

Digital Platforms: a practical framework for evaluating policy options*

Pieter Nooren¹, Nicolai van Gorp² and Nico van Eijk³

Abstract

The increasing economic and societal impact of digital platforms, such as Google, Apple, Uber and Airbnb, raises a number of questions for policy makers. On the one hand, digital platforms offer efficiencies and opportunities for innovation. On the other hand, they challenge existing policy frameworks by disrupting markets. Questions are raised whether the current regulatory approaches and instruments suffice to promote and safeguard public interests. We have developed a practical framework that provides structure and guidance to policy makers who design policies for the digital economy. Our framework differs from other approaches in that we take the digital business models of platforms as the starting point for our analysis. The framework consists of three pillars:

1. **Platform characteristics** that capture the various technical and business aspects of platforms, such as the revenue model (direct payment, advertising, revenue share), network effects, use of data (internal, external, curation/editorial control) and dependence of other companies on a platform.
2. **Public interests** categorized in four broad areas: competition and innovation, consumer interests, freedom from improper influence, and integrity and continuity of applications.
3. **Policy options** broadly divided in three categories: removing obsolete instruments, using existing instruments (e.g., enforcing them stricter, tailoring their application to the digital economy) and adopting new instruments.

The analysis of a platform case starts with determining the platform characteristics, relating each of these to the public interests, and formulating policy options. Then, the framework invokes a return-path analysis for assessing a) how the interventions affect the business model, b) whether it has the desired effect on public interests, and c) does not have undesired side-effects on public interests. In this way, the analytical framework gives policymakers a practical tool for consistent and balanced decision making in the context of digital platforms. The framework has been applied to a number of case studies in the European context and puts forward two key messages for the current national and European discussions on digital platforms. First, one should look at the underlying characteristics of platforms rather than trying to deal with digital platforms as single category. In particular, policy makers should steer clear of attempts to force digital platforms into a single category, as the positive and negative impacts on public interests differ from case to case. Second, policy makers should explore existing rules and policy options, as they seem fit to deal with several characteristics of digital platforms in a time frame that matches the rapid development of platform technologies and business models.

* This paper is based on a study commissioned by the Dutch Ministry of Economic Affairs. It was carried out by TNO, Ecorys and the University of Amsterdam and captured in the report 'Digital platforms: an analytical framework for identifying and evaluating policy options', by N.A.N.M. van Eijk, R.F. Fahy, H. van Til, P.A. Nooren, H.M. Stokking and H.F.B.F. Gelevert. This paper has also been accepted for the TPRC44 conference, to be held in Arlington, Virginia, September 30 – October 1, 2016.

¹ TNO, P.O. Box 96800, 2509 JE Den Haag, The Netherlands, pieter.nooren@tno.nl

² e-Economics, Maurice van Kleefstraat 16, 3069 RZ Rotterdam, The Netherlands, nicolai@e-economics.eu

³ Institute for Information Law (IViR), University of Amsterdam, PO Box 1030, 1000 BA Amsterdam, The Netherlands, n.a.n.m.vaneijk@uva.nl

Contents

- Contents 3
- 1 The rise of the platform economy and the impact on public interests..... 5
- 2 An analytical framework for digital platforms..... 6
 - 2.1 Platform characteristics..... 6
 - 2.1.1 Revenue model..... 7
 - 2.1.2 Direct and indirect network effects..... 8
 - 2.1.3 Economies of scale and scope 9
 - 2.1.4 Use of platform by other applications or platforms..... 10
 - 2.1.5 Horizontal integration 10
 - 2.1.6 Vertical relations/integration 10
 - 2.1.7 Geographical dependencies 11
 - 2.1.8 Product and services market affected..... 11
 - 2.1.9 Generation and use of user data 11
 - 2.1.10 Curation of data and content 11
 - 2.2 A coarse typology of digital platforms 12
 - 2.3 Public interests 13
 - 2.3.1 Sufficient competition and innovation..... 14
 - 2.3.2 Safeguarding consumer interests..... 14
 - 2.3.3 Freedom from improper influence..... 14
 - 2.3.4 Integrity and continuity 14
 - 2.4 The relation between the platform characteristics and public interests..... 15
 - 2.4.1 Platform characteristics and ‘competition and innovation’ 15
 - 2.4.2 Platform characteristics and ‘consumer interests’ 15
 - 2.4.3 Platform characteristics and ‘freedom from improper influence’ 16
 - 2.4.4 Platform characteristics and ‘Integrity and continuity’ 16
 - 2.5 Instruments 16
 - 2.5.1 Existing instruments 17
 - 2.5.2 Application and enforcement..... 18
 - 2.5.3 Static/dynamic market regulation..... 18
 - 2.5.4 Ex ante and ex post regulation 18
 - 2.5.5 Subsidiarity 19
 - 2.6 Instruments and enforcement 19
 - 2.6.1 Remove instruments 19
 - 2.6.2 Continue current application of existing framework 20
 - 2.6.3 Re-interpret application of existing framework 20
 - 2.6.4 Stricter enforcement of existing framework..... 20
 - 2.6.5 New instruments 21
- 3 Illustration of the framework with forward and return-path analysis 22
 - 3.1.1 Summary of Facebook’s business and activities 23
 - 3.1.2 Forward path: Facebook’s platform characteristics and relation to public interests ... 23

3.1.3	Return path: from a proposed instrument to impact on platform characteristics and public interests	25
4	Conclusions.....	26
4.1	A structured approach for the analysis of government roles and policies	26
4.2	Platform characteristics rather than a typology	27
4.3	Platform characteristics rather than a definition of digital platforms	27
4.4	Many existing instruments apply to digital platforms	27
	References.....	29

1 The rise of the platform economy and the impact on public interests

The Internet is driving the development of the so-called platform economy [1]. Digital platforms provide a basis for delivering or aggregating services and content from service and content providers to end users. These basic operating principles are found in platforms in a variety of sectors and they are also reflected in other definitions of digital (or: on-line) platforms, such as that proposed earlier by the European Commission [2]. In what we can now consider as the early days of digital platforms, they tended to restrict themselves to sectors with natural ties to the Internet (for example, Google search), communication (Skype, WhatsApp), media (YouTube and Vimeo) and e-commerce (Amazon, Zalando). The link between platforms to the physical world that first appeared in e-commerce has grown much stronger as the Internet and platforms have progressed into many other sectors such as mobility (Uber), hotels and accommodation (booking.com, Airbnb) and home automation (Google Nest, Apple). In parallel to the activities of the well-known large platforms that operate at a global scale, there are many national and local platforms, ranging from national e-commerce activities to not-for-profit sharing economy initiatives. Some of the larger platforms seem to develop themselves into conglomerates of interconnected platforms, of which several have become dominant market players in relatively short periods of time.

Digital platforms put pressure on existing government policies for stimulating innovation and economic development and for safeguarding public interests. Platform owners present themselves as bridge builders or gatekeepers, intermediating between parties on different sides of the platform. Their platforms offer new and attractively priced services to consumers, but at the same time they affect the possibility for new players to enter the market and change the ways consumers interact with services and service providers. For these reasons, digital platforms currently are of particular interest to policy makers. They wish to understand the positive and negative impacts that these platforms may have on public interests in order to be able to determine if, how and when to intervene. Examples of the policy questions on the table include what opportunities these platforms present for innovation, how they can promote the transparency of markets, how they may impact freedom of choice for consumers, how they affect freedom of speech and how they treat personal data of users. The European Commission has explored such questions and their background in its September 2015 consultation [2] on the regulatory environment for platforms. The responses fed into its approach to on-line platforms announced in May 2016 [3] that describes the principles that the Commission will take into account in its elaborations on platforms. Together with a number of further steps that the Commission envisages, this in effect provides a roadmap for further policy development and indicates that these types of questions will be on the table for the years to come. In parallel with the Commission's work, studies on the economic and social effects of platforms have been carried out at the national level ([4],[5],[6],[7],[8]).

The framework presented in this paper aims provide structure and guidance to policy makers who design policies for the digital economy and digital platforms in particular. It has been developed at the request of the Dutch Ministry of Economic Affairs [9]. The remainder of this paper is structured as follows. Chapter 2 describes the framework itself. It shows how well-known concepts from

economic literature (such as network effects and economies of scale) prove to be very relevant as platform characteristics and that they can be used as the starting point for analyzing the effects of platforms on public interests, such as competition and innovation. This is illustrated by the case studies that were used in the development of the framework: Apple, Facebook, Netflix, Thuisafgehaald¹ and Bol.com^{2,3}. For policy makers and regulators, the positive and negative effects that platforms can have on public interests form the basis for their considerations on policy instruments and their application. Chapter 3 outlines how the framework is applied in practice, emphasizing the need to use a return-path analysis to ensure that instruments chosen to promote or safeguard particular interest do not have undesired and unacceptable effects on other public interests. Chapter 4 summarizes how the framework promotes completeness and consistency in policy development and emphasizes the two key messages for policy makers that emerged during its development: (1) consider the underlying characteristics of platforms and business models rather than trying to deal with digital platforms as single category and (2) explore existing instruments and options that can be applied to digital platforms before considering new rules

2 An analytical framework for digital platforms

2.1 Platform characteristics

The starting point of the framework is provided by the business models used with digital platforms. Rather than trying to come up with a generic definition of platforms, the focus is on how business models use and operationalize platform economics. Our approach is motivated by the heterogeneity of platforms and business models that we observe. Developers of digital business models make different strategic choices in how they internalise demand externalities (i.e., exploit direct and indirect network effects). This choice is made simultaneously with other strategic choices related to the business model: what revenue model to adopt (direct payment, advertising, revenue share)? How to use data (internally, externally, curation/editorial control)? How to manage vertical dependencies throughout the value chain (platform of platforms, vertical integration)? Are there economies of scale and scope to be exploited? A generic definition of platforms does not contribute to the understanding of the impact of these choices on public interests such as competition and innovation, and end user protection. On the contrary, a quest for an all-encompassing definition carries the danger that the discussion and analysis is restricted to the definition itself and does not address the public interests involved.

In the following sections, we introduce the key platform characteristics that we have identified. In the graphical representation of the framework (Figure 1), the characteristics are in the second column.

