the ability to declare a firm to be "of paramount significance for competition across markets" (Bundeskartellamt, 2020, p. 12_[73]). These reforms supplement abuse of dominance tools by giving the Bundeskartellamt the ability to address potential competition problems in markets not yet dominated by a firm. This designation can apply to firms that are not dominant but nonetheless hold a key strategic position, for example due to

vertical integration, data access, or their role in controlling other firms' access to supply and sales markets). Firms declared to have this status are now explicitly prohibited from "[i]mpeding competition by hampering interoperability or data portability" (Bundeskartellamt, 2020, p. 13^[73]).

Second, in its Online Platforms and Digital Advertising market study, the UK Competition and Markets Authority made recommendations regarding interoperability. The study was being conducted in the context of recent reforms establishing a Digital Markets Unit (DMU) within the Authority, which will have powers to enforce a code of conduct for large digital platforms (UK Government, 2020^[74]). The study recommended that the DMU be granted powers to mandate interoperability for digital platforms, noting that "the case for interoperability is greater in respect of functionality which is: directly helpful in overcoming identified network effects; not highly innovative; and in respect of which privacy concerns can be managed effectively" (Competition and Markets Authority, 2020, p. 26^[16]). For example, with respect to social media, the study suggests interoperability requirements could be focused on finding contacts and cross posting of content.

The study also considered data portability, and recommended that the DMU be given powers to introduce requirements regarding a common user ID across platforms, which could enable data sharing by a user across platforms. From a competition perspective, the study suggests that data sharing across platforms would be of the most benefit where data are valuable in overcoming barriers to entry and expansion, and platforms do not incur significant costs to store these data (p. 414^[16]). The study also indicates that, to manage privacy concerns, data portability should be user initiated, and that intermediaries such as Personal Information Management Services (PIMS) could help (although their business model is still developing, as discussed in Box 8 below).

Both the German and UK approaches retain the advantages of competition law relative to static regulation mentioned in Section 4.1, namely flexibility and potential for adaptation in remedy design.

Box 8. Personal Information Management Services

PIMS have been identified as a potential catalyst for the development of digital markets with respect to consumer data. In particular, when APIs are accessible, PIMS can play a role in co-ordinating a consumer's data transfer across platforms, facilitating data portability. They can enable continuous data transfers, and facilitate the translation of data across digital services (for example when formats or schemas differ). In addition, PIMS can give users a single point of contact for users to control the data collection permissions they grant different digital firms. Other functions can include providing a single point of user authentication, storing data, and even managing arrangements for monetary compensation in exchange for data.

Given this range of functions, some policymakers have considered PIMS to be "the silver bullet, which is the missing building block for a fair and transparent data economy" (Krämer, Senellart and de Streel, 2020, p. 66^[7]). However, PIMS are in their early stages, and the underlying business models of these services are still to be developed (for example whether PIMS can earn revenues by acting as data brokers, subscription services, or even non-profit open source or subsidised services). Further, some of the roles PIMS could play may well be filled by digital platforms that are better positioned in terms of data access and consumer relationships.

Source: Krämer, Senellart and de Streel (2020^[7]) and Krämer (2020^[35]).

A third example of digital platform-specific legislative proposals is the EU Digital Markets Act.³² The proposed Act would apply specifically to digital gatekeepers that "enjoy or are expected to enjoy an entrenched and durable position in their operations."³³ The provisions of the act include:

- Requiring gatekeepers to provide users with real-time and continuous access to their data³⁴

- Prohibiting gatekeepers from requiring business users to use or interoperate with the gatekeeper's identification service when using the platform³⁵
- Requiring gatekeepers to allow interoperation with third party applications or application stores on their core platform, and to allow these applications or application stores to be accessed outside of the core platform³⁶
- Requiring gatekeepers to ensure equal access and interoperability for third parties providing ancillary services when a gatekeeper provides its own ancillary services running on its core platform³⁷

A recent report commissioned by the European Commission with respect to the Act highlights two examples of potential changes stemming from the last provision listed above: mobile device manufacturers may need to grant rivals access to near-field communication chips (for payment services) and voice assistants on mobile devices (Cabral et al., 2021, p. 18^[8]).

