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Data portability among online platforms

Barbara Engels
Structural Change and Competition Unit, Cologne Institute for Economic Research (IW), Cologne, Germany

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Abstract: This paper examines the competition effects of data portability among online platforms, providing policy recommendations for the preservation of innovative, undistorted competitive markets. Based on a platform-data model, it is illustrated how users, data and the products of a platform are related. Platform markets which entail an especially high risk of market power abuse are determined. It is concluded that the right to data portability as in the EU's General Data Protection Regulation has to be interpreted in a nuanced fashion in order to avoid adverse effects on competition and innovation.

Keywords: Data protection, Competition law, Digital market

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1. INTRODUCTION

Multi-sided online platforms such as social networks, search services and trading platforms are capable of creating enormous benefits for societies and economies. It is however easy to be uneasy about the impact of these online platforms: they quickly achieve scope and huge market valuations, and they use vast amounts of data in an opaque fashion. Many of the calls for new regulatory provisions for online platforms overlook the particular characteristics of platform markets such as network effects and switching costs. Also the General Data Protection Regulation (GDPR) for the EU partially fails to account for these peculiarities. It is often neglected that most conventional methods of economic analysis are not adequate for the analysis of multi-sided online platforms and might lead to improper regulation recommendations (e.g. Goldfarb et al., 2015). For example, the multi-sided nature of services and the importance of data oftentimes play too little of a role in economic policy analysis (Monopolies Commission, 2015).

This paper offers a potential way out by analysing platform-specific competition effects. It focuses on one of the key drivers of switching costs, namely the extent to which data is portable from one platform to another. The main concern derived from the absence of data portability is the user lock-in effect, which might constitute a market entry barrier for other companies and hence distort competition (Shapiro & Varian, 1999). In fact, platform providers usually store the user's data such that it cannot be extracted by the user or a competitor. Thus, once customers have chosen a platform and 'invested' their data, they can only change to another platform at the cost of leaving their data. In case of price increases and service changes, they consequently have a reduced negotiation power. The risk of lock-in is still the norm rather than the exception when it comes to online platforms. Many companies strive for a competitive edge by exclusively collecting and processing data, as data is considered the main production factor in the digital economy (e.g. Graef et al., 2015; Liem & Petropoulos, 2016). The fact that online platforms have an interest to keep their systems closed can also lead to access problems for other companies that need user data in order to provide competing or complementary products and services.

The direct effects of data portability on competition and innovation have not been analysed thus far. The EU'S GDPR, however, contains the user's right to data portability between online platforms. The main goal of this regulation is to give data subjects more control over their personal data and to increase user choice of online services. However, data portability presumably also affects the level of competition on a market.

The contribution of this paper is that it examines the effects of the right to data portability on competition, providing policy recommendations for the preservation of innovative, undistorted competitive digital markets. In order to economically assess data portability from a competition-policy perspective, this paper examines how data, users, and platform services are related and how these relations change under data portability. Different platform-data model specifications are distinguished depending on whether the platforms in question offer substitute or complementary products and services. In a second step, this paper discusses in which platform markets the risk of an abuse of market dominance is particularly high. Based on this assessment, platform markets are determined where the right to data portability is indeed likely to foster competition and innovation.

2. COMPETITION IN PLATFORM MARKETS

As a first step of the analysis of competition effects of data portability among online platforms, the peculiarities of online platform markets are discussed. This paper distinguishes between three main platform types based on the activities that consumers perform on them, namely marketplaces, social networks, and search services (Table 1).

Table 1: Taxonomy of online platforms. Main online platform types based on consumer activities.

Type	Search engines / Information services	Online marketplaces	Social networks / Communication
Activity	Look up information	Buy, sell, share products and services	Private and professional communication, networking tool

Type	Search engines / Information services	Online marketplaces	Social networks / Communication
Example	Google, Bing, Yahoo, DuckDuckGo, Wikipedia	eBay, Amazon, Vinted, AirBnB, Asos, Booking.com, Uber, BlaBlaCar	Facebook, Google+, LinkedIn, Twitter, Xing, Instagram, Flickr

Five main forces determine the level of market concentration in digital platform markets and thus the competition between platforms, namely economies of scale, congestion, differentiation, switching costs and network effects (Evans & Schmalensee, 2007).

Increasing returns to scale are typical of platform markets, as many companies have relatively high fixed costs and relatively low variable costs. These economies of scale foster market concentration. Capacity constraints or congestion may emerge in platform markets as a result of negative externalities caused by additional users, e.g. through an increase in search and transaction costs. Platform differentiation forms the third market concentration force. The more heterogeneous user preferences are, the easier it is for platforms to differentiate horizontally or vertically. Capacity constraints and the scope of platform differentiation counteract market concentration.