¹ Thuisafgehaald is a Dutch sharing economy platform for sharing of home-cooked meals. The platform links cooks to people looking for a meal and vice versa. The platform operates in a number of countries and languages.

² Bol.com is a large Dutch e-commerce platform.

³ The cases studies have served to validate and refine the analytical framework, in particular how it captures the platform characteristics and public interests. The goal was not to evaluate whether there is a need for more (or less) government intervention in the specific cases.

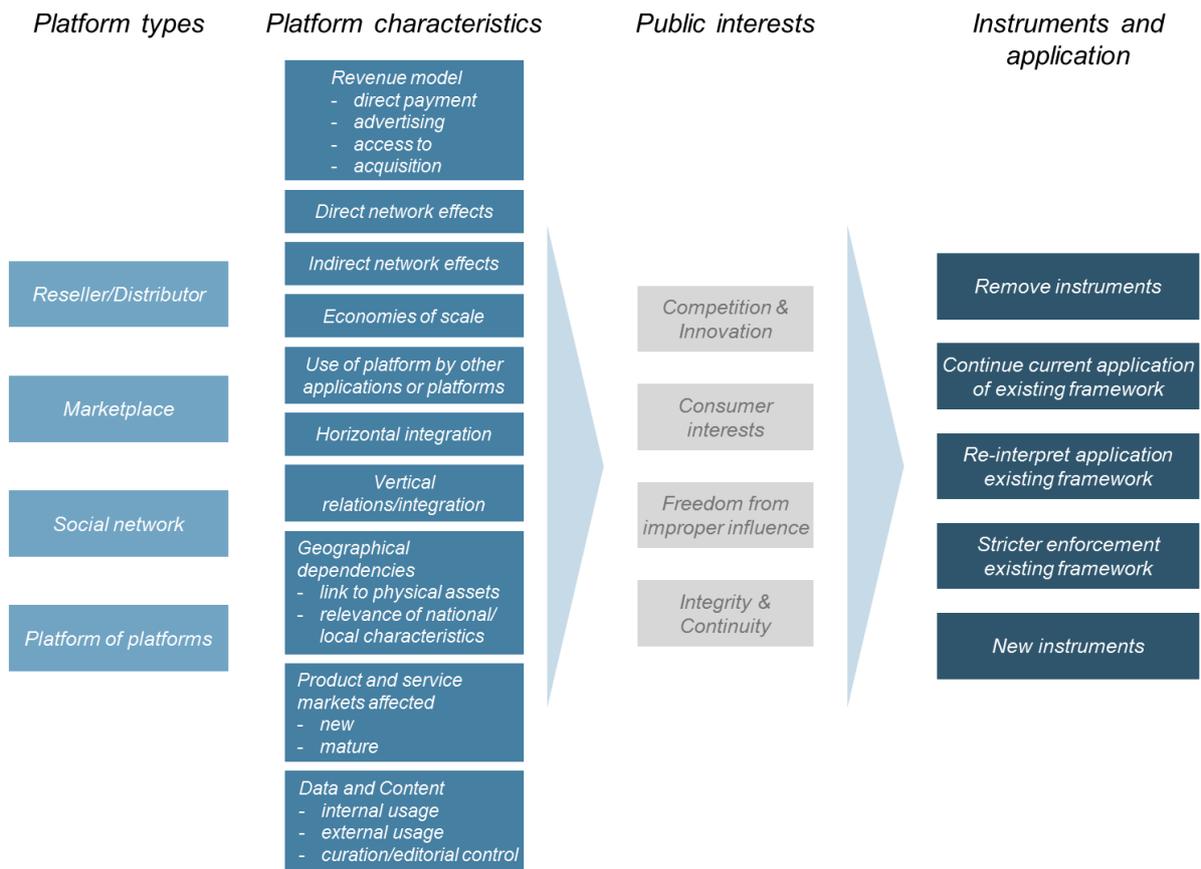


Figure 1. Overview of the framework.

2.1.1 Revenue model

Peitz and Valletti [10] identify three types of digital (platform-based) business or revenue models for on-line service providers. Note that platforms can also use a mix of these revenue models.

- Direct payment** – The platform charges users for its service or product. Well-known examples are Netflix (that sells subscriptions to its video service) and e-commerce platforms such as Amazon (where users pay for products they buy on the platform). Apple and Microsoft also have a direct payment model for the hardware and software they sell.
- Advertisement model** – Platforms provide a service, and consumers indirectly provide revenues by being exposed to advertising. Moreover, by using personal data, the platform can improve the advertising effectiveness.
- Access model** – Platforms based on the access model connect app and content developers to users (e.g., Apple’s App Store). Here, the platform may charge those app and content developers for selling their product or service to users. Similarly, the platform provider may charge users on behalf of the app and content developers. Thus, the platform mediates between suppliers and consumers.

Some of the newly founded platforms do not seem to generate revenue at all. Their primary purpose is to experiment with a business model or a technology, try to build a mass of users, while postponing the goal of financial viability. The latter is realized at a later stage when the company has

realized sufficient scale and has figured out which of the above mentioned revenue models is most profitable, or when it is purchased by another company offering complementary services (e.g., as in the recent acquisition of LinkedIn by Microsoft). Because these kinds of acquisitions are common for digital platforms, a fourth revenue model is added to the typology of business models:

d) Acquisition or growth model – platforms aiming to create future value by developing platform technology and by amassing users on the platform without a business model that generates a sustainable revenue stream.

Despite the lack of current revenues, the role of these types of platforms should not be underestimated as they can grow rapidly and become future challengers of other platforms.

2.1.2 *Direct and indirect network effects*

A characteristic shared by many digital platforms is that they internalize demand externalities within or between different user groups ([11],[12]).

- Demand externalities *within* user groups result in a **direct network effect**, meaning that a platform becomes more attractive for users as the total number of users on the same side of that platform grows. Direct network effects are typical for social networks and communication applications like Facebook, LinkedIn, WhatsApp and Skype.
- Demand externalities *between* user groups result in an **indirect network effect**, meaning that a platform becomes more attractive for one group of users (e.g., advertisers) as another group of platform users (e.g., consumers) grows. Indirect network effects are typical for platforms that facilitate transactions (like Amazon and Booking.com) and platforms with an advertisement based revenue model (like YouTube).
- Platform owners can also choose to exploit both types of network effects (e.g., Facebook) or none at all (e.g., Netflix)⁴.

Several articles from the 1970s and 1980s already explained that network effects may result in winner-take-all market outcomes ([13],[14],[15]). During the 2000s, following the seminal work by Rochet and Tirole [16], the term *platform* has become almost a synonym for *network effects* and platforms without network effects are often not considered as platforms. However, from a technological point of view, any technological basis for delivering (multiple) goods and services to end-users can be considered to be a platform, whether or not its operator chooses to internalize demand externalities. It then follows that there are four basic models for operating a digital platform (Figure 2):

1. One-sided without network effects
2. One-sided with direct network effects
3. Two-sided with indirect network effects; and
4. Two-sided with indirect and direct network effects.

⁴ Netflix' users benefit somewhat when the number of users grows because this may contribute to an improved quality of Netflix' recommendations; as such, this does represent a limited direct network effect.

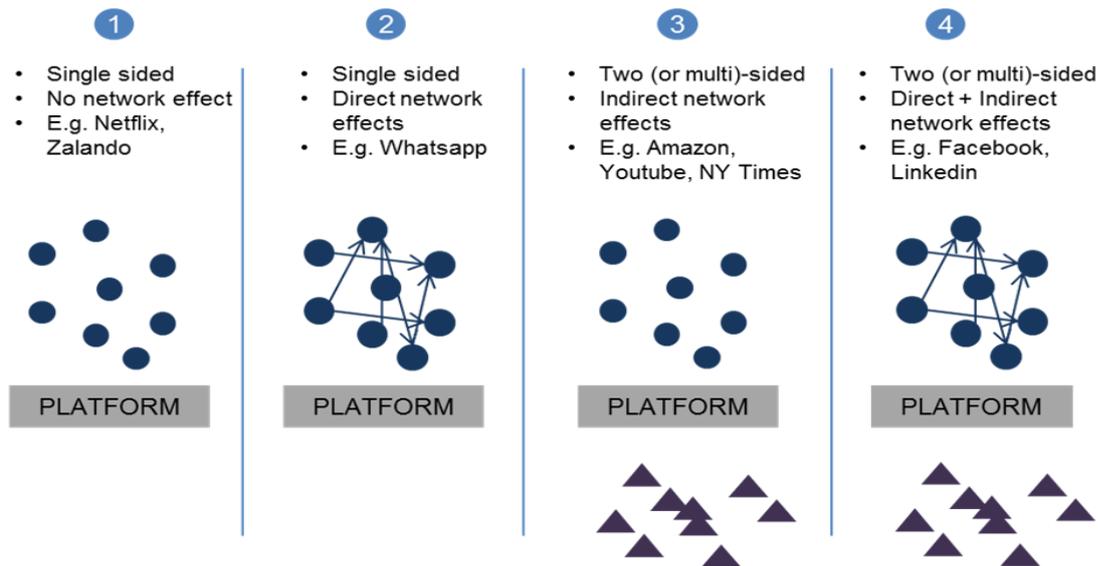


Figure 2. Basic business models for platforms based on direct and indirect network effects (illustration courtesy of Ecorys Nederland).

Business models may change over time and so does the way in which a platform is operated. Netflix is currently acting as a reseller of content and is running a business model of type 1, but it may allow its users to interact (become a type 2) or open its platform for advertisers (type 3). For example, Netflix could exploit strong indirect network effects if it would decide to open up its platform for advertisers⁵.

2.1.3 Economies of scale and scope

Economies of scale mean that the average cost decline as the number of users increases. For example, when a platform has a very large and growing user base, it is likely able to negotiate lower input prices (e.g., license fees). Economies of scale are not unique to digital platforms as in many industries the cost per unit diminishes when output increases, but the effect is more pronounced for digital platforms as the marginal costs are often close to zero. We note that the difference between network effects and buying power is not always clear. Network effects arise due to demand externalities and scale economies result from the cost structure. However, when a large user base (resulting from network effects) leads to better buying conditions, this affects the cost structure. Both economies of scale and network effects can result in a market with a few dominant players.