Key considerations regarding mechanisms for implementing data portability and interoperability

- Data portability and interoperability measures may involve various objectives, such as data protection and consumer empowerment and so their impact on competition will vary. The design of these measures will require a clear objective, a conscious balancing of different potential impacts, and close interdisciplinary and international co-operation among different regulators and policymakers.
- Data portability and interoperability measures can be considered as competition enforcement remedies. The benefit of this approach is a focus on competition harms, and the source of those harms, such as a dominant firm. In addition, competition law remedies can be flexibly designed according to the situation of a given market, and adapted as the market evolves. However, these remedies may require substantial oversight, which may be a challenge for authorities.
 - Degrading data portability or interoperability could be a method of implementing anticompetitive margin squeeze, bundling, or switching cost strategies, and could thus be considered in abuse of dominance or merger proceedings. The conditions of digital platform markets may better fit these theories than essential facilities-type theories regarding data access in some instances. However, it may be challenging to assess these theories in cases where there were no pre-existing portability or interoperability arrangements.
 - Collusive arrangements among market participants to deter entry through selective interoperability may also arise.
 - More broadly, data portability and interoperability may be considered as remedies to address broader market conditions giving rise to competition concerns in abuse and merger cases.
- Competition authorities in some jurisdictions have also imposed or recommended portability and interoperability measures through market studies, market investigations and advocacy activities.
- Ex ante regulation, whether sector-specific or horizontal, may be a preferable approach, particularly when there is a sector regulator in place or significant surveillance and dispute adjudication will be required. This approach may also be faster or more preventative than competition enforcement.
 - Examples of a regulatory approach include data protection regulation (which may be less effective or potentially harmful for competition), open banking (which has been used to enable multi-homing, shopping around, and mixing and matching), and proposed new measures focused on gatekeeper digital platforms.

5. Implementation challenges

The design of data portability and interoperability measures will determine their effectiveness, and effect on competition, regardless of their primary objective. This section will lay out some of the key questions to be considered in this regard.

5.1. Defining the range, format and frequency of data to be included in data portability measures

Implementing even the most simple, static data portability measures will require specifying the range of data to be made available to users. A clearly defined scope will be essential for the legal certainty needed to make data portability effective (Krämer, Senellart and de Streel, 2020, p. 10^[7]). From a competition perspective, this scope should include any data needed to allow users to switch services without incurring significant switching costs (including time spent on replicating inputted data, or limited functionality).

When individual user data is helpful, the scope of data defined in a portability measure will need to consider the range of data needed for firms to be able to enter a market. This will require market testing with potential entrants or rivals of dominant firms. For example, with respect to social networking, some have argued that a user's uploaded content would not be sufficient to enable switching, and in particular portability measures must include a user's connections (or "social graph") (Zingales and Rolnik, 2017^[40]). Subsequent studies have questioned whether even this information would be sufficient for competitors, however (Nicholas and Weinberg, 2019, p. 13^[31]).

Also relevant are the conditions in which data portability is executed. For instance, the value of a dataset may depend on whether it is provided in a structured or unstructured form, and whether its format is easily readable by a recipient. Nicholas and Weinberg emphasise the need for portability standards to include: (1) a specific data structure with documentation to help interpret it, (2) provisions to ensure stability in systems to prevent updates or changes from compromising portability functions, and (3) unique identifiers for users across platforms to facilitate porting (Nicholas and Weinberg, 2019, pp. 18-19^[31]).

Another important parameter of portability measures is whether data are provided on a one-off basis to users upon request or continuously, and whether the data transfer is subject to delays or is immediate. This will partially depend on the outcome a data portability measure seeks to achieve in a particular market. If users are not likely to multi-home or use multiple connected services associated with a digital platform, they may find one-off data transfers sufficient (e.g. when transferring bill payments to a new chequing account). However, in order to be effective in digital platform markets, most data portability measures may need to be dynamic, and involve minimal delays. Some have suggested there are no technical limitations to such requirements, although there may be challenges and costs involved that need to be balanced when establishing the precise requirements in each market (Krämer, Senellart and de Streel, 2020, p. 86^[7]).

The scope of data included will need to reflect a careful balancing of other risks and policy objectives. First, while user switching costs and entry barriers could be most effectively addressed with a broad scope for data portability, there is a risk that excessively broad portability can contribute to market transparency and facilitate either explicit or tacit collusion.

Second, when portability measures include data that required significant investments to obtain, they may risk discouraging such investments and adversely affecting the development of a market. In some markets, these investments occur in data collection (e.g. when providing content or loyalty benefits in exchange for a user sharing their data), whereas in others data collection can be a natural product of a digital service. In other cases, much of the investment will focus on deriving value from raw data, for example by generating inferred data or by expending significant resources of organising and storing a dataset. Thus, it may be necessary to narrow the scope of data included in data portability in order to protect competition that benefits users in terms of data analysis and insight, or at least consider compensation on FRAND-type terms.