Switching costs are negatively correlated with data portability: the easier it is for the consumer to port his data from one platform to another, the lower are his costs to switch to another platform. Direct network effects mean that the benefits that individuals on one side of a platform obtain from using the platform directly increase with the number of other users on the same side of the platform (Katz & Shapiro, 1985). Indirect network effects imply that users on one side of the market indirectly benefit from an increasing number of users on their platform side, as this increase attracts more users on the other market side.

In order to assess the potential competition effects of data portability, it has to be determined to which extent companies are successful because they protect themselves against competition by exploiting the above market concentration forces, and to which extent they are successful in competition by virtue of superior products and innovations.

3. DATA AND DATA PORTABILITY

Broadly defined, data portability is the possibility for users to transfer their personal data to different online platforms. Personal data is “any information relating to an identified or identifiable natural person” (European Parliament and Council, 2016, Article 4).

The right to data portability is included in Article 20 of the GDPR. [1] The right requires controllers to provide personal data to the data subject in a commonly used format, where controllers process personal data through “automated means”. “Where technically feasible”, the data subject shall have the right to have the personal data transmitted directly from one controller to another. Recital 68 of the GDPR, however, specifies that it does not impose an “obligation for the controllers to adopt or maintain processing systems which are technically compatible” (European Parliament and Council, 2016, Recital 68). The right to data portability applies only when processing was originally based on the user’s consent or alternatively on a

contract.

It is important to distinguish between the user's right to data portability as laid down in the GDPR and the competition enforcement through a case-by-case assessment, which focuses on the duty of providers. The GDPR regulation applies generally, while competition enforcement is more flexible and only takes place in certain situations (Graef et al., 2013). For example, Article 102 of the Treaty on the Functioning of the European Union might give rise to a duty for providers to facilitate data portability in case a refusal constitutes abuse of dominance (TFEU, 2008). As such, the right to data portability does not eliminate the competition law intervention for facilitating data portability, which may in itself be more strict than the regulation, also because it does not only apply to personal data but to all data.

The right to data portability as included in the GDPR applies to a garage start-up software company just as it does to a monopolist. This might impose disproportionate compliance burdens for small companies, as many SMEs do not have the resources to be aware of their compliance obligations and write a corresponding software to meet them (Swire & Lagos, 2013). For non-compliant companies, the GDPR will threaten significant fines and penalties once it comes into force in May 2018.

The technical requirements for implementing data portability might be very high since, ideally and *de facto*, a technical measure should be established that facilitates data transfers, which seems to be at odds with the provision of Recital 68. The right to data portability as far as it concerns the reception of a user's personal data (not the direct data transfer to another platform) applies to all automated processing systems independent of whether transfer of data is already technically possible (Graef et al., 2013). Still, data controllers would have to implement processes for handling and documenting user's requests. In order to enable data portability, platform operators will need to use "structured, commonly used and machine-readable" data formats and templates. In practice, the receiving service should be able to process the data extracted from another platform in an efficient manner. This might force some platform providers to change their design to a certain standard, which still needs to be established (Yoo, 2012).

Data portability should not be confused with interoperability, which goes further than data portability. Interoperability between online social networks for example would enable users to connect with each other irrespective of their social network affiliation. Facebook users would then be able to directly post a message on someone's Google+ page (Graef, 2015). With data portability, by contrast, Facebook users could take their profile and message history to Google+ and open a new Google+ account based on this information. In other words, they would not have to start from scratch when changing or additionally using platforms. The right to data portability would, to give another example apart from social networks, also imply that users could move their information uploaded into a cloud storage service directly to a competing cloud storage service (Graef et al., 2013).

When it comes to legal aspects, data portability is likely to raise issues like privacy and data security. If data is portable, a single identity fraud can turn into a long-lasting breach of personal data, since a hacker can easily port his false identity to many other platforms. This is especially alarming in times of weak authentication and rampant identity theft. Platform providers will likely have to expand their investment in data security measures.

Another legal issue raised by data portability is the fact that multiple individuals might claim control over certain information. Making this information portable might infringe property

rights. The right to data portability is also difficult to apply in cases where multiple data subjects are involved who disagree on the data transfer. For example, multiple people might appear in a photograph: Allowing one user to transfer a second user's information may violate the privacy rights of second user. What is more, people can easily evade privacy restrictions placed by the initial platform by porting the data over to another platform not subject to these restrictions (Grimmelmann, 2009). These legal uncertainties will impose challenges to platform providers.