Economies of scope imply that the average cost decline as more different goods and services are offered. Scope economies are very important in business models that run on mining and processing of (big) data. The ability to compete increases when a company has multiple platforms in different areas and creates synergies by linking platforms through user data. By combining user data from multiple platforms, a multi-platform operator can optimise the experience for both end users and advertisers across all platforms. At the same time, each platform can be regarded as an additional vein in the company's data mine. As such, the operation of multiple interlinked platforms creates

⁵ Note that Netflix explicitly rules out using an advertising business model in its strategy (at <https://ir.netflix.com/long-term-view.cfm>), making this example unlikely to materialize for now.

multiplier effects [17]. Because of this multiplier effect, there is a risk that digital platform operators can make themselves indispensable for both end-users as well as advertiser/retailers and place themselves in a gatekeeper position. Moreover, control over the multi-dimensional dataset also allows the company to leverage this asset into other markets (e.g., home automation, automotive, etc. [18]). Data-driven scope economies may thus allow a company to innovate in areas that may appear unrelated from the end-user perspective (in terms of substitutability or complementarity). Similarly, data-driven scope economies may give rise to mergers and acquisitions of seemingly unrelated services.

2.1.4 Use of platform by other applications or platforms

Considerable effort may be involved in integrating an acquired service with an existing suite of services. An overlapping user base facilitates integration and hence the opportunities for scope economies. Overlapping user bases are likely for operators of platforms on which apps or platforms from others are thriving [9]. Such platform of platforms may potentially act as a gatekeeper when it controls vital assets for the functioning of other platforms. These assets can consist of an operating system (including application stores) or a user-base. Well known examples of platforms of platforms are the operating systems of Google, Apple and Windows.

2.1.5 Horizontal integration

As explained above, horizontal mergers and acquisitions may be motivated by data-driven scope economies. However, as in regular industries, mergers and acquisitions may also be motivated by demand side substitutability and complementarity; e.g., Facebook's take-over of Instagram and WhatsApp. Although the Commission did not regard the services offered by Facebook and WhatsApp to be substitutes [19], some have argued that had the Commission based its decision on a more forward-looking analysis, it would likely have come to a different conclusion [17]. The argument goes that as digital market boundaries are in constant flux due to the dynamics of digital business models, substitutability or complementarity of services should not be assessed in terms of 'today' but rather in a forward-looking perspective. As such, a horizontal merger may be pre-emptive in nature, even if the services seem unrelated today and even when the acquired company's market share is still relatively small.

2.1.6 Vertical relations/integration

Vertical integration is often employed to internalize transaction costs or externalities [20]. In the digital economy, transaction costs are very low so that assets from others (e.g., data centers) can more easily be combined with own assets without integration. In our study, Thuisafgehaald is an example of a platform with limited vertical integration: it does not operate its own data center and has outsourced web and application development. However, vertical integration may also be motivated by having control over a larger part of the value chain. Platforms that make the strategic decision to control a larger part of the value chain combine their digital platform with physical assets such as a distribution network, data servers, the manufacturing of computers and smart phones etc. The physical assets can form a competitive advantage in comparison with platforms that have to contract the goods and services. In our study, Bol.com is an example of an e-commerce platform that has vertically integrated, as it was acquired by supermarket holding Ahold and now uses the Albert Heijn supermarkets chain for distribution.

2.1.7 Geographical dependencies

For digital platforms it is generally relatively easy to act globally due to economies of scale and network effects, but some platforms choose to act in one or a limited number of geographic markets [9]. For platforms that act as a market place, it is often important that users who offer services or goods on the platforms are in close proximity to users that want to use the services or goods. Cultural differences can be a reason to differentiate the characteristics of a platform between countries or regions.

2.1.8 Product and services market affected

Some digital platforms have created new markets that did not exist before, for example the 'market for social networking'. Such digital platforms do not directly compete with traditional industries as they establish new (digital) markets. On the other hand, many platforms that mediate between users often do have an impact on traditional industries. For example, this is the case for e-commerce platforms and platforms that are active in the sharing (or collaborative) economy. In this category, one can distinguish regulated product and services markets and unregulated markets. In developed economies all markets are regulated to a certain extent. However, in some markets government intervention is higher than in other markets. Examples of markets where there is substantial government intervention are the health care market, the labor market and financial markets.

2.1.9 Generation and use of user data

The generation and analysis of data is a key element in most digital business models. Data is mined from the user base and can be used to improve services by offering a better user experience. It can also be used to create new services and it can be sold. A platform can thus be seen as a 'data mine' from which the digital company is excavating data for internal or external use. Internal usage refers to using the data for optimising the experience of platform usage (on either side of the platform) and external usage refers to using the data to provide services to third parties [9]. Most platforms use the data internally as it enhances networks effects: more users generate more data, which can be used to increase user experience, which attracts more users; because the platform has more users and more data, it can deliver better advertisement campaigns and thereby attract more revenues, which in turn can be used to increase user experience, which attracts more users, etcetera ([18],[21]). This chain of causal effects assumes that the algorithm used for processing the data is of a given quality level. However, a company with less data (i.e. less users) but a better algorithm could in principle defeat a company with more data (i.e. more users). The competitive position of a digital platform is thus a function of its dataset (size and dimensions) and its algorithm [22]. With respect to the latter, however, there is an asymmetry between platform operators and users about the quality of the algorithms [23]. The knowledge asymmetry about quality hinders competition between algorithms. It follows that, in theory, competition between digital firms is biased towards building large multi-dimensional datasets rather than improving the quality of algorithms.

2.1.10 Curation of data and content

Platforms on which content is generated by users can choose not to touch any of the content or to screen/edit ('curate') data to bring it into line with the specific policies of the platform. Curation of data is a relevant consideration for platforms that act as a platform for other platforms as they can, for instance, set conditions for access to an application store. Curation of data is also relevant for a

social network such as Facebook, which has policies determining which content is allowed on the platform.

2.2 A coarse typology of digital platforms

It is difficult to capture the heterogeneity of different digital business models in a single definition for ‘digital platforms’. However, it is helpful for the analysis of a particular digital business model to start from a coarse typology of platforms based on the services that are offered. We identify four categories which may serve as an initial guidance for a more detailed analysis. The categories differ in terms of whether there are transactions between users of the platform, whether there is communication between users of the platform, and whether platform is used by other platforms to reach end-users. Depending on the particular revenue model that is applied, these differences determine to a large extent whether or not network effects can be operationalized. This leads to a coarse typology with four categories (Figure 3):

- *Resellers or distributors* provide content or products to end users. There is no transaction between consumers and the (upstream) suppliers of products, hence there are no indirect network effects. Netflix is an example in this reseller category.
- *Market places* facilitate transactions between user groups on the platform. The transactions can include many products and services and marketplaces can therefore have an impact on a wide array of markets. There are indirect network effects between suppliers and consumers. An example is the Dutch e-commerce platform Bol.com that offers retailers the opportunity to use its infrastructure to reach consumers.
- *Social networks* enable social interaction between users that generate and share content, hence there are direct network effects. Depending on the revenue model, there may also be indirect network effects. Prime examples here are Facebook, WhatsApp and Twitter.
- *Platforms of platforms* are platforms or ecosystems on which other platforms work. As an example, Apple clearly has the characteristics of an ecosystem as it provides a platform to access other digital platforms (e.g., Google Maps). Facebook also has some of these characteristics. For example, it offers the opportunity to application developers to build applications specifically for the users of the social network and lets other websites and services make use of its login system.

	Reseller / distributor	Marketplaces (peer-to-peer)	Social networks	Platforms of platforms
Transactions	No	Yes	No	Possible
Communications	No	No	Yes	No
Network effects	No	Indirect network effects	Direct network effects*	(Multiple) direct and indirect network effects

* In case an advertisement based revenue model is applied, there may be indirect network effects between different users and advertisers



Figure 3. A rough typology of platforms based on the services offered, with an indication of the position of the five cases considered in this study.

Note that some business models combine elements of two or more of the service types. E.g., part of Amazon’s business model entails reselling and distributing of items, but Amazon also facilitates transactions between other retailers and consumers. This illustrates that this coarse typology provides only limited guidance and cannot replace the more detailed analysis of the characteristics of individual platforms. In a recent staff working document on Online Platforms, the European Commission outlines five categories, partly overlapping with the four introduced here, and recognizes that different approaches are found within each category [24].

2.3 Public interests

Public interests refer to the interest of a country or community as a whole and their presence in a platform case can be a justification for the intervention of governments in markets. Public interests therefore play a key role in the framework and this is reflected by the central position for the public interests in the graphical representation of the framework in Figure 1. The public interests included in the framework are summarized in Table 1. The starting point for this set of public interests is an earlier analysis by the Dutch Ministry of Economic Affairs [25] that has been slightly fine-tuned to better match the issues related to digital platforms. The four categories reflect the interests of the key stakeholders (market players, consumers, government) and include integrity and continuity as overarching aspects.

Table 1. Public interests and their interpretation in the framework.

Public interest	Interpretation
Sufficient competition and innovation	Ensuring increase of welfare and efficiency through competition and innovation.
Safeguarding consumer interests	Promoting consumer choice, offering sufficient levels of consumer protection and safeguarding fundamental rights.
Freedom from improper influence	Avoiding unnecessary restrictions by governments, while safeguarding societal interests through positive obligations.
Providing integrity and continuity	Market players, consumers and government need to be able to rely on safe and reliable digital communications provided by networks and services.

Public interest theory offers an economic perspective to analyze whether there is a need for government intervention [26]. In public interest theory, market failure is the primary justification for such an intervention. A classic example of a market failure is the existence of external effects. External effects are costs or benefits that a private actor such as a consumer does not take into account, but which do have an effect on others or society as a whole. Other examples of market failure are market power, asymmetric information and economies of scale. If a market failure is identified, the costs (including possible failure of the policies) and benefits of government interventions have to be weighed against the costs (and benefits of doing nothing). Another framework on which the notion of public interests is, or can be, based is the broader normative framework of fundamental rights and freedoms, which is based on ethical and legal norms. There may also be paternalistic reasons to intervene in markets, for example to protect minors or to prevent consumers from taking actions or giving consent to terms and conditions that are not in their best interest.

