

Is There a Need for Platform Neutrality Regulation in the EU?*

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Abstract:

Motivated by the policy discussion in the EU whether to impose non-discrimination obligations for dominant online platforms, we analyse whether such regulation is warranted from an economic point of view. Our contribution is threefold. First, across several platform contexts, we identify (i) (paid) prominence of some third parties over others and (ii) the favouring of a platform's integrated services over independent entities as common discriminatory conducts of online platforms. Second, within this scope, we review the economic literature and find that discrimination in the form of paid prominence may often be in the interest of consumers. However, smaller or low-quality content providers are likely to be worse off, which gives rise to concerns regarding dynamic efficiency and long-term variety in those markets. Additional problems may arise if platform operators are vertically integrated with content providers. Third, based on these theoretical insights, we recommend that EU policy makers should not adopt a neutrality regulation for platforms prematurely. Instead, we recommend to impose new proportionate transparency rules for dominant platforms in order to facilitate the identification of actual misconduct and legal enforcement.

Keywords: online platforms, discrimination, prominence, vertical integration, neutrality obligations, data neutrality, regulation, competition policy, internet governance

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1. Introduction

The rapid growth and the economic success of platform business models shape how today internet users can access digital services and content. On the one hand, online platforms now represent main gateways for businesses, services and content providers, as well as advertisers to gain access and exposure to consumers. For example, the European Commission recognizes the central role of online platforms as “key gatekeepers of the internet, intermediating access to information, content and online trading” (European Commission, 2017a, p. 7).

On the other hand, there have been concerns about the market position and the economic power that some online platforms have gained in the internet ecosystem. For example, after an investigation of platforms’ business models and trading practices, the European Commission has announced that particular scrutiny will be given to platform-to-business trading practices and the concern that some platforms may engage in discriminatory behaviour. In particular, an intermediary may engage in discriminatory behaviour by favouring its own products or services or by discriminating between different third-party suppliers and sellers. Whereas such practices can also be found in traditional media markets, e.g., with respect to advertisements for affiliated content and services, the Commission worries that such discriminatory practices could possibly be harmful to downstream competition if exercised by a platform in a gatekeeper position. Thereby, the European Commission emphasized the significance of platforms for small and medium enterprises (SMEs): 82% of SME respondents in a survey conducted by the European Commission rely on search engines to promote products and/or services online, while 42% use online marketplaces to sell their products and services (European Commission, 2017a).

In this context, the European Parliament has recently stressed “the need for net neutrality and fair and non-discriminatory access to online platforms as a prerequisite for innovation and a truly competitive market” in its report on platforms and the digital single market (European Parliament, 2017, Nr.45). Inspired by these developments, we investigate in this article whether a “neutrality regulation” for dominant internet platforms in the EU is indeed likely to spur static and dynamic welfare.

At first, it should be highlighted that a general platform neutrality principle, which would demand online platforms to present all of their content in a non-discriminatory way, is neither possible nor useful (see also Renda 2015). Instead, it is often the inherent purpose of platforms to organize and present the available content or content providers (i.e., one market side) in an *objectively* justifiable manner (i.e., on objective content characteristics such as quality) such that they are most useful to consumers (i.e., the other market side). If the platform has personalized data about its users, this can also result in a personalized presentation of content for each individual user. There is no per se policy concern associated with this practice (Renda 2015). However, this makes it generally very difficult to assess whether a platform engages in non-objectively justifiable discrimination (biased intermediation), which could be a policy concern.

To this end, in Section 2, we discuss and present (possible) non-objective discriminatory practices of platforms in several different contexts, such as operating systems (OSs) and devices, e-commerce and search engines. We demonstrate that "sponsored prominence" is a particular discriminatory conduct that occurs often and across different platforms. Sponsored prominence means that platforms may choose to grant selected content a more prominent presentation on their platform and that this selection is to some degree *independent of the objective characteristics* of the content. In other words, some content may be featured more than other content, just because it paid the platform for this prominence, or because it is the platform's own content. Such discrimination of content is then not necessarily in the best interest of the platform's users and can have significant ramifications for the economic success of the content providers, also because it may interfere with a content provider's "organic prominence" that is based on objective criteria.

In Section 3, we survey the extant economic literature on possible welfare consequences of sponsored prominence in comparison to a "neutral" platform regime, in which only organic prominence is allowed. Based on these insights, our goal is to offer a theoretically founded assessment of such policy interventions on the involved stakeholders and overall welfare. On the one hand, this includes the impact on prices and quality, which ultimately determine consumer surplus. On the other hand, this involves an analysis of producer surplus, i.e., firms' profits, and in this case also the distribution of surplus between the platform and the various third-party firms that operate on the platform. Moreover, we will discuss economic efficiency from a static and a dynamic viewpoint. Whereas the former is concerned with maximizing consumer or total surplus at a given point in time, the latter considers long-term market dynamics and thus the impact on investments and the variety of offerings available. It is widely recognized that innovation and technological progress have been the main drivers of the internet's success and therefore dynamic effects should play an important role in any assessment of potential policy interventions (see, e.g., Bhargava, Evans & Mani, 2016).

By considering both efficiency goals, in Section 4, we wish to shed light on the trade-offs that may stem from a platform neutrality regulation. Moreover, this allows us to assess and discuss the different concerns that have been raised with respect to discriminatory practices. The ultimate goal of this article is to provide a recommendation on whether non-discrimination rules for internet platforms do have virtue and what consequences to expect from their application. Finally, Section 5 concludes and discusses avenues for future work based on the limitations of this study as well as the identified research gaps.