Third, as described extensively above, data protection legislation may limit the scope of data portability, particularly in markets where a user's ported data may only be valuable if it includes data from other users. If it is difficult or impossible to obtain consent of other users due to data protection rules, then the effectiveness of data portability in overcoming switching costs and entry barriers may be minimal. Further, if data protection rules impose a significant compliance burden on small firms and new entrants, they may also mitigate the value of ported datasets.

5.2. Defining the scope of interoperability measures

Interoperability requirements can be a mechanism to promote competition both *within* ecosystems (to achieve the unbundling of products, particularly when digital platforms feature complementary services, such as applications running on an operating system) and *between* ecosystems (by enabling switching and multi-homing without the loss of network effects). The scope of interoperability requirements will differ depending on which of these objectives applies (or whether they both do). The design of interoperability will therefore need to include an assessment of where in a product supply chain or ecosystem is competition feasible and desirable (and similarly where competition harms are currently occurring or likely to occur).

In the example of a mobile device, interoperability measures could theoretically apply with respect to various components or services: between hardware components, between devices and different operating systems, between operating systems and applications or complementary services, between device components and different applications, and between different product ecosystems (e.g. different device, operating system and application combinations). Ensuring interoperability between different operating systems, for example, could facilitate switching and prevent user lock-in. Alternatively, ensuring interoperability between operating systems and different applications could prevent bundling and tying.

These two objectives (interoperability within versus between ecosystems) are interrelated. As Kerber (2019^[36]) notes, the effects of bundling may be more likely to be anticompetitive if competition between ecosystems is hampered. This may be due to the cost of the device or core platform, and other lock-in effects.

Another aspect of the scope of interoperability measures is the degree to which they are open. There may be valid justifications for limiting access to certain systems and data to a specified set of firms or stakeholders, such as data security risks – especially if sensitive information such as banking details are involved. Thus, interoperability measures may need to be designed in order to encourage as much openness as possible, while recognising the need for some limits.

There is also a risk that the scope of interoperability measures is too broad. In particular, the mandatory imposition of standards may unintentionally entrench an incumbent's technologies, or disincentivise innovation using alternatives. Thus, the design of standards will need to reflect the balancing of these risks, and may need to be revisited as the market develops. However, some have suggested that the risks to innovation incentives from interoperability may be more limited for digital platform services such as social

networking. For instance, Kades and Scott Morton suggest that increased competitive pressure stemming from easier switching among social networks would provide strong incentives to innovate and improve quality (2020, p. 15^[47]).

5.3. Standard-setting challenges for data portability and interoperability measures

Portability and interoperability measures are likely to involve some degree of standard-setting (with the exception of purely static portability measures that do not specify common data formats, for example). This standard-setting, when mandated through enforcement or regulatory action, is likely to require oversight, clearly defined decision-making powers, and funding decisions.

5.3.1. Determining how standards will be implemented and disputes resolved

Once a public authority decides to impose portability or interoperability measures, it may need to establish detailed standards for compliance – particularly if there is a risk of the measures being undermined by uncertainty, used for exclusionary purposes by incumbents, implemented in an incomplete manner, or subject to disputes. These standards can be developed by public authorities and enforced through regulation. However, in some cases the authority imposing the measures may lack the resources and expertise to develop granular technical details regarding implementation. Thus, SSOs or other third parties may be appointed in order to co-ordinate and oversee standard setting with the various stakeholders in the market. One such example is the Open Banking Implementation Entity established as part of the UK banking reforms described above. Notably, the OBIE was granted the powers to impose solutions when no consensus among stakeholders could be reached, preventing deadlock from undermining the measures before they could be implemented. Without such powers, the use of third parties to implement portability or interoperability standards may be ineffective.

Data portability and interoperability mechanisms can involve a range of technical and legal liability challenges, making their implementation complex. Further, there may be diverging incentives among stakeholders involved, for instance if a dominant platform seeks to limit the benefits of these measures for rivals. Thus, active monitoring and enforcement will be necessary (Krämer, Senellart and de Streel, 2020, p. 10^[7]). Further, disputes are likely to occur, and may require a resolution mechanism when non-discrimination requirements are in place. Such a mechanism could adjudicate on questions such as whether a refusal to provide access to an API is justified on safety or security grounds, or whether sufficient safeguards are feasible and the refusal may be a cover for anticompetitive strategies. Consideration may need to be given to ensuring equal access to dispute resolution, for example when small new entrants are unable to retain sufficient legal resources to contend with large, established incumbents.