It is important to recognize at the outset that digital platforms may have both positive and negative effects on these public interests. Indeed, many digital platforms may have important positive effects

on these public interests, such as increasing competition in markets, bringing innovation, increasing consumer choice and providing new methods for exercising fundamental rights.

2.3.1 Sufficient competition and innovation

It is broadly accepted that competition in markets encourages efficiency, enhances innovation, and benefits consumers. However, market players may engage in practices which negatively affect competition, such as abusing a dominant position, entering into anti-competitive agreements, or carrying out certain mergers or acquisitions. Therefore, governments may have to intervene to prevent such practices with the aim to ensure sufficient competition and promote innovation.

2.3.2 Safeguarding consumer interests

Besides the benefits from competition in markets, there are additional consumer interests that may need to be protected, such as freedom of choice, fair contractual terms, protection from improper advertising and sufficient information. Measures to protect these specific consumer interests may have a positive side effect on competition in markets. We see at least three relevant aspects. First, consumers should have a freedom of choice in goods and services, which includes switching (at reasonable costs) to other suppliers. Secondly, there is a public interest in protecting certain consumer rights, such as preventing unfair contract terms, having rules on advertising, sales and guarantees. Moreover, consumers need to be sufficiently empowered to exercise these rights, including having adequate information on the exercise of these rights. Thirdly, there is a public interest in protecting specific fundamental rights, such as a consumer's freedom of expression, right to privacy and right to data protection. Certain activities of digital platforms may have a direct or indirect effect on the exercise of these rights.

2.3.3 Freedom from improper influence

Where it comes to freedom from improper influence, the role of the government is twofold. Based on how this role is generally seen, and has been framed in jurisprudence and policy, government must on the one hand refrain from exercising improper influence. On the other hand, government has a number of justifications (or even obligations) for interfering with digital platforms' and consumers' rights, including to protect national security, public order, health, morals, and the rights of others (such as reputation, intellectual property, privacy, and personal data). Examples of this are: governments need to refrain from improper interference with consumers' rights, and digital platforms' rights. At the same time governments need to carefully assess their positive role/obligations, for example relating to promoting diversity and protection of minors. Digital platforms should respect the individual rights of consumers. In addition, guarantees can be put into place to safeguard specific interests, such as pluralism and diversity.

2.3.4 Integrity and continuity

The functioning of digital platforms and the trust consumers have in them depends to a high extent on the integrity of the services and networks. The same can be said about the continuity in the provision of services and the underlying infrastructure. Technical standards on safe transactions (certificates, encryption) are a way to secure integrity. As digital platforms are highly dependent on cloud infrastructure and telecommunications networks and services, continuity - the uninterrupted availability of the infrastructure - is highly relevant. However, this infrastructure is complicated and involves a multitude of players depending on which element of the value chain is examined [27].

2.4 The relation between the platform characteristics and public interests

2.4.1 Platform characteristics and 'competition and innovation'

Competition refers to interaction among market players that is driven by rivalry in which every actor tries to maximize its long-run profits. Competition may be hampered as a result of market power, but not necessarily. In the absence of market power, firms have much more to gain from innovation in order to “escape” competition [28]. However, Tirole [29] states that “monopoly situations are natural breeding grounds for R&D and if one wants to induce firms to undertake R&D one must accept the creation of monopolies as a necessary evil”. Aghion et al. [30] argue that the relationship between product market competition and innovation resembles an inverted U-shape and they support this idea with empirical analysis. In any case, competition problems arise when rival interactions are not based on merits and a firm is able to set terms and conditions (including prices) to a considerable extent independently of its competitors. This is a relevant consideration in the analysis of competition, but also for the other public interests. For instance, without market power it is unlikely that firms can lock in customers. The risk of violations of fundamental rights by a platform is also higher if there are insufficient alternatives for consumers.

As explained, digital markets have a tendency to tip into a winner-takes-all outcome because digital business models often aim to internalize network effects. The risk of tipping markets may increase due to other business model characteristics that influence market power: such as economies of scale and scope, the use of data, and horizontal and vertical integration. If a platform is used by other platforms there is a risk that the platform obtains a gate keeper position. However, there can be a number of mitigating factors that constrain the market power of a platform, even when it has a high market share or realizes excessive profit margins [12].

Digital innovations not only aim to contest strong positions in other digital markets. Digital business models also seek to disrupt more mature markets in the physical world: e-commerce platforms disrupt the brick-and-mortar retailers; digital taxi- and car-sharing platforms disrupt taxi markets; booking and home-sharing platforms disrupt the hotel industry; etc. From an economic perspective, such disruptions are generally welcome as they address certain market failures such as market power or information asymmetries. However, while challenging the boundaries of mature markets, digital innovators may also challenge the boundaries of the law. In order to ensure a level playing field, the public interest ‘competition’ should include that ‘rules are applied equally to market players’. For example, the sharing website *Thuisafgehaald.nl* allows users to offer meals to other users and thereby (indirectly) competes with suppliers in the prepared-food market who are subject to taxes and regulation on food safety.

2.4.2 Platform characteristics and 'consumer interests'

Consumer choice is closely related to ‘competition’. If a platform abuses its dominant position, this would be detrimental to consumer interests [31]. Moreover, consumer choice can be restrained if the consumer is locked in and thereby may impede competition. Consumer lock-in may result from network effects in combination with a lack of interoperability or interconnection between platforms. This is especially the case for communication platforms and platforms of platforms.

Consumers often do not have the same information regarding the quality and safety of a platform as the platform itself [32]. Such an information asymmetry can, similar to market power, result in market failure. None of the platform characteristics does in itself result in information asymmetry but consumer protection (in the dimension of security and privacy) becomes more important as more user data is gathered by a platform. As such, the revenue model may also be a relevant characteristic to consider. Especially in the ‘advertising model’ the interests of the users on a platform are not always aligned with the interests of the platform. This can be a justification for government intervention to protect consumer interests, e.g., by imposing transparency obligations.

Digital platforms can also reduce information asymmetries as they bring buyers and sellers together and offer transparency on prices. The quality of a service or product can also become more transparent as many platforms use reviews submitted by users which can reduce information asymmetries.

2.4.3 Platform characteristics and ‘freedom from improper influence’

In order to have any proper or improper influence a platform has to have a certain amount of (market) power. For this reason all of the platform characteristics mentioned in the earlier discussion of competition and innovation are to a certain extent relevant for the public interest ‘freedom from improper influence’ as well. The characteristic ‘use of platform by other platforms’ has a relation with the public interest ‘freedom from improper influence’, as platforms that are used by other platforms can set conditions for access to platforms which may result in improper influence. From another perspective, digital platforms provide a powerful medium to express opinions and to share information. In this way, platforms can also contribute to pluralism and diversity (both in a positive and negative way [33]).

2.4.4 Platform characteristics and ‘Integrity and continuity’

For individual users it is often difficult to obtain information about the integrity and safety of a platform: there is information asymmetry between users and platform owners. The more user data is used by a digital platform, the more important the public interest ‘integrity’ becomes. Continuity is especially important for platforms that enable the functioning of other platforms. For the same reason, continuity risks increase with the level of horizontal integration of a platform.

2.5 Instruments

The third component of the analytical framework covers the government instruments and their application, the rightmost column in Figure 1. Before considering what policy instruments the government may or may not adopt to protect public interests, a number of preliminary considerations need to be taken into account. These include taking account of regulation already in force, whether this regulation is sufficient to protect public interests, and whether national and European regulators are actively enforcing this regulation in digital platform markets (*cf.* [34]). Table 2 sets out these considerations.

Table 2. Generic considerations with respect to the adoption of instruments.

Topic	Considerations
Existing/non-existing instruments	What generic or sector specific regulation/instruments are already in place? Are areas – related to digital platforms – not covered (completeness of the tool box) and should they be covered?
Application and enforcement	Are regulatory frameworks implemented in practice, and are regulators actively enforcing, or attempting to enforce, regulation to digital platforms?
Static/Dynamic	Digital platforms are in transition and require a more normative/functional approach instead of overly detailed regulation common to static markets.
Risk/harm Ex ante/ex post	Policy question on weight to be attached to certain public interests, i.e. higher risk of harm might suggest ex-ante regulation, while lower risk of harm might suggest ex-post regulation; risk/harm approach can be used to assess innovation opportunities.
Subsidiarity	How much space have (or should have) national governments to intervene with generic and sector-specific regulation, taking account of EU regulation?

2.5.1 Existing instruments

First, it seems appropriate to consider the instruments which are already in force, and whether these instruments already provide or can provide sufficient protection for these public interests. Claiming the need for new regulation implies that existing instruments do not work and putting new rules in place means more or less that nothing can be done before new rules have been put into place (a process which can take years).

In this paper, the focus is on EU instruments. The EU's competence extends into many areas of regulation related to digital platforms and several categories of existing instruments can be distinguished which are more specifically related to digital platforms. Some of them are of a more generic nature such as competition law, dealing with abuse of dominant position, anti-competitive agreements and mergers and acquisitions. For example, the Consumer Rights Directive [35] applies to contracts between a trader and a consumer, including contracts concluded on the Internet. The directive includes rules on price transparency, pre-ticked website boxes, withdrawal rights, and refund rights.

Other instruments are more sector specific. The E-commerce directive [36] includes rules on the transparency and information requirements for online service providers, commercial communications, electronic contracts and limitations on the liability of intermediary service providers. The Audiovisual Media Services Directive [37] sets out the rules for broadcasting and also for on-demand audiovisual media services, such as on-line streaming services. The Data Protection Directive [38] sets out obligations for companies that process personal data, including that processing must be legal and fair, data must be collected for legitimate purposes, and individuals can rectify, remove or block incorrect data about themselves. Also, the E-privacy Directive [39] requires that member states ensure websites have a user's consent before placing or accessing certain cookies on a user's device.