2. Common Discriminatory Practices of Online Platforms

2.1 Definition of online platforms

We focus on platforms that constitute a *two-sided or multi-sided market*. The multi-sided business model is typical for many of the intermediaries in the internet that now represent important access points between consumers and third-party sellers, services and content providers.¹ According to Hagiu & Wright (2015), a multi-sided platform enables two or more sides to *directly interact*, meaning that those sides “retain control over the key terms of the interaction” (p. 163). Moreover, each side must be *affiliated* with the platform in the sense that they undertake platform-specific investments necessary to participate in transactions with other sides.² In turn, this regularly gives rise to *cross-side or indirect network effects*: the value of the platform to one side grows as the number of affiliates on the other side increases (Rochet & Tirole, 2006, Armstrong 2006). As highlighted by Hagiu & Wright (2015, p.164), this definition allows to distinguish platforms from resellers and fully vertically integrated firms, which have sometimes also been classified as platforms (see Gawer and Cusumano, 2008). Moreover, we do not necessarily require cross-side network effects to be reciprocal. For instance, in the case of advertising users may not care about the number of advertisers on the other side, although advertisers clearly value the number of users (see Hagiu & Wright, 2015).

2.2 Case studies

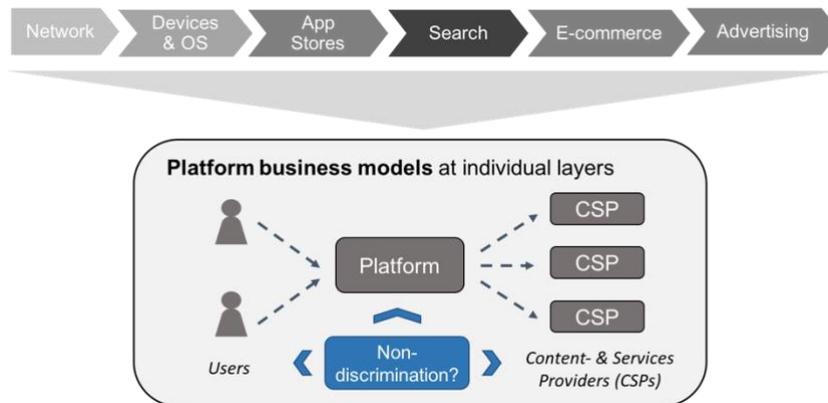
We now provide an overview of several specific concerns about discriminatory conducts by online platforms that have been raised in practice. Those concerns have been raised at different layers of the internet value chain and with respect to various (perceived) gatekeepers. Figure 1 presents a conceptual view of the internet value chain and highlights the myriad of platform business models at different layers, which are surveyed in detail in the following. As indicated by the European Commission’s survey on its proposed platform definition (see Gawer, 2016), the broad and diverse nature of the entities that constitute the internet make it difficult to develop an all-encompassing concept or framework in a top-down manner. Thus, a bottom-up approach that

¹ In the following, we will use the term *content providers*, when we refer to the firms on the side of the platform opposite to users, irrespective of their special occupation. As highlighted in the case studies, those firms may be sellers, app developers, website administrators, service providers or content providers depending on the specific platform considered.

² According to Hagiu & Wright (2015, p.163) such platform-specific investments could be “a fixed access fee (e.g., buying a videogame console), expenditure of resources (e.g., spending time and money on learning how to develop applications using the iPhone’s APIs), or an opportunity cost (e.g., driving to a shopping mall, joining a loyalty program).”

builds upon a collection of specific case studies can provide insight to the question on what the critical issues with respect to non-discrimination are and where such issues arise.

Figure 1: Platform business models along the internet value chain.



2.2.1 End user devices and operating system

On top of the broadband network, end user devices are commonly identified as gateways for users to access internet services and content. As noted by ARCEP (2017), the notion does not only include the hardware link, i.e., the actual device and its technical functions, but also the software link, i.e., the OS. The OS, on the one hand, determines the (limits on) users' ability to install, remove and use applications. On the other hand, through the exposure of application programming interfaces (APIs), the OS determines which functions, at the software and hardware level, can be accessed by third-party device manufacturers and third-party app developers.

In this context, some developers have complained that they cannot obtain access to core functionalities, which they deem necessary to compete with integrated services of the OS provider. For instance, Apple introduced the fingerprint recognition feature *Touch ID* for its services in 2013, but made it available to third-party applications only a year later (AppleInsider, 2014). Similarly, access to the near-field communication (NFC) chip, which is a prerequisite for mobile payment systems, has so far only been granted to *Apple Pay*, but not to competing payment systems (Engadget, 2017). Apple has justified such limitations on security grounds.

Even if developers are able to offer substitutes, they sometimes feel disadvantaged with respect to the placement and the visibility of their apps to users. For instance, apps of the OS provider may come pre-installed with the OS, an issue, which has been at the core of the Microsoft case (European Commission, 2004), or they are displayed more prominently to the user. In other cases, a user may be able to access integrated services of the OS more comfortably than third-party apps. Currently, this is the case for personal voice assistants on smartphones. Whereas *Siri* can be accessed on Apple's *iPhone* with a single click, and *Google Assistant* can be accessed on devices

that rely on Google's *Android* even without touching, third-party apps such as Amazon's *Alexa* need to be started as a regular app, requiring at least two taps (WIRED, 2017).

In summary, the majority of concerns regarding discriminatory practices at the OS layer have been raised about uneven conditions for integrated and third-party apps. In particular, vertically integrated OS operators may gain an advantage because of superior visibility or better integration with OS functionalities.

2.2.2 App stores

In the context of mobile OSs for smartphone handsets and tablets, app stores have frequently been viewed as important gatekeepers between users and application developers. As content has become accessible predominantly in the form of applications on these devices, ARCEP (2017) considers the app store an essential point of access to the internet for users and identifies the editorial policy of the app store operator as a potential limit on end users' ability to access such content.

In some cases, third-party apps have been blocked from being listed in the app store. This may be due to the app store's decision to not allow any apps of a specific category, such as adult content in the case of Apple's *iOS* (Apple, 2016). Moreover, in 2014 Google changed its *Play Store* agreement to prohibit any app whose purpose is to distribute other apps in its *Google Play Store* (Android Authority 2014; Google 2017). This move forced Amazon to remove its alternative *Android Appstore* from the *Google Play Store* (TechCrunch, 2014).