Still, platforms have an incentive to collect, possess, process and utilise user data in an exclusive manner, since data is a significant asset in platform markets. Platform providers have developed services and business models whose success relies heavily on the acquisition and treatment of personal data. [2]

The high significance of data can result in customer retention (Shapiro & Varian, 1999, pp. 32ff). Customer retention is problematic from a competition-policy point of view if it is the consequence of lock-in effects that might have direct or indirect negative effects on competition and consumer welfare. Lock-in effects can occur because of high switching costs based on the absence of data portability. They arise when the costs of switching to another platform are prohibitively high, such that a customer remains with a particular platform although a rival platform might offer a better service. Also, consumers oftentimes want to use several platforms at the same time for a certain service (multihoming), for example because the services offered by a second platform are slightly different or the second platform is used by a slightly different network.

Switching costs are fueled by direct network effects and coordination costs. Without data portability, contacts cannot be transferred to another platform and information that has once been shared, i.e. data that the user has directly or indirectly "invested", such as messages, photos, reputation and search histories, remain with the original platform. The user is therefore more likely to stay with the platform that she initially provided his data to, although rival platforms might otherwise be more attractive to him. This might harm competition since potential competitors might not have an incentive to innovate and offer better services, knowing that users will nevertheless remain with the incumbent platform.

The specific business model and the product portfolio of an online platform add an important dimension to the issue of data portability. Platforms do not necessarily act as rivals since they do not always offer substitute services (unlike Facebook and Google+ or Google and Bing). Oftentimes, they offer services that are complementary. By allowing data portability, a company offering complementary [3] services could increase its attractiveness, since it might also attract users that are originally interested in a complementary service offered by another platform.

From a competition-policy point of view, data portability should be guaranteed where it improves competition and encourages innovation. Against the backdrop of different platform types and competitive relationships (substitutes vs complements), it seems plausible that data portability should not be an all-or-nothing feature as suggested in the general definition of the GDPR. The policy challenge is to set the balance right in order to encourage the kinds of data portability that drive competition.

The following chapter introduces a platform-data model that illustrates the effects of the production factor data in digital markets. The effects vary depending on whether the offered products and services are substitutes or complements.

4. PLATFORM-DATA MODEL

Two main specifications of a platform-data model are developed. The first one illustrates the case of two platforms that offer essentially the same products (substitutes). The second one illustrates the case of two platforms that offer complementary services (e.g. a trading and a payment platform).

In both the substitute and the complementary case, the number of users is positively correlated with the volume and quality of data. [4] Volume and quality of data are positively correlated with the variety and quality of the offered products and services, since companies can offer better products by analysing "more" consumer behaviour. From the offered services themselves, data can also be extracted, and again be used to improve services.

Similarly, the variety and quality of products and services is related to the number of users: the more users, the more and better services are offered. More and better services again attract more users – which are an asset to the platform characteristic of network effects (Evans & Schmalensee, 2007). Because the value of the platform increases as new users are added, the value of the network increases for future adopters, which will make the platform more attractive to them.

The above correlations between data, users and products assume the existence of a single platform in the market. The case of several platforms is considered in the following.

4.1 PLATFORMS OFFERING SUBSTITUTES

In the first case, the platform market is determined by two platforms A and B that offer substitutive products and therefore act as rivals. Figure 1 shows this substitute case. The viewpoint is that platform A is the incumbent and platform B tries to enter the market or otherwise gain market share by offering a better product than platform A. Data portability is given.

If platform B enters the market and offers a better product than platform A, the number of users of platform B will increase, while the number of users of platform A will decrease. This is the case because, given data portability, users can easily switch to a new platform. New users entering the market as a result of the emergence of platform B presumably only affect the customer base of platform B, and have no direct effects on the customer base of platform A, since they would have entered the market before the emergence of platform B if platform A had been attractive to them.

The volume and quality of personal data that is currently extracted from the users will increase for platform B and decrease for platform A. If former users of platform A claim the "right to be forgotten" (European Parliament and European Council, 2016, Article 17), i.e. the erasure of their personal data, the volume of archived data will also decrease for platform A.

Product quality will increase for platform B and decrease for platform A (indicated in Figure 1 by the height of triangle), since platform B will be able to base its service development on more data than before and hence will be able to better customize its services. Platform A, on the other hand, has fewer data at its disposal and will therefore presumably experience a decrease in quality. Platform B will, in addition to offering better quality, be able to offer more services than before (higher variety indicated by broader triangle), since more users imply more heterogeneity

in preferences and hence more demand for services, which are enabled by a larger network.

The variety of products and services will not decrease for platform A unless it experiences a major consumer loss which revokes the efficiency of certain products through the cancellation of network effects. This might be the case because of the economies of scale property of platform markets: establishing products requires high initial investments, but the marginal cost of additional customers is small. Once established, products likely continue to exist even if the consumer base decreases.