We observe that existing instruments are particularly relevant when digital platforms 'meet' the offline world. Health and safety regulation is relevant when platforms facilitate the delivery of food, for example in a shared economy mode. Public safety and housing rules continue to apply to renting apartments.

2.5.2 *Application and enforcement*

A second consideration is whether instruments currently in force are being adequately implemented, and whether regulators are actively enforcing, or attempting to enforce, regulation that may apply to digital platforms. European regulatory frameworks can offer substantial scope for further developing and detailing these frameworks with complementary national implementation. Where rules are unclear, bylaws and guidelines can support and strengthen enforcement.

The main bodies with responsibility for monitoring the operation of digital platforms are (independent) competition authorities, sector-specific regulators, consumer protection authorities, and data protection authorities. These bodies have a vast array of tools available, including competition law, sector-specific laws, consumer protection law, and data protection law, and there are powerful sanctions available. Indeed, the strong potential of national regulators to protect the public interests, and to bring about behavioral change by digital platforms, is readily evident from recent enforcement actions⁶. Notably, proper enforcement inevitably depends upon questions of prioritization, and sufficient resources.

The application and enforcement system is complemented by court decisions. Jurisprudence – although sometimes a lengthy process – can contribute to the interpretation of rules, and to the legitimacy of regulatory activity by the authorities. For example, courts have provided guidance on the applicability of the e-commerce directive and on the relevance of proper protection of privacy.

2.5.3 *Static/dynamic market regulation*

As the analysis of the business models shows, digital platforms are subject to almost constant development and change. This conflicts with a traditional regulatory approach dealing with more static situations. Due to this characteristic a more normative/functional approach is required instead of overly-detailed regulation common to static markets. Therefore, it may be necessary to move towards ‘principles-based regulation’, as opposed to ‘rules-based regulation’. On the one hand, principles-based regulation relies upon substantive standards or objectives imposed on industry stakeholders to achieve legislative purposes. It imposes a general standard for conduct – leaving it to the discretion of regulators to decide if particular conduct should trigger a sanction. On the other hand, rules-based regulation relies upon detailed, prescriptive requirements, specifying in advance what specific actions will be penalized. It specifies the trigger for a sanction and, at times, the specific sanction to be imposed.

2.5.4 *Ex ante and ex post regulation*

A further consideration is the policy question on the weight to be attached to certain public interests, and how this will impact upon the regulatory approach. Depending on this assessment, there might be a choice to be made between ex ante and ex post intervention. If consequences cannot be undone or fully compensated, the need for ex ante regulation might be greater. A similar approach

⁶ See the actions taken by various regulators in the context of the activities of Uber at https://en.wikipedia.org/wiki/Legal_status_of_Uber%27s_service and Airbnb at <http://www.investopedia.com/articles/investing/083115/top-cities-where-airbnb-legal-or-illegal.asp>

could be used to set minimum/maximum requirements (although this might conflict with the need for sufficient flexibility). In the context of digital platforms, assessments about ex ante or ex post interventions could be based on using a risk/harm analysis.

2.5.5 Subsidiarity

Subsidiarity is an important concept in EU regulation and can be looked at from several perspectives. No European intervention, or European intervention with (substantial) space for national implementation, can guarantee sufficient space for national governments to act quickly and to take into account differences between member states. This would potentially benefit dynamic sectors such as digital platforms. However, subsidiarity can represent an obstacle for harmonization, while harmonization might represent the risk of creating an overly static situation.

The subsidiarity question is gaining new momentum as (a) existing European instruments are in the process of being replaced or updated, (b) new instruments are being discussed and (c) others are subject of consultation.

2.6 Instruments and enforcement

Based on the considerations above, a number of policy options arise (Figure 4) that are elaborated below.

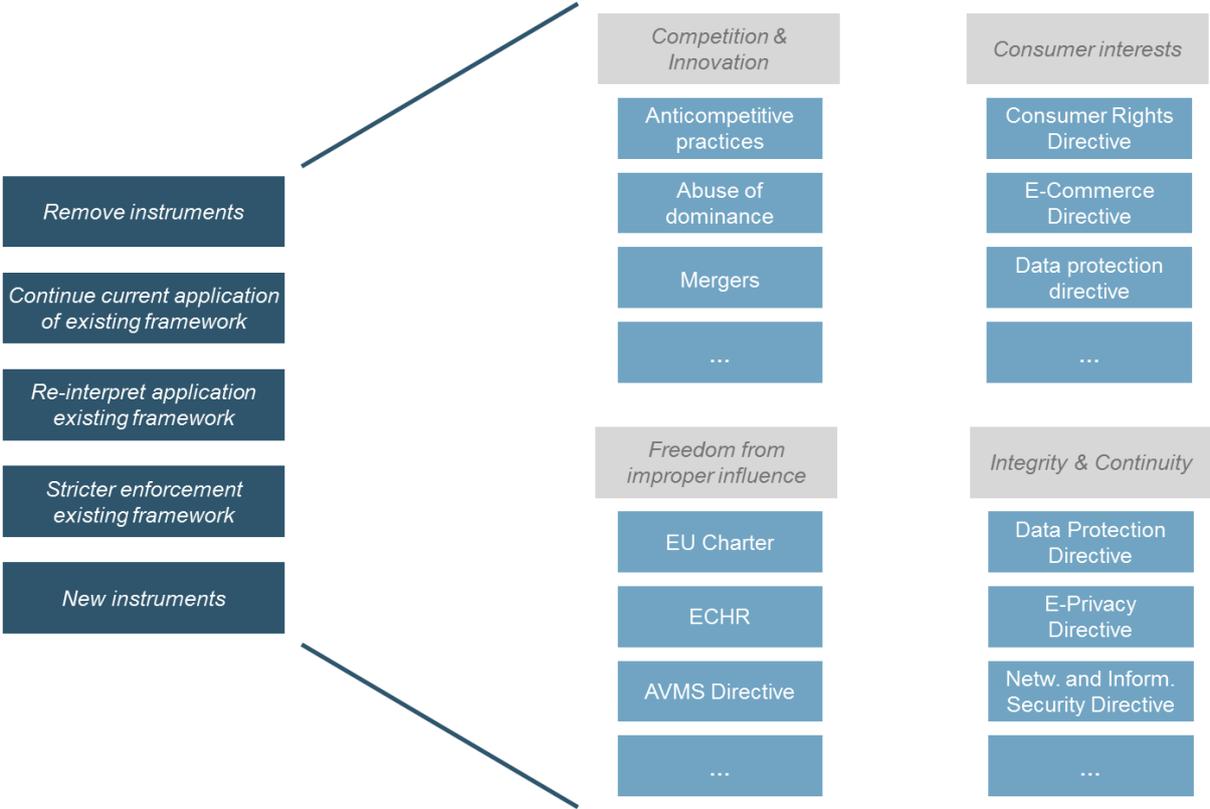


Figure 4. A further breakdown of policy instruments and enforcement.

2.6.1 Remove instruments

A first policy option would be to remove existing regulation. The existence and innovation of digital platforms may remove the need for current regulations, as the original rationale for such regulations may no longer apply. An example would be the continued need for a regulation requiring taxi

metering, when digital platforms offering taxi services decide price and route before journeys. The relevant interest – transparent pricing – is still safeguarded with a more normative/functional approach.

2.6.2 *Continue current application of existing framework*

Given the breadth of current European Union regulation, and further proposed European Union regulation, one can in many cases rely on the application of existing frameworks. Competition law is a clear example in this context, because it offers a flexible approach able to deal with digital platforms.

2.6.3 *Re-interpret application of existing framework*

In many instances, whether a current regulation applies to a digital platform is a matter of interpretation, and it is the competence of courts to decide upon this interpretation. One of the most well-known examples is the *Google Spain* judgment issued by the EU Court of Justice, holding that search engine operators are personal data ‘controllers’, and individuals may, under certain circumstances, request that certain search results be removed based on a search for an individual’s name [40]. In a similar vein, the EU Court of Justice will soon give its interpretation on whether Uber is a transport service or an ‘information society service’ under the Services Directive [41]. Moreover, reinterpretation avoids ‘white spots’ in regulation which would take years to become regulated. Finally, legislatures may also provide new interpretations of existing regulation, taking account of new insights based on market developments or technological innovation. This can contribute to a more granular approach.

2.6.4 *Stricter enforcement of existing framework*

Another option is use the existing framework to a fuller extent by enforcing it stricter in situations where this is called for. Here, we see different approaches and options, depending on the authorities involved.

Targeted enforcement by national authorities: following an evaluation of current regulation and enforcement, it may be that national regulators need to adopt a more targeted enforcement of certain digital platforms.

Targeted enforcement by European authorities: it may be that European authorities are best placed to engage in targeted enforcement in certain digital platform markets (such as cross border). The most relevant example of targeted enforcement would be the European Commission launching an antitrust investigation into the e-commerce sector [42]. It should be noted that applying general EU competition law may result in lengthy procedures with the risk of not matching the urgency of the case.

Cross-border regulatory enforcement: regulators from a number of jurisdictions may be best placed to properly enforce the current regulatory framework. For example, the Dutch Data Protection Authority and the Canadian Office of the Privacy Commissioner launched a collaborative investigation into the communications app WhatsApp, which resulted in behavioral changes, and better protection of data and privacy by WhatsApp [43].

Increased funding for national and European regulators: given the increased activity of digital platforms in certain markets, it may be that national regulators do not have the resources to adequately enforce current regulation. In this regard, increased funding may be the most appropriate response, such as the Irish government doubling the funding made available to the Irish Data Protection Commissioner, given the operations of many large digital platforms in its jurisdiction. Additional funding is not the only relevant aspect. Regulators also need to build the right attitude towards enforcement ('no guts, no glory'). Another obstacle for effective enforcement could include the lack of sufficiently tailor-made procedures, including redress and access to courts.

2.6.5 *New instruments*

A final policy option would be to develop 'new' instruments. This need not be the blunt instrument of legislation, but could include soft instruments such as self-regulation and co-regulation.

Self-regulation would include digital platforms adopting amongst themselves, and for themselves, common guidelines (such as codes of practice or sectoral agreements [44]). Self-regulation needs to be carefully assessed as an instrument because in general it lacks effective enforcement.