More often, complaints from third-party app developers do not concern outright blocking from an app store, but refer to specific conditions that are prescribed by an app store operator. In the case of the popular audio streaming app *Spotify*, this led to the rejection of an updated version of the app by Apple. At the core of the dispute was Apple's requirement that third-party apps distributed over its app store were only allowed to use Apple's own payment system, for which it charges 30% of any transaction. Moreover, Apple prohibits developers "from redirecting customers inside of an app to purchase digital content or subscriptions outside of the app to avoid paying Apple's standard commission" (Sewell, 2016). *Spotify* has viewed this condition as an unfair advantage for Apple's own music streaming service *Apple Music*, which charges the same subscription fee as *Spotify* for its advertising-free premium service.

Next to being available in an app store, users' access to an app is largely influenced by its general visibility in the app store and its ranking in the result list displayed in response to a user's search queries. In 2015, Google introduced sponsored ads in its *Google Play Store*, which enables developers to promote their apps by bidding for specific key words that match a user's query (Search Engine Land, 2015). The winner of the key word auction is then shown prominently in a prioritized slot on top of the organic search results. In 2016, Apple followed suit and introduced *App Store Search Ads* in the US (The Verge, 2016). In consequence, users can find apps either in

the organic search results list, for which they can modify the ranking criteria to some extent or they rely on the sponsored app result.

Stakeholders have questioned whether sponsored ads, which can be viewed as a form of paid prioritization, may be used to promote inferior content as it possibly enables app developers to bypass competition for quality in the organic search results section. In particular, start-ups and small apps may not have the financing power to gain access to the most prominent spots. On the contrary, it is argued that sponsored ads could support such new ventures by gaining visibility that they could otherwise not achieve against established market participants in organic search (see, e.g., Business Insider, 2016).

2.2.3 Search engines

In this vein, the debate on app store rankings and sponsored ads resembles the arguments made in the context of general web search. In fact, for *Google Search* and most other search providers, sponsored search and the auctions for prominent display slots represent the main financing sources. Because search engines are now often deemed “indispensable for finding relevant content and products from the massive array of options available on the web” (Burguet, Caminal & Ellman, 2015, p. 44), the ranking and display of search results are considered important determinants of content providers’ ability to reach internet users. Next to the concern that sponsored search results may negatively impact competition between third-party content providers by affecting organic search performance (see, e.g., Search Engine Land, 2017 and WordStream, 2017) and thus the choice of users, the (prominent) display of the search engine provider’s integrated content has provoked a range of complaints by third parties.

Following a seven-year investigation, the European Commission decided that Google had abused its dominant position as a search engine by favouring its comparison shopping service *Google Shopping* and discriminating against competing independent shopping comparison services (European Commission, 2017b). The Commission found that Google gave “prominent placement to its own comparison shopping service” and “demoted rival comparison shopping services in its search results” (European Commission, 2017b, p.1). In its decision, the European Commission (2017b, p.4) demanded that Google must take action to “respect the simple principle of equal treatment” with regard to its comparison shopping service, thus, implying that, in this context, Google must treat content and services on top of its web search in a non-discriminatory manner.

With respect to Google’s *Flight Search* service, Edelman & Lai (2016) find that the prominent placement of its flight search results on top of its organic search results increased the “volume of paid clicks by approximately 65% and decreased the volume of organic clicks by approximately 55%” (p. 882). Moreover, they find that enhanced transparency for users by labelling integrated services does not significantly alter users’ click behaviour. Whereas consumers may be indifferent between clicking on organic and sponsored links, this decision obviously impacts the costs of the listed companies to gain prominence and thus access to consumers.

The previously described issues in the context of sponsored search are likely to be augmented if the list of search results that is presented to the user becomes smaller and if users rely on search engines in situations when they are more impatient to obtain a result or recommendation. This is already the case for mobile search services, which are used on the go and where smaller handsets restrict the physical display size. But it is particularly pronounced in the case of personal voice-based assistants. Interacting with personal assistants, users are likely to rely on a single result in response to a voice search query instead of a list with multiple entries to choose from. Furthermore, with voice-based services, it becomes much more challenging to delineate sponsored and organic content.

2.2.4 E-commerce

With respect to internet platforms in general, the European Commission concluded a fact-finding exercise on platform-to-business trading practices by highlighting that among stakeholders there is “widespread concern that some platforms may favour their own products or services, otherwise discriminate between different suppliers and sellers and restrict access to, and the use of, personal and non-personal data, including that which is directly generated by a company’s activities on the platforms” (European Commission, 2017a, p.8). Moreover, businesses felt that at some platforms the delisting of a product or service or the suspension of an account may come without due notice or without any effective possibility to contest the platform’s decision. In particular, the dual role of some platforms as an access provider and a competitor was often seen as problematic.

With respect to e-commerce platforms that act as matchmakers, such as Amazon and eBay, the prominence given to third-party sellers on the platform’s website or app as well as the displayed ranking order in response to users’ search queries are significant determinants of a seller’s success. Thus, both Amazon and eBay offer sellers to place sponsored search ads. Moreover, if there are multiple sellers for the same product, Amazon recommends one of those sellers as the default to users in the so-called *Buy Box* (Amazon, 2017a). The company indicates that it prioritizes sellers that have purchased the company’s delivery and fulfilment service *Fulfillment by Amazon*, although it does not “disclose specific targets for becoming Buy Box eligible” (Amazon 2017b).

Besides e-commerce market places, booking platforms and online travel agencies (OTAs) represent important B2B platforms that facilitate the matching between consumers and businesses. Those price comparison sites facilitate users’ search for a specific product or transaction and usually receive a commission from businesses for directing the user to their offer or for the completion of a transaction. As shown by Ursu (2017), the ranking of offers on such a platform has a significant causal effect on consumers’ click through rates. More precisely, Ursu estimates the economic value that can be attributed to being ranked one position higher, everything else equal, as USD 1.92 for a specific search on the OTA website Expedia.