For competition authorities, the implementation and supervision of technical interoperability or portability remedies can be challenging. These challenges are not in fact unique to remedies in digital platform markets, and may require authorities to impose arrangements such as the imposition of monitoring trustees to oversee implementation. Kades and Scott Morton (2020^[47]) suggest, however, that authorities should play a key role throughout the administration of these remedies. In particular, while a third party can be appointed to advise on the technical aspects, the competition authority should have the final decision-making authority for rulemaking, should start with an assumption that a defendant may seek to undermine the remedy, and should be prepared to issue fines for noncompliance (pp. 31-32^[47]).

5.3.2. Funding the implementation of standards

Interoperability and data portability measures, particularly when they relate to new functionality rather than maintaining previously existing arrangements, can involve implementation costs. While the magnitude of these costs will vary among markets, they are likely to be raised as a concern by implementing parties.

Thus, public authorities imposing portability and interoperability measures may need to consider how to fund them.

One option is to require large incumbents to cover the cost of developing APIs to access their platforms, along with any other adaptations that must be made to their systems to enable the use of these APIs. This was the approach with Open Banking in the UK, which was funded by the UK's nine largest banks and building societies.³⁸

Alternatively, costs could at least partially be covered by firms benefitting from data or APIs, for example through licensing arrangements subject to requirements regarding fairness and reasonableness. The European Commission's Expert Panel on Competition for the Digital Era has indicated that, for digital platforms, portability and interoperability costs could be covered by gatekeeper platforms if low enough, but could also be recovered through licensing fees on firms that benefit from these initiatives (Cr mer, de Montjoye and Schweitzer, 2019, p. 109_[11]).

There may also be situations when users could directly fund portability and interoperability initiatives (they may indirectly fund these initiatives if firms are required to cover the costs in any event, through higher prices or more advertising exposure). However, high prices for these services could significantly undermine their effectiveness. Public funding could also be considered, particularly in cases where there are both public and private gains from portability, meaning that there may be market failures resulting in insufficient portability (Giovannetti and Siciliani, 2020, p. 8_[27]).

Key considerations regarding the implementation challenges associated with data portability and interoperability

- Implementing data portability measures will require identifying what data should be included, potentially based on an assessment of what would be needed to enable entry in a market. The format in which data are provided, the timeline, and the static or dynamic nature of the transfer process will also be important considerations. At the same time, risks associated with collusion due to market transparency, and risks associated with intellectual property protections, will need to be identified, evaluated and navigated.
- Implementing interoperability will require identifying whether the measure seeks to promote competition within or between ecosystems, and where in the supply chain or ecosystem would competition be feasible. Overly broad interoperability standards may harm innovation and entrench incumbents.
- Active monitoring and enforcement may be needed in order to ensure the implementation of portability or interoperability measures, and to resolve any disputes that may arise. These measures will generally include conditions of access, for example non-discrimination and reasonableness of licensing fees, in order to distinguish legitimate limitations (e.g. relating to security and data protection) from anticompetitive strategies.
- To implement these measures, third parties or specially created implementation entities can be used (for example the Open Banking Implementation Entity used in the UK). In the case of measures initiated through competition enforcement or market studies, however, competition authorities may wish to retain a supervisory and ultimate decision-making role.
- The allocation of costs associated with portability and interoperability measures will reflect a policy judgment, and can depend on the circumstances and objectives of the measure. They may be borne by incumbents, by firms benefitting from the access they provide, by users, or even subsidised by the government or mitigated through open standards and non-profit management.

6. Conclusions

This paper has sought to describe the role that data portability and interoperability measures can play in promoting competition both within and among digital platforms. At their best, these measures can lead to invigorated competition, with engaged and empowered consumers being offered a wide range of unbundled products and services. They can address the barriers to entry in markets stemming from network effects, and encourage innovation. Further, they may be an attractive competition enforcement remedy and alternative to pursuing cases involving the refusal to supply data. They may also be part of broader regulatory reforms, either sector-specific or horizontal in scope.