All in all, when under data portability, platform A is deprived of a given customer because a competitor offers a better product and the customer switches to this competitor, platform A will not only lose the potential revenue from that customer but will also suffer a loss in the overall value of the platform. [5]

If data portability is not guaranteed, platform A can potentially preclude platform B from entering the market or from gaining a higher market share. This is possible since users can only switch between the platforms at high costs if they cannot take their data with them. They might not even switch to platform B although it might be significantly more attractive to them because of prohibitive switching costs – they are locked-in. [6] Under the absence of data portability, all effects depicted in Figure 1 would be significantly smaller, if they existed at all.

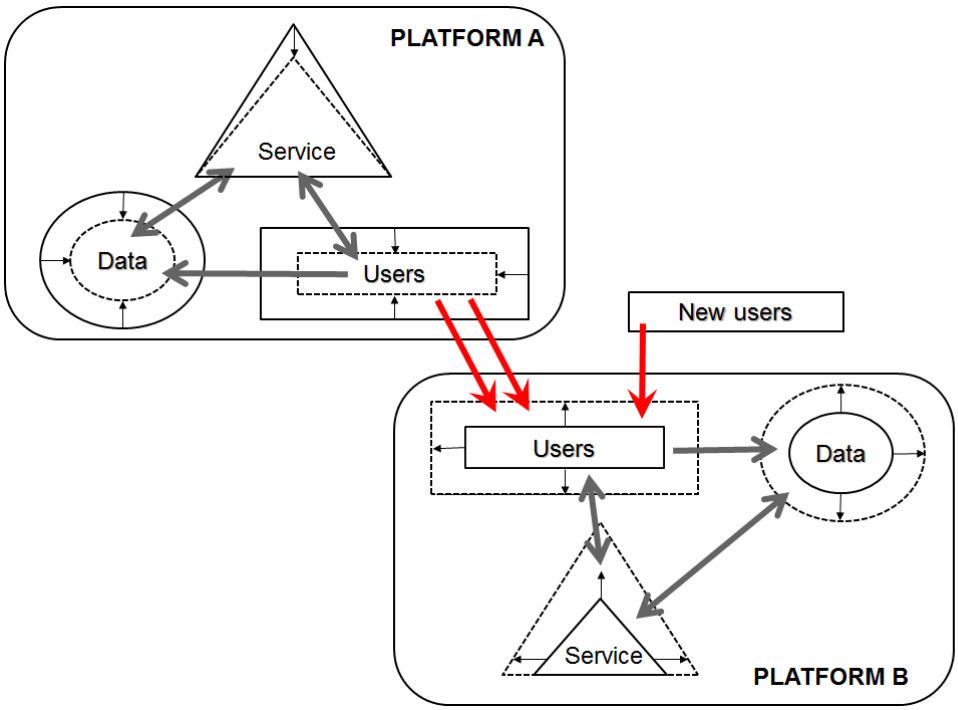

Figure 1: The Platform-Data Model for Substitutes. Solid lines show the initial situation. Dashed lines indicate the situation after platform B has gained market share. Thick arrows show dependencies. Qualitative illustration.

Data portability reduces the risk of customer lock-in, which is desirable in the substitute case if market dominance is abused. By contrast, if there is no abusive anticompetitive conduct, data portability has a potential to harm competition.

Platform A might run the risk of losing customers whenever a competitor with a marginally

better product emerges. This might reduce the incentive to innovate due to smaller returns on investment. Also, platform B might not enter the market under data portability because of prohibitively high investments required for data to be portable, again reducing competition and innovation. Companies may have an even stronger incentive to innovate when low levels of data portability promise high profits to the company that beats all is competitors.

What is more, as data needs to be portable in a "structured, commonly used format" (European Parliament and European Council, 2016), data portability may lead to uniformity and hence the use of a single technology for a longer period of time than economically efficient. Requiring specific formatting risks replacing innovation in proprietary standards with consistent but inflexible government-mandated standards that deter the development of new kinds of formatting and data handling (Yoo, 2012).

By contrast, there might be cases where the incentive to innovate for new entrants increases under data portability because it is easier to attract customers when the customers know that their data invested in the incumbent platform is not lost. Allowing consumers to move their data to different providers might as well create new business models. As data is an important production factor in digital markets, innovation might be significantly facilitated if this production factor is easily and quickly available through data portability. To sum up, under data portability, there is a trade-off between smaller returns on investment on the one side and lower risk and lower investment necessities on the other side.

4.2 PLATFORMS OFFERING COMPLEMENTS

In the second case, the platform market is determined by two platforms A and B that offer complementary products (Figure 2). Platform A is again regarded as the incumbent platform. Platform B gains market share by offering a product that is complementary to platform A's product.