Co-regulation would include a framework of overall objectives, basic rights, enforcement and appeal mechanisms, and conditions for monitoring compliance which is set in legislation. Co-regulation combines binding legislative and regulatory action with actions taken by the actors most concerned, drawing on their practical expertise. The result is wider ownership of the policies in question by involving those most affected by implementing rules in their preparation and enforcement. This often achieves better compliance compared to self-regulation, even where the detailed rules are non-binding [45].

For example, YouTube, Vevo, Sony Music UK, Universal Music UK and Warner Music UK agreed with the UK government and the British Board of Film Classification (BBFC) (a statutorily-recognized independent body) to voluntarily introduce a ratings system for online music videos [46]. The use of reputation mechanisms – as self- or co-regulation – is another way to deal with information asymmetries and to optimize the relationship between services and consumers in a digital platform environment.

Four inroads for regulation

On the other hand, it may be considered necessary to adopt or optimize legislation, and a range of instruments is available. Table 3 shows four possible inroads for regulation. The figure models regulation and intervention based on 1) whether regulation is generic or specific and 2) whether it is digital platform related or not. In the bottom left corner generic instruments are positioned which do affect digital platforms but without being specifically aimed at them. General competition and consumer law fall into this category. These instruments have the advantages of being broad and flexible, but need to be further framed in order to be useful. These non-specific general instruments are complemented by a) instruments that are also generic, but sector specific (lower right corner, example here is the Audiovisual Media Services Directive) and b) instruments that have a direct effect on digital platforms but are still of a generic nature (upper left corner: the e-commerce directive falls clearly into this category). Finally, the upper right corner deals with specific digital

platform instruments. At the moment this type of regulation does not exist and the EC has indicated that is also not aiming at introducing such measures [47].

Table 3. Four possible inroads for legislation.

Generic/Specific Digital/Non-Digital	Generic regulation / intervention	Specific regulation / intervention
Digital platform	Generic digital platform (e.g. e-commerce directive)	Specific digital platform (non-existent (yet))
Non-digital platform	Generic, not sector specific (e.g. competition law)	Generic, sector specific (e.g. AVMS directive)

The typology helps to determine what the available options are for intervention. The dynamic character of digital platforms implies that specific regulation for digital platforms has fewer possibilities to deal with quickly changing environments. On the other hand generic, non-sector specific instruments can provide great flexibility, but can only be effective if they are sufficiently framed by lower regulatory instruments or guidelines.

3 Illustration of the framework with forward and return-path analysis

In the previous section, the framework has been introduced with an emphasis on the forward direction: from platform characteristics to public interests and then on to instruments. In this section, we illustrate this path using the Facebook case study as an example. We also illustrate the analysis of the return-path, in which we analyze the impact on the characteristics of the platform, taking into account second order effects as the digital platform itself will respond to an intervention as well. The impact of an intervention on other public interests is also determined, using the adjusted platform characteristics as a starting point. Since the goal of this study is to develop a generic framework and not to provide policy advice for a specific platform cases, we do not consider the use of existing or new instruments for the Facebook case. To illustrate the return-path in the analytical framework, we consider a (fictitious) social network application, different from Facebook, driven by a direct payment (subscription) revenue model. If the framework is applied to a case with the goal to analyze specific issues or questions, a further level of detail would need to be added.

It is important to keep in mind that the framework is not a straightforward decision tree, as will become clear from the example. First, there is the return route that provides a feed-back loop in the analysis. Second, and more importantly, the framework involves a policy or political weighing of different options for the promotion of public interests or the applications of instruments. The framework does not attempt to capture this weighing process.

3.1.1 Summary of Facebook's business and activities

With around 1.7 billion users⁷, Facebook is the world's largest social network today. Facebook has integrated a number of related applications, such as video, messaging and photos in its main social networking app [49]. Facebook has made a number of substantial acquisitions, such as WhatsApp [50] and Oculus [51]. At the time of writing of this paper, the WhatsApp messenger and the Oculus devices are offered separate from Facebook's main social networking applications. Facebook's primary revenue model is advertising: it offers targeted advertising based on the information it has available on its social network user.

3.1.2 Forward path: Facebook's platform characteristics and relation to public interests

The evaluation of Facebook's platform characteristics and their relation to public interests is shown in Figure 5.

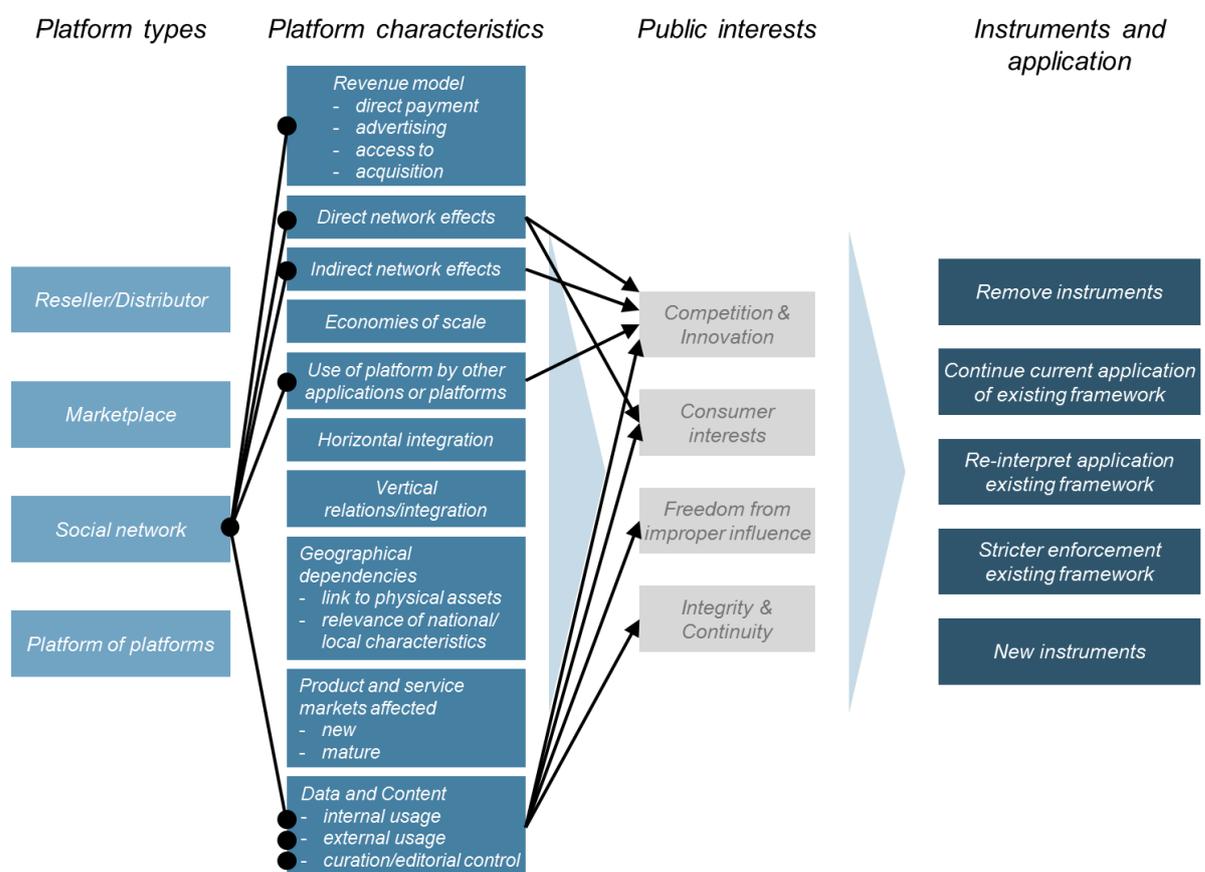


Figure 5. Overview of Facebook platform characteristics and their relation to public interests.

In the coarse typology of platforms, Facebook best matches the Social Network category. As will be seen below, because of some of its characteristics there is also a partial match with the Platform of platforms category. The next step is the evaluation of the platform characteristics:

⁷ Facebook had 1.65 billion monthly active users in March 2016 [48].

- Facebook's dominant **revenue model** is advertising. Advertising accounts for over 96% of Facebook revenues⁸.
- The **direct network effects** of the Facebook platform are strong, as the value of Facebook for its users strongly depends on the number of other users and friends. The direct network effects have an impact on competition and innovation. First, the direct network effects introduce a substantial entry barrier for potential competing social networks. At the same time, the direct network effect brings the value and scale to the Facebook innovations. From the consumer interest perspective, the direct network effect created by a large group of Facebook friends makes it hard to switch from Facebook to another social network. Multi-homing, i.e., using multiple social networks in parallel, is common. This means that the *actual use* that users make of a social network is more important than whether they have an account or not.
- The **indirect network effects** of the Facebook platform are strong as well, as the value of Facebook for advertisers strongly depends on the number of users. The strong indirect network effect makes it difficult for potential competitors to create a targeted advertising offer that matches Facebook's. Also, for large companies and SMEs, Facebook cannot be missed as an interaction channel with their customers. At the same time, the presence of these indirect network effects show that advertisers and companies benefit from Facebook's success in attracting a large group of users.
- Facebook's **economies of scale** are moderate. Its global brand and scale enables Facebook to attract mobile operators in many developing countries to the internet.org project [53].
- The **use of the Facebook platform by other platforms** is moderately strong and has an impact on both competition and innovation. Facebook plays an important role in the distribution of many (casual) games. For the games providers, the Facebook platform is important because of the indirect network effect. Still, they have several alternative options for distribution, such as global app stores with a similar large end user base. Major other applications (e.g., Airbnb) use the Facebook login mechanism, typically as an alternative to their own mechanism. Furthermore, many websites use Facebook's Like button and comment fields. These examples show that many companies use and benefit from the Facebook platform. They therefore depend to some degree on Facebook, but they have a choice in other platforms and distribution channels.
- The Facebook platform shows a moderate degree of **horizontal integration**. The additional products that Facebook offers (such as Messenger, Video and Photos) stay close to the main social networking product.
- Facebook shows substantial **vertical integration** in several areas. It operates an extensive datacenter infrastructure that supports its service. Facebook has moved into devices (earlier Facebook Home Android overlay, acquisition of Oculus).
- Facebook's offering currently has limited **geographical dependencies**, as it provides essentially the same service to its global customer base.
- The **data and content** is used for both internal and external purposes and is also subject to curation and editorial control by Facebook. Facebook uses the (partly personal) data and content provided by its users internally, for example in the news feed of the Facebook service. Facebook's attraction for its users, and also much of its competitive strength, is in its innovative