For the hotel reservation website *Booking.com*, the German competition authority found that commission rates for hotels vary with the ranking position (Bundeskartellamt, 2015). Among other factors, the ranking position could raise standard commission rates varying between 10-15% up to 30-50%. To assess whether such discriminatory pricing is objectively justified is inherently difficult without the knowledge of the employed ranking criteria. But even if the actual algorithms would be public knowledge, resulting prices and ranking decisions may still be difficult to evaluate, if machine learning techniques and probabilistic decision-making are employed (see, e.g., WIRED, 2016), such that results cannot be explained by simple deterministic patterns anymore.

2.2.5 Common discriminatory practices

The above list of surveyed case studies is naturally incomplete, but still allows us to identify common discriminatory practices that can be observed across different layers of the value chain. As platforms regularly act as intermediaries, matchmakers or gateways, the decisions of a platform have a significant impact on stakeholders of both sides and in particular on the transactions between them. Thereby, a particular important decision is how platforms present third-party sellers, services or content to users. Giving *prominence* or *priority* to some of those parties in one way or the other is likely to increase their visibility and accessibility to users and thus to ultimately boost their success. Conversely, parties that are less visible, ranked lower or even blocked often conceive this as a critical impediment to successfully compete with rivals that can be more easily accessed by consumers.

In general, platform operators argue that they have an inherent incentive to prioritize entities that are most valuable to the other side of the market, in order to make their platform attractive and to maximize turnover. Thus, similar to exemptions from net neutrality at the network layer, where reasonable traffic management is allowed, there are likely to be discriminatory practices, such as the blocking of spam and malware, that are objectively justified, because they benefit all stakeholders. In this context, other stakeholders have called for more transparency with respect to the criteria that underlie platforms' editorial and ranking decision. On the contrary, platforms argue that the technical complexity of the employed ranking algorithms makes disclosure difficult and that, especially for search engines, those algorithms represent the core asset and thus need to be kept confidential. Moreover, making the evaluation criteria fully transparent would open the door to manipulation efforts, which ultimately would render it impossible to establish a quality-based ranking.

In addition to the display of content based on objective (quality) criteria and organic search rankings, many platform operators have introduced the possibility to obtain prominence or priority in exchange for a monetary return. Such promotions and sponsored search advertisements are frequently implemented via an auction mechanism that displays the highest bidder in a prominent spot on top of or next to the organic results. Opponents have argued that such paid prominence would favour large and established companies with superior access to

financial resources over new market entrants and SMEs. On the contrary, proponents suggest that newcomers could benefit from such an instrument to attain visibility more quickly.

Across different layers of the value chain, platforms are often not only active as an intermediary, but also offer additional services and content. Most notably, the platform operator may participate on the supply side of the platform, thus competing with independent third parties for the access to consumers. In consequence, those parties are often concerned about the platform's incentive to favour its vertically integrated supplier and worry about the distortion of a level playing field. Those worries are augmented in cases where platform operators successively enter into adjacent markets on top of the platform and stakeholders fear that previously open platforms will become closed and proprietary ecosystems.

It is important to delineate those issues, which stem from a platform's discrimination between either (i) different third-party sellers, content or services providers, that are all active on the same side of the platform or (ii) the platform's integrated subsidiary and an independent third party that relies on access to the platform, from a wider range of concerns regarding the market power of platforms or their role as intermediaries.

3. Survey of the Economic Literature

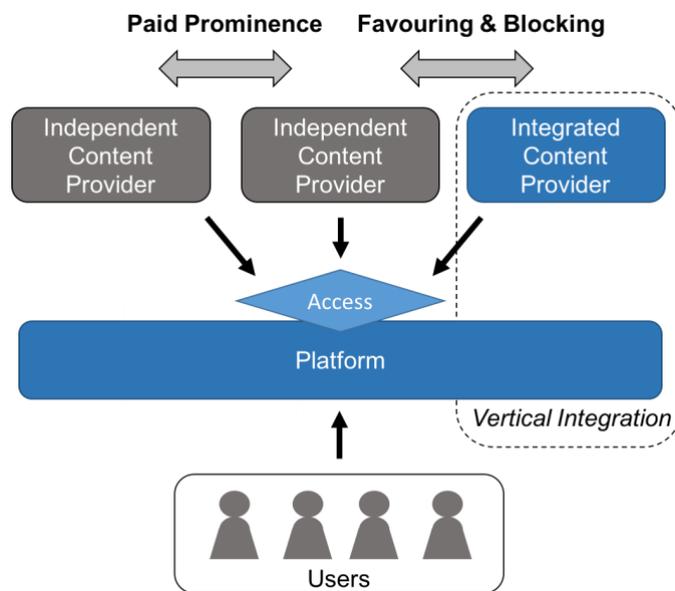
In the following, we survey the economic literature that has explicitly considered a platform's incentives to engage in discriminatory actions with respect to content and service providers and has conducted a welfare analysis. Thereby, we focus on the literature that is applicable to *monopolistic online (software) platforms*, since we are concerned with the application of a neutrality regulation for dominant online platforms that occupy a gatekeeper position. Generally, the extent to which a platform can engage in discriminatory behaviour and biased intermediation depends on the market power of the platform, and can be limited by the fact that the platform needs to attract consumers. Countervailing forces may therefore be the existence of a competing platform, or if the platform is concerned about losing reputation, which may jeopardize consumer demand not only for the platform itself, but also for some of its own other services (cf. Burguet, Caminal & Ellman, 2015). In reverse, this means that the extent to which a platform engages in discrimination and biased intermediation could be considered a measure of market power. Similarly, the extent to which a platform can appropriate the additional profits of content providers stemming from biased intermediation, can be a sign of market power. In any case, it is important to keep in mind that, in the following, it is implicitly assumed that the platform enjoys a considerable degree of market power.