Under data portability, if the number of users of platform B increases, it is likely that the number of users of platform A will increase as well, since it becomes more attractive to use platform A's products in combination with platform B's products (positive external effects). Users can easily transfer data back and forth between both platforms since switching costs are likely to be low due to data portability, unless other factors drive up switching costs. There might also be a significant amount of new users entering the market that both platforms benefit from. Accordingly, the volume and quality of data will increase for both platforms. The products of both platforms will gain in quality (higher triangle) and variety (broader triangle). Apart from the mutual benefit of platforms A and B, the emergence of new business models is probable. Innovation might be significantly strengthened by data portability as the platform's investment in the collection and processing of data might be significantly reduced when shared over several platforms offering complementary products. Apart from this, the potential effects of data portability on innovation are similar to those discussed in the substitute case.

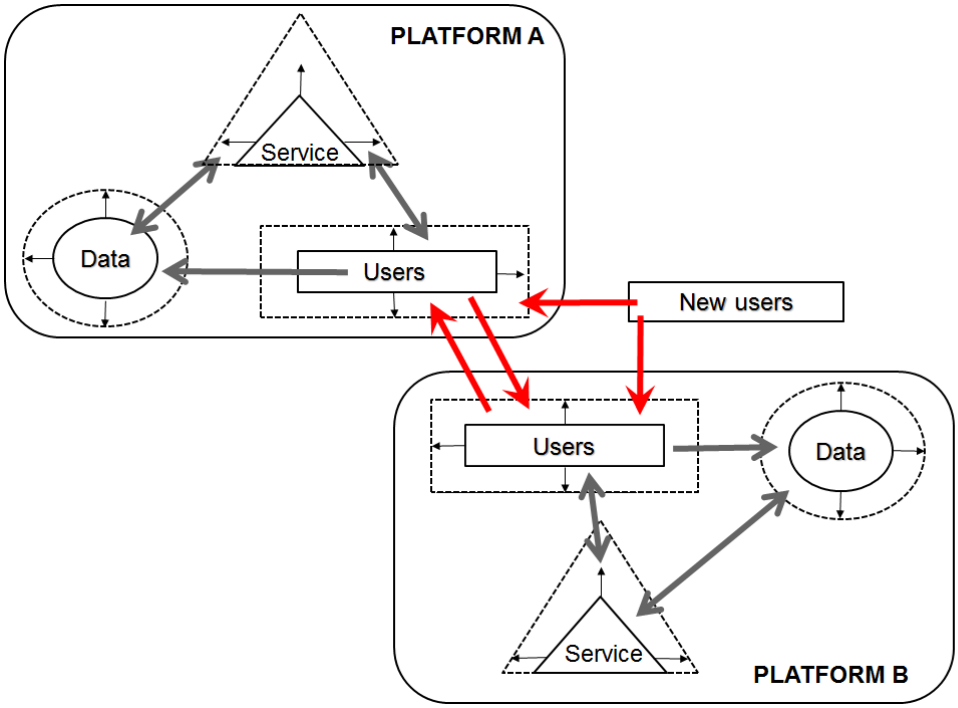

Figure 2: The Platform-Data Model for Complements. Solid lines show the initial situation. Dashed lines indicate the situation after platform B has gained market share. Thick arrows show dependencies. Qualitative illustration.

Additional platforms might appear on the same or on other platform markets. An example for a potential new business model based on data portability is an energy-price comparison platform that could make recommendations based on the exact usage pattern of the respective household which is transferred to the platform by smart home technologies. In this particular case, however, it could also be possible that energy companies lose customers to competitors once these customers get recommendations based on their usage pattern.

Without data portability, it can be expected that the increase in users for platforms A and B will be significantly less pronounced, if positive spillovers exist at all. Potential mutual benefits are lost. The emergence of new business models is less likely.

In theory, platforms offering complementary products should have an interest in making their data portable in order to be able to extract positive synergy effects and benefit from their mutual existence. Regulatory action in the form of a right to data portability should therefore not be required in this case. As a matter of fact, however, even with these platforms, data is often not portable. This is partially due to the fact that information asymmetries exist and potential synergies oftentimes remain unknown. To overcome these information asymmetries, regulatory action is a potential way out. Making data portability obligatory could help platforms realise potential synergies. Furthermore, where data portability is already part of a platform cooperation as with PayPal and Vinted, the regulation on data portability bases this business conduct on broader legal grounds.

Based on the above platform-data model simulations, it is recommendable or at least not harmful to competition to make data portability obligatory when platforms offer complementary services. Furthermore, data portability can be recommendable when market players offer substitute products and one player is dominant due to anticompetitive conduct.

Table 2: Correlations in the platform-data model. Effects of an increase in the amount of users

of platform B (marked by + (1st) to indicate that this happens first) on the amount of users of platform A, the data volume and quality and product variety and quality of platforms A and B.