⁸ Derived from data in Facebook Q1 2016 Earnings [52]

use of data provided by the users themselves in ways that they find useful. This internal use of data occurs in parallel to its external use in targeted advertising. Based on underlying data that stays within Facebook's domain, advertisers can choose their audience by location, age, interests and more. Facebook's use of personal data and content strongly links to users' right to privacy and right to data protection and the integrity and security of (personal) data. Facebook exercises editorial control according to its own community standards [54]. Because of its large user base, Facebook is an important platform for sharing of news and opinions, which links Facebook's editorial control to freedom of expression

3.1.3 *Return path: from a proposed instrument to impact on platform characteristics and public interests*

To illustrate the return path in the analytical framework, we consider a (fictitious) social network application driven by a direct payment (subscription) revenue model. The social networking platform exhibits strong direct network effects. We assume that the data that users provide to the social network is used only within the platform. For the purpose of this example, we analyze the impact of mandatory portability of personal data on the characteristics of this platform, and further on public interests. The mandatory portability of personal data is an instrument contained in the recently adopted European General Data Protection Regulation [55]. Figure 6 shows a compact analysis of the impact of this instrument on the fictitious platform.

- The data portability does not affect the **direct network effect** itself, as it is still attractive to be part of a large social network. Portability does make the direct network effects more vulnerable as groups of users can easier move to another platform. From the consumer interest perspective, a user gets more control over his personal data and the barrier to become an active member on another social network becomes smaller. This is an intended effect of the proposed portability. From the competition and innovation perspective, portability decreases the entry barrier for new, competing social networks. It may shift the mode of competition from 'compete for the market' to 'compete in the market'.
- The portability affects the platform's internal **use of data**. From the competition and innovation perspective, portability may make it less attractive to innovate in internal use of new data as these data need to be portable as well, giving away a potential head start. Innovations also bring a need for updates of export formats which requires work and coordination/standardization between platforms. Platforms may react with 'common denominator' approaches to defend their interests. Portability can also be considered as a new type of external use of the data, not driven by platform owner, but by consumer. As indicated above, this is an intended effect of the proposed portability. At the same time, it will cause data to cross company/platform domains, potentially introducing security vulnerabilities. It can also lead to inconsistencies in datasets that have been used in parallel in multiple social networks.

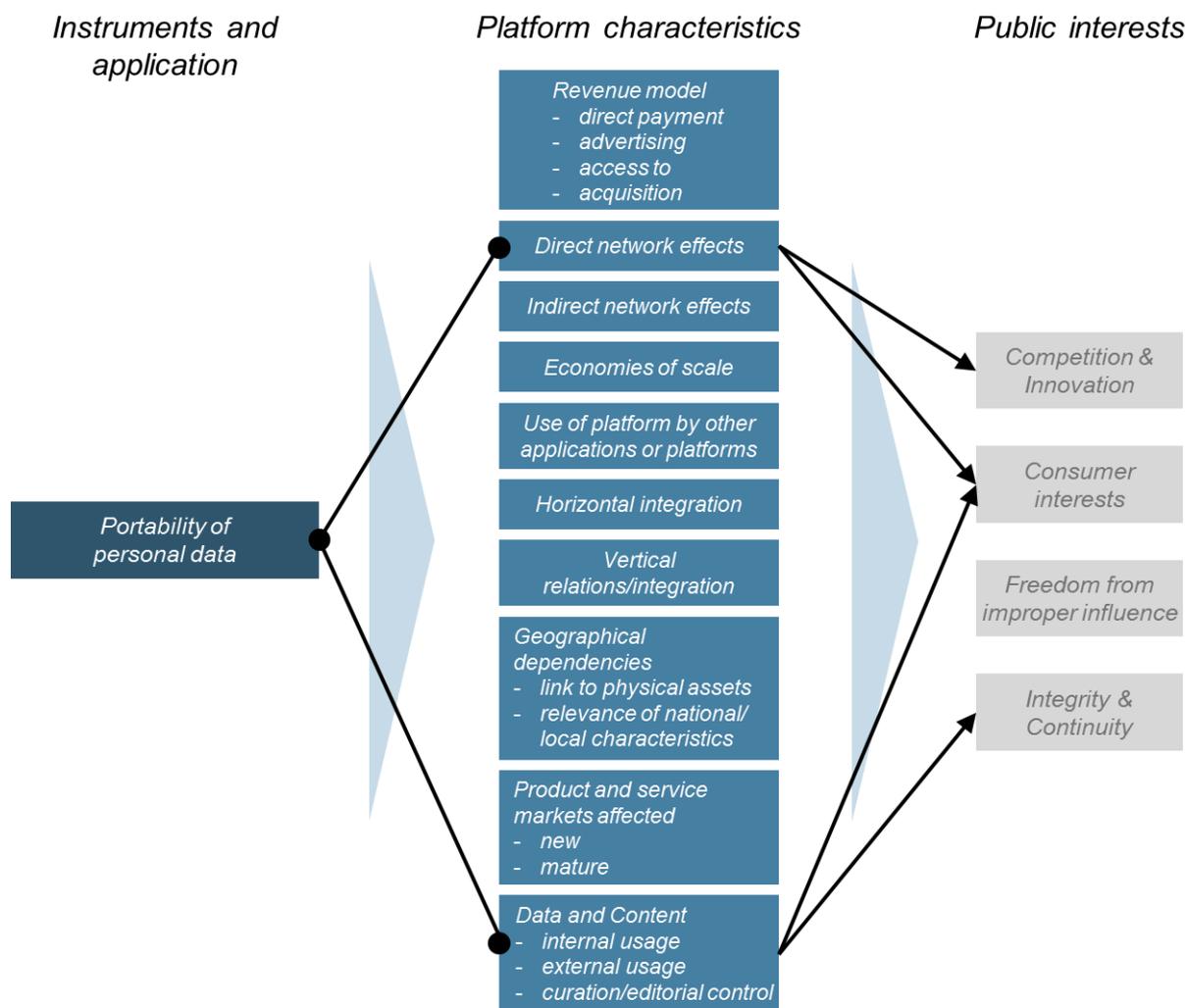


Figure 6. Overview of impact of portability instrument on (fictitious) social networking platform

4 Conclusions

4.1 A structured approach for the analysis of government roles and policies

The framework presented in the previous chapters provides a structured approach that promotes completeness and consistency for the analysis of the government role and policies for digital platforms. The sets of platform characteristics and public interests in the framework can be expected to cover the relevant key points for such an analysis. The platform characteristics are a core starting point for the analysis and – combined with the set of public interests – take the central role, both in the forward direction (from platform characteristics to public interests to instruments) and in the backward direction (from policy interventions to a platform's response, which may affect its characteristics). Through this approach, a consistent overall view is created.

The framework may be shared with stakeholders to provide transparency on policy development and also to obtain their perspectives on platform characteristics, public interests and instruments as input for the analysis. Note that the analytical framework presented in this report is not a straightforward decision tree – for two reasons. First, there is a return route that provides a feedback loop in the analysis (similar to an impact assessment). Second, and highly important, the

framework allows for weighing different policy options. The framework does not attempt to capture this weighing process as such, but does recognize the importance of it and urges policy makers to explicitly include it in the policy analysis.

The development of the framework has been determined by a number of key observations and conclusions on digital platforms that are summarized below.

4.2 Platform characteristics rather than a typology

Each digital platform is different and sometimes acclaimed to be unique; therefore the analysis of the set of platform characteristics is the only relevant starting point for the analysis. This approach is more useful than trying to match specific platforms to a category in a predefined, generic typology of platforms: this is more typical for a bureaucratic approach, ignoring the dynamic aspects of the sector. The analysis at the level of the characteristics clearly does more right to the dynamics and richness of digital platform features than a stable, but necessarily limited, typology.

4.3 Platform characteristics rather than a definition of digital platforms

Most of the characteristics that are of particular relevance in digital platforms are also relevant in cases that do not involve digital platforms, but the dynamics might differ substantially. In fact, our analysis has not identified economic or technical characteristics that are unique to digital platforms. Certain characteristics (such as network effects and use of data) are more pronounced and relevant in many platform cases, but this does not warrant a delineation of digital platforms through a specific definition with the goal to introduce platform-specific regulation. This view is reflected in the EC's recently communicated targeted approach to online platforms ([47],[56]).

4.4 Many existing instruments apply to digital platforms

Many of the characteristics of digital platforms and their potential impact on public interests are known from other contexts. In those contexts, instruments have already been set in place. It is the law makers' and supervisory authorities' challenge to update and interpret the available instruments in order to better promote efficiencies and innovations offered by digital platforms and to better protect public interests. At the same time, there is substantial scope for optimizing the applicability and enforcement of existing instruments, based on a more – often existing – normative perspective. This removes the need to put new instruments in place which is often a lengthy and cumbersome process. However, it requires a substantial commitment to interpret existing instruments and focus on effective normative methodologies for application and enforcement, such as more risk/harm centered approaches.