Furthermore, we note that we do not attempt a full review of the economic literature of (monopoly) platforms, but focus our presentation and discussion on the welfare effects of discriminatory actions in the context of "sponsored prominence", which has been identified as a common discriminatory conduct of online platforms in Section 2. In the context of this literature

“sponsored prominence” means that a platform directs those users that tend to follow the platform’s recommendation to the sponsored provider, which in turn increases this provider’s demand. Figure 2 presents our conceptual framework for the literature survey on sponsored prominence. In particular, it highlights that we differentiate between

- i) those settings where the online platform is independent of the providers on its platform³, and
- ii) those settings where it is vertically integrated with at least one provider on its platform.

Figure 2: Conceptual framework for the literature survey on sponsored prominence.



In case i), the platform will sell prominence to the independent providers in return for a listing fee (either set by the platform or determined through an auction). We consider those scenarios in Section 3.1.

In case ii), which we consider in Section 3.2, the platform does not levy a fee, but instead seeks to reap higher profits through its own integrated provider. In this case, we can additionally differentiate between those actions that aim at granting the own provider more prominence (Section 3.2.1), and those actions that aim at excluding rival providers (Section 3.2.2). Of course,

³ In reality, independence of the content provider and the platform may not be a matter of black and white, as the platform may, for example, have a minor share in the ownership of the content. Nevertheless, in the following it will be useful to distinguish between the two extrema, where content providers are either fully independent, or fully vertically integrated. It will be seen that the welfare implications do not differ considerably between these two extremes, and they therefore provide useful benchmarks for all intermediate cases.

because favouring the own content comes at the cost of disfavouring the rival content, the transition between favouring own content and blocking rival content is fluid.

In what follows, we predominantly rely on game theoretic models and analyses to investigate the counterfactual effects of selling or granting prominence. Thereby, we are particularly interested in how prominence generally affects welfare in terms of consumer surplus, producer (or industry) surplus and total welfare. Where available, we also report results from empirical analyses. Robust empirical analyses on this specific topic are scarce, however. First, this is due to the fact that it is necessary to have information on unobservables, like consumers' preferences, content providers' costs or the platforms' ranking algorithm. This information is either typically private and/or proprietary. Second, empirical approaches in this domain usually suffer from numerous endogeneity concerns. For example, due to the missing counterfactual, it is not distinguishable whether a content provider's profits are higher because it was ranked higher, or whether it is ranked higher because it makes higher profits. Some exceptions are Edelman and Lai (2016) and Ursu (2017), who exploit an exogenous change in the presentation of the listing, or the ranking algorithm itself, in order to determine causal effects of rankings on consumer choice. Third, an empirical counterfactual analysis of a regulatory remedy, such as the non-discrimination obligation, would require that there exists variation with respect to the use of that remedy across different platforms or legislative regions. However, in the current absence of such variation, a counterfactual analysis cannot be performed empirically.

The lack of empirical research on the effect of a non-discrimination remedy for platforms should not be used as an argument that it is premature or even impossible to assess its effectiveness from an economic policy perspective. First, as we will highlight below, there exists an already rich body of theoretical literature on the effects of granting prominence in online platforms, which has brought forth some robust insights, on which a policy recommendation can be built. Second, the lack of empirical research, mostly for reasons that the necessary information is not accessible to independent researchers, has also in the past not refrained policy makers from enacting new regulation. For example, also in the context of net neutrality there is until today a void of empirical papers, and yet a non-discrimination policy has been enacted both in the US and in the EU. As laid out in the introduction, numerous regulatory bodies, predominantly in France, have already identified platform non-discrimination as a possible policy arena, and therefore, it is insightful to collect and summarize the available economic insights now in order to inform the stakeholders involved in this debate.

3.1 Selling prominence to independent content providers

The literature on paid prominence can be subdivided into two streams. The first stream can be considered to deal more with an e-commerce context, where a platform intermediates consumers with content providers that offer products or services to consumers for a price. As an example, consider a sponsored search scenario on Amazon or Expedia, where those merchants or hotels that pay the highest ranking fee to the platform are listed on top of the search results and are

thus considered first by the consumers. Here, the providers' price is the main strategic variable, and consequently, this stream of the literature is interested in how paid prominence affects content providers' prices.

By contrast, the second stream of the literature considers platforms that intermediate content providers that offer services for free and derive revenues from the usage of their services (e.g., through advertisements). As an example, consider a classic news website that is listed in the sponsored ranking part of a general search engine and thus considered before other news websites that are listed further below (possibly in the organic search results). Here the content providers' main strategic variable is the quality of the services that they offer. As will be highlighted in the following, sponsored ranking can have very different welfare effects in each of the two environments, and therefore yield very different policy recommendations. Therefore, we will consider each environment separately next.

Moreover, we highlight that the insights from this literature are not limited to a search context in the narrow sense (i.e., to "search engines" of some type), but apply to online platforms more generally. This is because it is the very purpose of online platforms to organize content in order to facilitate the content discovery process of its consumers (Renda, 2015). Thus, platforms need to make some content more prominent than others. One can roughly differentiate between "organic prominence", which is the prominence that a content provider receives independent of any side payments and "paid prominence", i.e., prominence that is (partly) influenced by payments from the content provider to the platform. Most often paid prominence will take the form of a sponsored ranking, wherefore we will use these terms interchangeably.

3.1.1 Impact of paid prominence when content providers compete in prices

The impact of selling prominence (in a platform's ranking) on independent content providers' prices is generally well studied in the economic literature (see, e.g., Arbatskaya (2007), Armstrong, Vickers & Zhou (2009), Zhou (2011), Rhodes (2011), Xu, Chen & Whinston (2010), and Armstrong & Zhou (2011)). This literature builds on three main assumptions that are meant to represent the main characteristics in any online search environment.