These measures are not a fit for every circumstance, however. When a dominant digital platform faces no rivals (including potential entrants with sufficient capacity to compete), these measures may be more appropriate for promoting competition in related and complement markets than in enabling the emergence of rivals to the core platform. The value of an individual user's ported dataset may also be limited for the purposes of a new entrant seeking to counter an established incumbent's advantage in collected data. Interoperability may need to be limited to markets that are not rapidly evolving due to innovation, and focused on a particular set of firms with durable market power. In addition, data portability and interoperability measures should be selected and designed to avoid unintentional competition harms, for example imposing significant burdens on new entrants, entrenching an incumbent's systems and technologies, or discouraging innovation through overbroad standards.

Further, it is clear that the objective of data portability and interoperability measures matters. Portability and interoperability measures implemented with objectives other than competition (such as data protection) may not have procompetitive impacts unless designed with market dynamics in mind. This suggests the importance of involving competition authorities in the design of these measures, and close co-operation between different authorities in implementation. Further, the use of data portability to achieve multiple simultaneous objectives may need to be reconsidered.

Despite these challenges, the potential of these measures should not be ignored – particularly with respect to interoperability (including interoperability enabling dynamic data portability). Evidence regarding the effectiveness of these measures is currently limited. However, experience is being accumulated quickly. Initiatives such as open banking and the innovations they have spurred provide some inspiration. Moreover, interoperability considerations are being included in proposals regarding new obligations for digital gatekeeper firms. The range of measures designed outside the context of competition policy is even broader.

The implementation of data portability and interoperability measures so far highlight some key considerations to bear in mind; namely the need for: clear definitions of scope and procedures (such as data transferral delays); conditions such as non-discrimination requirements designed with competition objectives in mind; the designation of an entity or authority with rulemaking, dispute resolution and compliance monitoring power; and careful consideration of how to fund implementation.

The data portability and interoperability measures designed so far only scratch the surface of what competition policymakers and enforcers may be called on to consider in the future. In particular, digital platforms may reshape many facets of consumers' lives, ranging from healthcare, to transportation, to the development of connected home technologies. In order to be effective, these measures may need to be

complemented with other approaches, including a better understanding of demand-side behavioural factors that be limiting competitive dynamics.

Promoting competition in the design of these measures, or proposing their implementation in order to encourage competition, may therefore be of increasing importance for the competition policy community. These measures can fit into a broader debate about the role of government policy in promoting innovation, and addressing concerns about durable market power (see, for instance, OECD (2018^[14])). When set in this context, well-designed data portability and interoperability measures may be an attractive option, at least as part of a broader set of measures to tackle conduct and structures in digital markets that distort competition and undermine economic wellbeing.

Endnotes

- ¹ See, for instance, OECD (2016_[20])
- ² See, for instance, OECD ECOSCOPE Blog, “Competition in the digital age”, 31 May 2019, <https://oecdecoscope.blog/2019/05/31/competition-in-the-digital-age/>
- ³ (Australian Competition & Consumer Commission, 2019_[32])
- ⁴ (Crémer, de Montjoye and Schweitzer, 2019_[11])
- ⁵ (Japan Fair Trade Commission, 2017_[58])
- ⁶ (Authority for Consumers and Markets, 2020_[70])
- ⁷ (Digital Competition Expert Panel, 2019_[59])
- ⁸ (Stigler Committee on Digital Platforms, 2019_[41])
- ⁹ See, for instance, Swire (2020, pp. 80-84_[26])
- ¹⁰ See, for instance, OECD (2020, p. 45_[6])
- ¹¹ This is also referred to as “protocol interoperability” (Crémer, de Montjoye and Schweitzer, 2019, p. 58_[11]).
- ¹² See www.plaid.com.
- ¹³ Through the Telecommunications Act of 1996, further discussed in Swire (2020, p. 37_[26]).
- ¹⁴ Through Google Takeout and Facebook’s Download Your Information services <https://www.facebook.com/help/212802592074644>.
- ¹⁵ <https://datatransferproject.dev/>
- ¹⁶ See discussion on margin squeeze in digital markets in OECD (2020, p. 34_[52]).
- ¹⁷ European Commission, Press Release: Mergers: Commission clears acquisition of Fitbit by Google, subject to conditions, 17 December 2020, https://ec.europa.eu/commission/presscorner/detail/en/ip_20_2484
- ¹⁸ Paragraph 319, European Commission, Case No COMP/M.8744 – Daimler/BMW Car Sharing JV, Article 6(1)(b) in conjunction with Art 6(2), https://ec.europa.eu/competition/mergers/cases/decisions/m8744_1326_7.pdf
- ¹⁹ Page 4, Annex: Commitments to the European Commission, Case No M.8744 – Daimler/BMW Car Sharing JV, Article 6(1)(b) in conjunction with Art 6(2), 07/11/2018, https://ec.europa.eu/competition/mergers/cases/decisions/m8744_1326_7.pdf.
- ²⁰ European Commission, Case No M.8124 – Microsoft/LinkedIn, Article 6(1)(b) in conjunction with 6(2), 06/12/2016, https://ec.europa.eu/competition/mergers/cases/decisions/m8124_1349_5.pdf
- ²¹ European Commission, Case No M.8314 – Broadcom/Brocade, Article 6(1)(b) in conjunction with Art 6(2), 12/05/2017, https://ec.europa.eu/competition/mergers/cases/decisions/m8314_662_3.pdf.
- ²² European Commission, Case No M.8305 – Qualcomm/NXP Semiconductors, Article 8(2), 18/01/2018, https://ec.europa.eu/competition/mergers/cases/decisions/m8306_3479_3.pdf
- ²³ Paragraph 113, European Commission, Case No COMP/M.7217 – Facebook/WhatsApp, Article 6(1)(b) Non-Opposition, 03/10/2014, https://ec.europa.eu/competition/mergers/cases/decisions/m7217_20141003_20310_3962132_EN.pdf.