References

- [1] Kenney, Martin, and John Zysman, "The Rise of the Platform Economy", *Issues in Science and Technology* 32, no. 3 (Spring 2016)
- [2] Public consultation on the regulatory environment for platforms, online intermediaries, data and cloud computing and the collaborative economy, EC consultation, 24 September 2015, available at <https://ec.europa.eu/digital-single-market/en/news/public-consultation-regulatory-environment-platforms-online-intermediaries-data-and-cloud>
- [3] Online Platforms and the Digital Single Market - Opportunities and Challenges for Europe, European Commission, COM(2016) 288/2, 25 May 2016
- [4] Bundeskartellamt, BKartA, B6-113/15, Arbeitspapier – Marktmacht von Plattformen und Netzwerken, Juni 2016
- [5] Monopolkommission, Competition policy: The challenge of digital markets, Special Report No 68, 2015, available from <http://www.monopolkommission.de/index.php/en/reports/special-reports/284-special-report-68>
- [6] French Digital Council, Opinion no. 2014-2 on platform neutrality, Paris, 2014
- [7] Autorité de la concurrence & Bundeskartellamt, Competition Law and Data, May 10, 2016
- [8] House of Lords, Online Platforms and the Digital Single Market, Select Committee on European Union, 10th Report of Session 2015–16, 20 April 2016
- [9] Digital Platforms: an analytical framework for identifying and evaluating policy options, Van Eijk et al, TNO report R11271, October 2015, available from <https://www.rijksoverheid.nl/documenten/rapporten/2015/11/09/digital-platforms-an-analytical-framework-for-identifying-and-evaluating-policy-options> (retrieved June 20, 2016)
- [10] Peitz and Valletti (2014), 'Reassessing competition concerns in electronic communication markets', ZEW Discussion paper 14 (101).
- [11] D. Evans and R. Schmalensee, The Industrial Organization of Markets with Two-Sided Platforms, *CPI Journal, Competition Policy International*, vol. 3, 2007
- [12] Batura, O., P. Larouche, and N. Van Gorp, "Online platforms and the EU digital single market: a response to the call for evidence by the House of Lords' Internal Market sub-committee", *e-Conomics*, 23 November 2015
- [13] Rohlfs, Jeffrey, (1974), A Theory of Interdependent Demand for a Communications Service, *Bell Journal of Economics*, 5, issue 1, p. 16-37, <http://EconPapers.repec.org/RePEc:rje:bellje:v:5:y:1974:i:spring:p:16-37>
- [14] Katz, Michael and Shapiro, Carl, (1985), Network Externalities, Competition, and Compatibility, *American Economic Review*, 75, issue 3, p. 424-40, <http://EconPapers.repec.org/RePEc:aea:aecrev:v:75:y:1985:i:3:p:424-40>
- [15] Farrell, Joseph and Saloner, Garth, Standardization, Compatibility, and Innovation, *Rand Journal of Economics*, Vol 16, No. 1 (Spring, 1985), 70-83

- [16] Rochet, J.-C. and Tirole, J. (2003), Platform Competition In Two-Sided Markets. *Journal of the European Economic Association*, 1: 990–1029. doi: 10.1162/154247603322493212
- [17] Challenges of competition policy in a digitalised economy, European Parliament, authored by N. van Gorp and O. Batura, IP/A/ECON/2014-12 (2015)
- [18] Jens Prüfer and Christoph Schottmüller, “Competing with Big Data”, paper presented at the 20th Annual Conference of the Society for Institutional & Organizational Economics, Paris, June 15–17, 2016
- [19] Case No COMP/M.7217 - Facebook/ Whatsapp, Regulation (EC) No 139/2004 Merger Procedure, L-2985 Luxembourg, 3/10/2014
- [20] Van Gorp, Van Doorn and Canoy (2008), “Leveringsvoorwaarden Internetwinkels”, Ecorys study for the Dutch Competition Authority (NMa), available at <https://www.acm.nl/nl/download/bijlage/?id=7801>
- [21] Alexandre de Stree (2016), “competition in the digital economy”, presentation at the CEPS/e-Economics seminar “Competition policy in the digital economy: towards a new theory of harm”, Brussels, June 1, 2016
- [22] Van Gorp (2016) “Consolidated conclusions from the seminar: Competition policy in the digital economy, towards a new theory of harm”, Brussels, June 1, 2016
- [23] Daniel Knapp (2016) “The logic of data & the structural transformation of media: a practical perspective”, presentation at the CEPS/e-Economics seminar “Competition policy in the digital economy: towards a new theory of harm”, Brussels, June 1, 2016
- [24] Online Platforms, European Commission Staff Working Document, COM(2016) 288, 25 May 2016
- [25] Vision on telecommunications, media and internet: the next steps, Ministry of Economic Affairs, 23 December 2014, available at <https://www.government.nl/documents/reports/2014/02/07/vision-on-telecommunications-media-and-internet-the-next-steps>
- [26] Richard A. Posner, Theories of Economic Regulation, *The Bell Journal of Economics and Management Science*, Vol. 5, No. 2 (Autumn, 1974), pp. 335-358
- [27] Pieter Nooren et al, Regulation in the converged media-internet-telecom value web, TNO Report R11428, October 2014, available from <http://publications.tno.nl/publication/34611843/NhocfJ/TNO-2014-R11482.pdf>
- [28] Arrow, Kenneth (1962), “Economic Welfare and the Allocation of Resources for Invention,” in R. Nelson, ed., *The Rate and Direction of Inventive Activity* (Princeton, NJ: Princeton University Press, 1962), pp. 609–625
- [29] Tirole, J. (1992), *The Theory of Industrial Organization*, Cambridge, Massachusetts/London, England: MIT Press, fifth printing

- [30] Aghion, Philippe, Nick Bloom, Richard Blundell, Rachel Griffith and Peter Howitt. "Competition and Innovation: An Inverted-U Relationship," *Quarterly Journal of Economics*, 2005, 120(2), May, pp. 701-728
- [31] 'Digital Consumers and the Law: Towards a Cohesive European Framework', L. Guibault , N. Helberger , B. van der Sloot , M.B.M. Loos, C. Mak, L. Pessers, *Information Law Series*, nr. 28, Alphen aan den Rijn: Kluwer Law International 2013
- [32] 'Improving privacy protection in the area of behavioural targeting', F.J. Zuiderveen Borgesius, PhD thesis, <http://dare.uva.nl/record/1/434236>
- [33] Regulating the new information intermediaries as gatekeepers of information diversity, N. Helberger , K. Kleinen-von Königslöw, Rob van der Noll, *Info*, 2015-6, p. 50-71
- [34] W. Schulz, N.A.N.M. van Eijk, 'Study on the Future of European Audiovisual Regulation', Final report of HERMES, Hamburg/Amsterdam, October 2015
- [35] Directive 2011/83/EU of the European Parliament and of the Council of 25 October 2011 on consumer rights, amending Council Directive 93/13/EEC and Directive 1999/44/EC of the European Parliament and of the Council and repealing Council Directive 85/577/EEC and Directive 97/7/EC of the European Parliament and of the Council [2011] OJL 304/64
- [36] Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market [2000] OJL 178/1
- [37] Directive 2010/13/EU of the European Parliament and of the Council of 10 March 2010 on the coordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the provision of audiovisual media services [2010] OJL 95/1
- [38] Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data [1995] OJL 281/31
- [39] Directive 2009/136/EC of the European Parliament and of the Council of 25 November 2009 amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services, Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector and Regulation (EC) No 2006/2004 on cooperation between national authorities responsible for the enforcement of consumer protection laws [2009] OJL 337/11
- [40] *Google Spain SL v. Agencia Española de Protección de Datos*, Case C 131/12, EU Court of Justice, 13 May 2014, available from http://curia.europa.eu/juris/document/document_print.jsf?doclang=EN&docid=152065
- [41] El Juzgado Mercantil 3 de Barcelona plantea cuestión prejudicial al Tribunal de la UE en relación al conflicto de UBER, Poder Judicial España, 11 June 2015, available at <http://www.poderjudicial.es/cgpj/es/Poder-Judicial/Tribunales-Superiores-de-Justicia/TSJ-Cataluna/Noticias-Judiciales-TSJ-Cataluna/El-Juzgado-Mercantil-3-de-Barcelona-plantea-cuestion-prejudicial-al-Tribunal-de-la-UE-en-relacion-al-conflicto-de-UBER>

- [42] Antitrust: Commission launches e-commerce sector inquiry, European Commission Press release, Brussels, 6 May 2015, available from http://europa.eu/rapid/press-release_IP-15-4921_en.htm
- [43] Canadian and Dutch data privacy guardians release findings from investigation of popular mobile app, Dutch Data Protection Authority, News message, 28 January 2013, available from <https://cbpweb.nl/en/news/canadian-and-dutch-data-privacy-guardians-release-findings-investigation-popular-mobile-app>
- [44] European Parliament – Council – Commission, Interinstitutional Agreement on better law-making (2003/C 321/01), para 18
- [45] European Commission, European Governance — A White Paper, COM(2001) 428 final, (2001/C 287/01), p. 17
- [46] Action to protect children from viewing age-inappropriate music videos online, Press release Department for Culture, Media & Sport, 18 August 2015, available at <https://www.gov.uk/government/news/action-to-protect-children-from-viewing-age-inappropriate-music-videos-online>
- [47] European Commission, Opening statement by Vice-President Ansip at the European Parliament on the decision adopted on the Digital Single Market package, 25 May 2016, available at https://ec.europa.eu/commission/2014-2019/ansip/announcements/opening-statement-vice-president-ansip-european-parliament-decision-adopted-digital-single-market_en
- [48] Facebook Stats, available from <http://newsroom.fb.com/company-info/> (retrieved June 20, 2016)
- [49] Facebook products, available from <http://newsroom.fb.com/products/> (retrieved June 20, 2016)
- [50] Facebook to Acquire WhatsApp, available from <http://newsroom.fb.com/news/2014/02/Facebook-to-acquire-WhatsApp> (retrieved June 20, 2016)
- [51] Facebook to Acquire Oculus, available from <http://newsroom.fb.com/news/2014/03/Facebook-to-acquire-oculus/> (retrieved June 20, 2016)
- [52] Facebook Reports First Quarter 2016 Results and Announces Proposal for New Class of Stock, available from <http://investor.fb.com> (retrieved June 20, 2016)
- [53] Internet.org by Facebook, available from <http://internet.org> (retrieved June 20, 2016)
- [54] Facebook Community Standards, available from <https://www.facebook.com/communitystandards> (retrieved June 20, 2016)
- [55] Regulation 2016/679 of the European Parliament and of the Council Of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, OJL 119/1
- [56] Commission updates EU audiovisual rules and presents targeted approach to online platforms, European Commission, Press release, Brussels, 25 May 2016, available at http://europa.eu/rapid/press-release_IP-16-1873_en.htm