Assumption 1: It is assumed that the content providers' offers (e.g., prices or quality of the offer) are not observable to consumers until they have inspected that content providers' website, product or service. This constitutes the need for consumers to search for the content provider that offers her or him the highest utility among the available content providers. Each inspection of a content provider incurs a small cost for consumers (e.g., opportunity costs of time). Although it can be argued that the search costs in the online environment, where each content provider is just "one click away", are significantly smaller than in an offline environment (see, e.g., Copenhagen Economics, 2015), it is not reasonable to assume that such search costs do not exist at all. This is particularly true for mobile browsing, where search costs have been found to be

higher, and thus ranking effects are augmented (Ghose, Goldfarb & Han, 2013). In general, the observation that there exist information intermediaries, such as Google Search, allude to the fact that there do exist non-negligible search costs. This assumption is therefore realistic and reasonable.

Assumption 2: It is assumed prominence alters the order in which consumers search for content. Consumers tend to browse through the search results from top to bottom. Although the specific assumption on the consumers' search order varies slightly between the models, all assume that at least a fraction of the consumers considers the prominent (i.e., top-listed) content provider(s) first. This assumption is consistent with the extant empirical evidence (see Edelman and Lai, 2016; Ursu, 2017) and therefore realistic.

Assumption 3a: With some notable exceptions (to be discussed in Section 3.1.2), in this strand of the literature it is assumed that there are no systematic quality differences between the services or products sold by the content providers. Either the services or products are assumed to be homogenous (identical) and content providers just differ through (ex-ante unknown) prices, or content providers are differentiated horizontally, i.e., with respect to how well they match the idiosyncratic "need" of a given consumer—however, there is no agreement between different users as to which content provider is generally better.

This assumption is clearly unrealistic and extreme, and made mainly for expositional clarity. In fact, in Section 3.1.2 we discuss those papers that have made the other extreme assumption, i.e., where products and services only differ vertically (i.e. in quality), but not horizontally. In reality, both types of differentiation are likely to exist simultaneously; and it will be seen that they have opposing effects on the results. Therefore, it is useful to disentangle the two extremes, and to study each in isolation, before one can draw conclusions on the combined effect, which will be discussed in Section 4.1. The assumption that there are no systematic quality differences between the content providers is therefore still useful in the sense that it assumes a level playing field between the content providers ex-ante. Thus, should there be any systematic differences between content providers (e.g., with respect to profits) due to prominence ex-post, then this can be uniquely attributed to the effect of prominence.

Based on these three main assumptions, the literature has identified the following effects of sponsored rankings:

- a) The (top-listed) prominent content provider earns significantly more gross profits (before deduction of any listing or commission fees) than a non-prominent content provider (Armstrong, Vickers & Zhou 2009; Rhodes, 2011), and generally a content provider's gross profit will fall the less prominent a content provider is listed (Arbatskaya, 2007; Zhou, 2011; Xu, Chen & Whinston, 2010). Therefore, sponsored ranking increases the variance in content providers' profits.

- b) If the platform bases its ranking on the listing fees that it can attain from content providers, then the top-listed content provider will charge the highest price to consumers, and generally, content providers' prices will decrease in the order in which they are listed (Armstrong & Zhou, 2011). All prices tend to be higher than in the absence of a sponsored ranking and consumers' surplus is lower than in the case without sponsored ranking (Zhou, 2011; Armstrong & Zhou, 2011).
- c) Industry profit (content providers' profits plus the platform's profit) increases in the presence of a sponsored ranking. That is, the platform has an incentive to introduce a sponsored ranking, if it is able to expropriate the benefits of prominence from the content providers (Armstrong, Vickers & Zhou, 2009; Armstrong & Zhou, 2011).
- d) If the benefits from becoming prominent on a particular platform are relatively high, then the content providers are likely to compete fiercely for becoming prominent and the platform can expropriate most of the industry surplus. In the extreme, content providers may end up in a *prisoners' dilemma situation*, i.e., the benefits of prominence are more than fully expropriated by the platform, and the content providers may earn less than in a situation in which they are ranked randomly (Arbatskaya, 2007; Armstrong & Zhou, 2011).
- e) Total welfare is likely to be lower in the presence of a sponsored ranking (Zhou, 2011; Armstrong & Zhou, 2011).

The intuition behind these results is as follows: In the absence of systematic quality differences between content providers (Assumption 3a), the platform will base its ranking decision on the commission fees that it attains from the content providers. It will simply select the content provider that bids the highest commission fee. This has two effects on prices. First, the commission fee acts like a marginal "production" cost for the content provider. Consequently, everything else being equal, the content provider that has paid the highest commission fee also has the highest marginal cost, and thus charges the highest price. Second, in the top position consumers' demand is relatively inelastic, because the uninformed consumers are more likely to buy from the content provider at the top. Therefore, even without consideration of commission fees or marginal costs, the content provider in the top position is inclined to charge higher prices to consumers. For the same reasons, prices and profits decrease with a content provider's rank in the search results, because demand becomes more and more elastic, as less and less consumers will eventually consider this content provider.

Consequently, consumers are systematically steered towards the more expensive content providers and thus consumer surplus is reduced in the presence of a sponsored search, where content providers just differ in "prices", but not in "quality". For the same reason, industry profit is increased, as more rent can be expropriated from consumers. This trade-off between consumer surplus and industry surplus becomes more pronounced, the more effective a platform is in steering consumers towards the top-listed content providers. In other words, the more uninformed consumers are in the market, the less elastic is the demand for the top-listed content

provider, the higher its price will be. But at the same time, the top position becomes more valuable to the firms, which intensifies competition for the top position and increases the prisoners' dilemma situation for content providers, so that the platform will be able to appropriate more of the total industry profit. This is consistent with empirical evidence by Blake, Nosko & Tadelis (2015) from a large field experiment with Google Search ads done at eBay. They show, among other things, that content providers may be playing a prisoners' dilemma when advertising their brand.