		Data		Product		Data portability
	Users	**Volume**	**Quality**	**Variety**	**Quality**	
Platform products are substitutes.						
Platform A	–	–	–	~	–	Recommended in case of anticompetitive conduct
Platform B	+ (1st)	+	+	+	+	
Platform products are complements.						
Platform A	+	+	+	+	+	Recommended / not harmful
Platform B	+ (1st)	+	+	+	+	

By contrast, where there is no market dominance by anticompetitive conduct in the substitute case, be it because there is no market dominance at all or because the dominant platform is superior by virtue of superior products, data portability should not be made an obligation but rather enforced through competition law if necessary. In this case, data portability would place a burden particularly on small companies that might preclude them from realising innovations due to reduced returns on investment. This would harm competition and eventually consumer welfare. Table 2 summarises the correlations in the platform-data model.

These conclusions, however, have to be interpreted in a nuanced fashion. Whether data portability enforces competition and strengthens innovation depends on the timeframe and on the type of innovation. In the short run, competition will likely be increased by data portability, since it generally facilitates the entry of new companies into the market. In the long run, however, the market will probably be less fragmented again. Users will eventually switch to the platform where they can maximise their utility, which is a competitive outcome.

As regards innovation, disruptive innovation might particularly benefit from data portability since it generally involves higher risks and investments and one main investment factor, data, would be relatively cheap under data portability. A platform provider might rather be willing to establish a disruptive platform knowing that potential users can easily switch to this disruptive platform. The relative benefits for sustaining innovations are probably smaller given that the subjective risk of this innovation is relatively lower.

In order to provide a coherent policy recommendation, it needs to be identified what determines anticompetitive conduct and in which platform markets the risk for anticompetitive conduct is high.

4.3 DETECTING ANTI-COMPETITIVE BEHAVIOUR

Anti-competitive behaviour in online markets often implies exploiting the peculiarities of platform markets, namely the concentration forces as described by Evans and Schmalensee (2007). In markets where the potential concentration is high, the risk that a company exploits market concentration forces is high as well. Table 3 summarises the expected degree of market concentration forces for online marketplaces, social networks, and search engines. Based on the strength of the concentration forces, a so-called concentration score is determined that indicates the average degree of market concentration and hence the likelihood of its abuse. [7]

Table 3: Market Concentration Forces. Strength of market concentration forces for different types of platform markets. The concentration score indicates the degree of market concentration, with 1 ≤ score < 1.75 indicating low market concentration, 1.75 ≤ score < 2.5 indicating medium market concentration, and 2.5 ≤ score < 3 indicating high market concentration.

	Effect on concentration	Search engines	Online marketplaces	Social networks
Direct network effects	+	low 1	low	high
Indirect network effects	+	high 3	high	medium
Economies of scale	+	high 3	high	medium
Differentiation	–	low 3	high	high
Congestion	–	low 3	medium	medium
Switching costs	+	medium 2	high	high
Market concentration (score)		high (2.5)	medium (2.17)	medium (2.17)

Search engines: In search engine markets, three main user groups need to be distinguished, namely searchers, advertisers and content providers. Direct network effects do not play a role for searchers, since there is no direct interaction between them. The users of a search engine do not directly benefit from the search engine being used by other searchers. For advertisers, there are direct network effects, but they are not positive. The more advertisers a search engine has, the less attractive it becomes for other advertisers, since advertising space is limited and the price for advertising increases with the number of advertisers. The same applies to the platform side of content providers. The more websites are crawled by a search engine, the less likely it becomes that a specific website will appear at the top of the results list and be called up by users (Monopolies Commission, 2015, p. 56). In sum, search engine markets are considered to have low positive direct network effects.

Indirect network effects play an important role in search engine markets. The more searchers a search engine has, the more attractive it becomes for advertisers. For them, the value of a search engine increases with its ability to show targeted advertisements. Indirect network effects may also be negative between advertisers and searchers if there is too much advertising (congestion). Content providers on search engines benefit from positive indirect network effects to the extent that websites can only be optimised in terms of the individual requirements of a search engine. [8] In sum, positive indirect network effects are considered to be high in search engine markets.

Economies of scale are high for search engines. As Bracha and Pasquale (2008) note, fixed costs often run into the billions, since the web index needs to be created, the search algorithm developed and the computing centres built. The variable costs for a search are relatively low. The degree of differentiation is low for search platforms. Search engines can only differentiate in offering different levels of privacy and slightly different search surfaces. [9] Capacity constraints do not limit the growth of a search engine. Server capacities can be expanded to answer more search queries and index more websites. Though advertisement space per search is limited, the possibilities to advertise increase with the number of search queries (Monopolies Commission,

2015, p. 58).