²⁴ Through the Consumer Data Right, per Treasury Laws Amendment (Consumer Data Right) Act 2019, <https://www.cdr.gov.au/>.

²⁵ SB-1121 California Consumer Privacy Act of 2018, https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1121.

²⁶ The EU General Data Protection Regulation, Regulation (EU) 2016/679 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02016R0679-20160504&qid=1532348683434>.

²⁷ The approach taken in GDPR, for example, focuses on rights to data protection rather than granting full ownership rights to consumers of their personal data (Graef, Verschakelen and Valcke, 2013, p. 1368_[63]).

²⁸ Relatedly, the G20/OECD Task Force on Financial Consumer Protection, a sub-body of the Committee on Financial Markets has been considering issues relating to the protection of financial consumers' assets, data and privacy in the context of ever greater digitalisation of financial products and services and the risks and benefits for financial consumers. In December 2020, the Task Force released a new Policy Guidance Note, *Financial Consumer Protection Policy Approaches in the Digital Age: Protecting consumers' assets, data and privacy* (OECD, 2020_[75]). This Policy Guidance Note outlines developments and innovations relating to digitalisation and the use of consumer data (including for example, account aggregators, Open Banking, digital or mobile payments and wallets, automated risk assessment and decision making, robo-advice and cryptocurrencies), and sets forth practical, non-binding guidance for protecting consumers' data and privacy and enhancing digital security. Among other things, the Policy Guidance Note includes the following approaches for financial consumer protection policy makers and public authorities to consider (OECD, 2020, pp. 23-25_[75]):

Policy makers and oversight authorities should work with financial services providers to encourage them to (1) make their information collection and use practices transparent and (2) give consumers the ability to make decision about their data at a relevant time and context. Financial services providers should be responsible for using data only for legitimate purposes and in a manner that serves customers' interests. For example: this can be done for example via a legitimate purposes test, which limits the use of data to what is compatible, consistent, and beneficial to consumers, while allowing firms to use de-identified data to develop new and innovative products and services; and/or via a fiduciary duty requirement, which requires data collection and processing firms to always act in the interests of, and not in ways detrimental to, the subjects of the data.

Policy makers and oversight authorities should explore with financial services providers arrangements that allow consumers to share their financial transaction data with authorised third parties including FinTech companies. Privacy and data security concerns should not act as barriers to such innovation, which can promote development of innovative financial management services (such as Open Banking or other financial tools) and in doing so support greater financial inclusion.

²⁹ <https://www.openbanking.org.uk/customers/what-is-open-banking/>

³⁰ <https://www.openbanking.org.uk/customers/what-is-open-banking/>

³¹ Loi 2016-1321 du 7 octobre 2016 pour une République numérique, as described in Graef et al (2018, p. 1396_[5]).

³² Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on contestable and fair markets in the digital sector (Digital Markets Act).

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³³ Chapter II, Article 3(1).

³⁴ Chapter III, Article 6(1)(h)

³⁵ Chapter III, Article 5(e).

³⁶ Chapter III, Article 6 (c).

³⁷ Chapter III, Article 6 (f).

³⁸ <https://www.openbanking.org.uk/about-us/>.

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