In summary, this means that in the e-commerce scenario where content providers charge prices for their products or services to consumers, the more valuable the top position in a sponsored ranking is, the more profits the platform will make at the expense of content providers' and consumers' surplus.

3.1.2 Impact of paid prominence when content providers compete in qualities

After having identified the likely detrimental effects of a sponsored ranking regime on welfare when content providers compete in prices (that are not related to significant quality differences) we now describe the likely effects of a sponsored ranking regime when content providers compete in qualities. That is, whereas the reasonable Assumptions 1 and 2 from above continue to apply, this strand of the economic literature considers an alternative third assumption:

Assumption 3b: It is assumed that content providers systematically differ with respect to the quality that they offer. Either it is assumed that content providers systematically differ in their probability that they meet the consumers' needs (e.g., they differ in their relevance towards a specific keyword), or it is assumed that content providers offer products or services of objectively different qualities. In all cases, consumers are homogeneous in the sense that *all* consumers prefer content providers of higher quality or relevance, everything else being equal, and content providers are assumed not to be significantly horizontally differentiated. Sometimes "quality" is considered to be exogenous (e.g., Athey & Ellison, 2011; Chen & He, 2011; Chen & Zhang, 2017), but sometimes content providers can also invest in quality (e.g., de Cornière & Taylor, 2017). Content providers either do not directly charge consumers a price for accessing their services (and are advertising-financed), or they all charge the same prices.⁴ In any case, content providers do not compete in prices.

Based on Assumptions 1, 2 and 3b, the literature has identified the following effects of a sponsored ranking:

- a) Content providers that offer a higher quality, are of higher relevance, or are more efficient in producing quality content, generally make higher profits and therefore have a higher

⁴ In Chen & He (2011), content providers do compete in prices, but in the most relevant case (where consumers believe that the platform ranks content providers according to their qualities), all content providers charge the same price in equilibrium.

incentive to achieve a top position in the sponsored ranking. Consequently, high-quality content providers will be willing to pay more for prominence in a sponsored ranking, and thus, content providers are ranked according to their quality (Armstrong, Vickers & Zhou, 2009, Section 3; Athey & Ellison, 2011; Chen & He, 2011; Chen & Zhang, 2017; de Cornière & Tayler, 2017).

- b) Therefore, the sponsored ranking effectively signals content providers' qualities to the consumers, and it is optimal for consumers to search for content providers in the order of the sponsored ranking. Consequently, taking content providers' quality as given, consumer welfare is higher in the presence than in the absence of a sponsored ranking⁵ (Athey & Ellison, 2011; Chen & He, 2011; Chen & Zhang, 2017; de Cornière & Taylor, 2017).
- c) The top-ranked content provider is likely to have a higher incentive to invest in quality under a sponsored ranking regime; but a low-ranked content provider has a lower incentive to invest in quality under a sponsored ranking regime (de Cornière & Taylor, 2017). Generally, a higher-ranked content provider has a higher incentive to invest in quality than a lower-ranked content provider (de Cornière & Taylor, 2017). Consequently, under a sponsored ranking regime, the variance in content providers' qualities is likely to increase. Taking investments in quality into account, the overall effect of a sponsored ranking regime on consumers' surplus is ambiguous.
- d) Industry profit and (provided that consumer surplus is indeed positive) also total surplus tends to be higher under a sponsored search regime (Chen & He, 2011). However, with a sponsored ranking the platform can expropriate a significant portion of the content providers' surplus, and a sponsored ranking is likely to exacerbate the quality and profit differences between content providers.

The intuition behind these results is as follows: The content providers that offer the highest qualities have the most to gain from being listed higher, and therefore, are willing to bid more to be in the top position. It can then be shown that content providers' (average) bids in the position auction of the sponsored ranking regime are generally monotonically increasing in the provider's quality, resulting in a quality-ordered ranking list. These theoretical results are consistent with empirical observations. For example, Yang & Ghose (2010) find in an empirical analysis of Google search that "firms, which tend to rank highly in organic search [are supposedly of higher quality], are more likely to benefit from sponsored search advertising" (p.618).

As consumers tend to go through the content providers from top to bottom (Assumption 2), and content providers do not differ significantly with respect to prices (Assumption 3a), they encounter the high-quality firms first, which makes their search for relevant and high-quality

⁵ This assumes that, in the absence of a sponsored ranking, consumers would not search the content providers in the exact same (and therefore inferior) order. For example, this may be i) because the platform can only observe the content providers' quality imperfectly and therefore offer a different ranking in its organic search results, ii) because the organic search results are biased in some way (see Section 3.2.1 for incentives to do so), or iii) because consumers would search content providers more randomly in the absence of a sponsored ranking.

content more efficient. This drives up consumers' surplus.

In this context, one may wonder whether a sponsored ranking is the best mechanism through which content providers can signal their quality to consumers. Athey & Ellison (2011), for example, suggest that platforms could additionally reveal "finer information on quality", such as "bids, conversion rates, estimated textual relevance, or aggregates of these" to yet improve the efficiency of consumers search. We will return to these suggestions later in Section 4, when we discuss policy implications.