Switching costs are often considered to be relatively low in search engine markets. In fact, it is relatively easy for searchers to use several search engines simultaneously. However, the search history is generally not portable, but might help to find more customised results. In consequence, using the same search engine repeatedly can be beneficial for searchers. Furthermore, familiarisation effects play a role. For advertisers, switching costs between search engines are high. There have been attempts on the part of search engines to use exclusive contracts or technical restrictions to limit the portability of ads. For content providers, multi-homing is easy, since they can make their websites crawlable for several search engines at the same time. In sum, the degree of switching costs is considered to be medium.

Online marketplaces: There are two main groups of trading platform users, namely buyers and sellers. Direct network effects are subordinate for online marketplaces and trading platforms, since there is no direct interaction between the users of one platform side, unless the trading platform trades used goods for private individuals. On a platform like Vinted, buyers can assume the function of sellers and sellers the function of buyers. On the seller side, negative direct effects can occur, since each additional seller implies more competition. There are also negative direct effects on the side of buyers, particularly with auction platforms, since the competition for a product increases with each additional buyer. In sum, positive direct network effects are considered to be low or even zero for online marketplaces. Indirect network effects are strong in online marketplaces. Each seller benefits from a larger number of potential buyers since the likelihood of selling products increases, and each buyer benefits from a larger number of sellers since they can choose from a larger range of products. Economies of scale occur with trading platforms since operating a trading platform entails relatively high fixed costs, for instance because of managing databases, while the variable costs triggered by additional transactions are relatively low. [10]

Differentiation possibilities are manifold in online marketplaces. Not only can platforms carry a limited product range and specialise in certain products, but they can also offer different designs, payment options and rating systems. Capacity constraints and congestion play a subordinate role in trading platform markets. However, a significant excess of sellers and the resulting price competition might deter sellers. The degree of congestion is hence considered to be medium.

Switching costs exist especially for the seller side of trading platforms. Their selling reputation can be considered a platform-specific investment, since it depends on the number of transactions a seller has already completed on a given network. Buyers enjoy relatively lower switching costs. However, switching costs may arise through utilisation fees. In addition, familiarisation with market rules and the handling of a platform as well as inertia may deter buyers from switching platforms.

Social networks: The main sides of social networks are users and advertisers. Direct network effects play a crucial role in this setting. The more users a social network has, the greater is the benefit of the network for the individual user. However, as long as a user can obtain access to his core group of connections, further expansions of network size will provide a marginally small value only. Indirect network effects exist in that a large network with many users is more attractive for advertisers than a small network. By contrast, networks with many ads are not likely to be more attractive to users than networks with few ads since most users find ads distracting. Thus, indirect network effects are classified to be medium in social networks. Economies of scale play a subordinate role in social network markets. While networks need to

establish large server systems, computer capacities can also be rented on short notice, so that high fixed costs need not be prohibitive to market entry. The marginal cost of hosting additional users is low.

The potential for differentiation is high for social platforms. They may differ widely in terms of their target groups, functions and purposes. [11] Congestion might appear on social network platforms, but it is not substantial. Increasing complexity might raise marginal costs. Measures are taken, however, to reduce complexity, for example by filtering news pages using algorithms in accordance with individual user's interests (Monopolies Commission, 2015, p. 72).

Switching costs are high in social networks. While it is possible to obtain a copy of certain data, transferring a profile to a competing service requires time and effort, since the data is not extracted in a format that can be easily imported into another social network. Contacts and shared information like messages, comments and photographs can often not be transferred to other platforms. Where users cannot communicate across platforms, they have an incentive to join the largest network in order to at least potentially interact with as many users as possible. [12]

All in all, it can be stated that the degree of market concentration and hence the risk of dominance abuse is particularly high in search engine markets. In trading platform and social network markets, the degree of market concentration is medium, but with a potential of tipping to high concentration. In these markets, the appropriateness of data portability should be decided upon case-wise, depending on the size of the company in question, since the potential to abuse market dominance increases with firm size.

5. POLICY RECOMMENDATIONS

The nature of the effects of data portability on competition and innovation is a very complex one, such that even the clear conclusions of the above analysis need to be interpreted carefully. According to this analysis, data portability is generally rather recommended in cases where platforms offer complementary products and in cases where platforms offer substitute products and the risk of anti-competitive conduct is high. The risk of anti-competitive conduct is particularly high where market concentration is high, which has been determined to be the case in search engine platform markets. Therefore, search engines should be the focus of a data portability regulation, while trading platforms and social networks should rather be only obliged to make personal data portable in case they offer complementary or substitute products and are particularly large. In all other cases, a strict implementation of the right to data portability is rather not recommended.

The general right to data portability as included in the General Data Protection Regulation should therefore be interpreted in a nuanced fashion such that it does not ossify what is – because of new technologies and data analysis on a massive scale – a highly dynamic and evolving market. Data portability could significantly strengthen innovation by making data more available - but it could also hamper innovation by making data too available. A clear correlation is not detectable and thus should also not be suggested by the GDPR.

It should be kept in mind that, apart from the *ex ante* regulation of the right to data portability, the ex post enforcement of antitrust violations through competition law is also possible. Frank H. Easterbrook (1984) demonstrated that errors on the side of overlooking anti-competitive

conduct were preferable to errors on the side of condemning beneficial practices, since anti-competitive practices and monopoly rents create incentives for market entry and for innovation to overcome the incumbent's exclusionary practices. As Spulber and Yoo (2013) predict, the demand for continued innovation will erode any temporary market power and force companies to constantly invest in new features. Although platform markets tend to tip into a winner-takes-all outcome, the positions of the "winners" are contested as they are challenged by disruptive innovators that change the boundaries of the market in a regular fashion ("competition for the market"; Geroski, 2003).

In other words, multi-sided platform issues should be approached with more caution, relying on the self-correcting powers of the market provided that certain values such as privacy and security are protected by flanking policy frameworks like the GDPR. Tailored interpretations of the right to data portability that consider the type of platform market as well as the risk of market dominance abuse avoid that the GDPR might act as a barrier to the development of new digital business models, unintentionally damaging innovation and competitiveness. Further empirical research on competition effects of data portability is crucial.

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FOOTNOTES

1. The legal text as contained in article 20 of the GDPR is as follows: "1.The data subject shall have the right to receive the personal data concerning him or her, which he or she has provided to a controller, in a structured, commonly used and machine-readable format and have the right to transmit those data to another controller without hindrance from the controller to which the personal data have been provided, where: (a) the processing is based on consent pursuant to point (a) of Article 6(1) or point (a) of Article 9(2) or on a contract pursuant to point (b) of Article 6(1); and (b) the processing is carried out by automated means. 2. In exercising his or her right to data portability pursuant to paragraph 1, the data subject shall have the right to have the personal data transmitted directly from one controller to another, where technically feasible. […]"(European Parliament and Council, 2016).

2. For instance, data about the interests and needs of users enable a platform provider to offer better targeted advertising services to advertisers who want to display their advertisements to users who are interested in buying their product. By knowing the user well through the collected data, search engines can deliver results that are relevant to the specific user based on former search queries and location. Online trading platforms can give product recommendations based on previously purchased or viewed products. Social networks select posts and tailor ads to their consumers presumed interests.

3. In contrast to the traditional definition of complementarity (Shy, 2001), complementarity here means that one good can be consumed together with another good, but does not have to.

4. Data quality is assumed to be positively correlated with the number of users since more users imply more heterogeneity and this, in turn, implies a broader, more differentiated database.

5. The competition effects will differ depending on whether the platform users multi-home or switch, i.e. whether they use the emerging platform B in addition to platform A or instead of platform A. If users multi-home, the increase in platform B users is the same as in the switching scenario, but the decrease in platform A users is not as pronounced as in the switching scenario.

6. For instance, the fact that the privacy policy changes of social networks like Facebook have not led to a direct decline in users despite the fierce opposition that these changes have caused on the part of the users, may indicate lock-in (Waller, 2012).

7. Effects highly enforcing concentration are rated with a score of 3, effects only weakly enforcing concentration are rated with a score of 1. For example, as congestion leads to less concentration, low congestion implies higher concentration than high congestion and is therefore rated with a score of 3.

8. Search engines with many users are therefore particularly attractive for content providers (Monopolies Commission, 2015, p. 56).

9. The search engine DuckDuckGo does not collect and process personal data, in contrast to many other search engines, for example.

10. Also the collection of data on searchers' search behaviour leads to significant economies of scale. The more data a search platform has, the better it can adjust its search algorithm and the advertising to match the searchers' interests. This learning effect causes more searchers to use the search platform and enables the achievement of even higher advertising turnover (Monopolies Commission, 2005, p. 55).

11. Some (e.g., LinkedIn, Xing) are platforms for professional networking, Facebook is mainly used for private networking (except when considering official pages for companies or public figures), Instagram and Flickr are used to share images and videos and Twitter for sharing short messages.

12. Unlike in platform markets with low user retention, it is insufficient in social networks for a competitor to merely offer slightly higher quality to entice a sufficiently large number of users to switch providers. An alternative social network would have to compensate for users' higher switching costs by offering much higher quality. Even if users had the possibility to transfer their data to a new service they might still feel reluctant to leave a social network when their friends are not coming with them and they lose their connection with them.