Moreover, one may also wonder how the sponsored ranking interacts with the simultaneously displayed organic search result. This relationship is, in fact, quite complicated and highly context dependent. Based on the economic literature, four general remarks can be made here: First, assuming an unbiased platform, it depends on how well the platform can observe the quality of the content providers (which is assumed to be private information of the content providers). If there is likely to be error in the measurement of the quality, then the sponsored ranking can indeed be a more effective tool to reveal a content provider's quality. Second, White (2013) shows that a platform may also have an incentive to reduce the quality of the organic search results in order to boost revenues from the sponsored ranking results. Put simply, if the organic search results are too good, i.e., they already rank the content providers according to their quality, then exactly those content providers that would have submitted the highest bids for the sponsored ranking, now have less incentives to do so. Third, it should not be overlooked that also the organic search results are to some extent a "sponsored ranking", because content providers can invest in search engine optimization (SEO) to boost their ranking in the organic search results.⁶ In reverse, often the sponsored ranking also includes a "quality factor" (Google, n.d.), so that content providers are not solely ranked according to their bids, but according to their bid times the quality factor. Indeed, Yang & Ghose (2010) show empirically that SEO and SEM (search engine marketing, i.e., bidding to be placed in the sponsored ranking) are complementary to each other: prominence in the organic listings is associated with a higher probability of click-throughs on sponsored listings, and vice versa. Fourth, in a context where Assumption 3b holds, i.e., where content providers compete rather in qualities than in prices, and where the search engine can observe the content providers' quality with some confidence and is unbiased in its intermediation, it is likely that the sponsored search results and the organic search results are highly correlated.

Finally, it is interesting to observe that a sponsored ranking regime can be shown to immediately influence content providers' incentives to invest in quality. Note that this result does not depend on the use of a "quality factor" in the sponsored ranking as mentioned above, although the use of a quality factor may additionally boost the content providers' quality investment incentives (Katona and Zhu, 2017). Instead, de Cornière & Taylor (2017) highlight that content provider's

⁶ In general, one can differentiate between "black hat SEO" and "white hat SEO" techniques. Whereas the latter is associated with investments in the content directly (which also benefits consumers and thus is generally welfare enhancing), the former is associated with investments into features that are intended to manipulate the ranking algorithm without providing additional user benefits.

investment incentives are governed by a scale effect and by a competition effect. The *competition effect* exerts a negative influence on content providers' qualities. This is because, given a specific ranking order, the sponsored ranking diverts consumer demand towards the top ranked content provider (by Assumptions 1 and 2, and irrespective of the quality of the content providers) and thus, there are fewer consumers for which the content providers actually compete. This drives down the incentives to invest in quality, when quality is the main strategic variable on which content providers compete. The *scale effect*, however, acts in opposite directions for a high-ranked vs. a low-ranked content provider. A top position in the ranking secures a content provider more consumer demand, and thus, due to economies of scale, an investment in content quality becomes more efficient. Consequently, by virtue of the scale effect, the top-ranked content providers have a higher incentive to invest in quality. The reverse effect is true for low-ranked content providers. Due to the sponsored ranking, they receive less demand than before, and consequently, they experience less economies of scale for their quality investments, lowering their incentive to invest in quality.

The caveat of this result is that a sponsored ranking is likely to increase the quality spread between content providers (see effect c) above), i.e., it favours those content providers that already have a stronger market position and reduces the demand, quality and profits of those content providers that are already lagging behind. In summary, while a sponsored ranking may be welfare increasing (with respect to consumers' and industry surplus) in the short run, this effect in the variance of content providers' may be seen problematic from a long run perspective (see Section 4 for a more detailed discussion).

3.2 Granting prominence to integrated content providers

3.2.1 Favouring own services

Whereas in the previous section we have considered the impact of a sponsored ranking where independent content providers pay the platform to be made more prominent, we now consider cases where a content provider does not pay to be made more prominent. The most natural way to think of this is when the content provider is vertically integrated with the platform. In other words, the platform can always fully expropriate the gross surplus of the prominent content provider and does not need to, as in the case of a sponsored ranking, rely on an imperfect rent extraction mechanism like an auction. Thus, as it was shown that the prominent content provider makes more profit than a non-prominent content provider, and since the platform can now fully expropriate the benefits of prominence from its vertically integrated content provider, we expect that under vertical integration the platform has an additional incentive to make its own integrated content provider prominent (see also Hagiu & Jullien, 2011).

However, we have also seen in the previous section that the platform was usually already able to extract a significant portion of the content providers' surplus in case of independent content

providers. Thus, it should also not come as a surprise that *the general insights of the previous section continue to hold under vertical integration* (see de Cornière & Taylor, 2017).

An additional facet of vertical integration between a platform and a small subset of the content providers has been studied by de Cornière & Taylor (2014) as well as Burguet, Caminal & Ellman (2015). Both models consider how vertical integration by the platform interacts with the incentives to discriminate search results in favour of the platform's own content provider(s), when content providers are financed through advertisements, and the platform is financed through a sponsored ranking.

Burguet, Caminal & Ellmann (2015) assume that sponsored search is used mostly by content providers that compete in prices (merchants), whereas typical publishers (e.g., news websites) appear predominantly in the organic search results. However, the same merchants that buy prominence in the platform's sponsored ranking in order to advertise, also buy prominence (advertisements) on the publishers' websites. Under these assumptions, the platform may have an incentive to discriminate the organic search results in favour of less efficient publishers (with lower ad targeting rates) in order to be able to promote its sponsored ranking as a more effective advertising tool for merchants. In this way, it can steal business from the (efficient) publishers. However, if the platform is vertically integrated with a subset of the publishers, then, everything else being equal, it has a *lower* incentive to bias the organic search results in favour of less efficient publishers, because it can internalize more of the publishers' business. This tends to be welfare increasing. At the same time, it now has an additional incentive to bias the organic search results in favour of its own publisher. This tends to lower welfare. The overall effect is thus ambiguous. Yet, even if the overall static welfare effect should be positive, Burguet, Caminal & Ellmann have concerns regarding dynamic efficiency, because the platform can "divert traffic from [independent] non-affiliates to turn the [own] publisher into a market leader" (p.45). De Cornière & Taylor (2014) come to a similar conclusion in a slightly different market environment. Again, the overall static welfare results are found to be ambiguous.

In an empirical paper, Edelman and Lai (2016) quantify the effect of clicks on organic and paid search results when Google introduced its own integrated flight search service and placed it in a prominent position above the organic and below the sponsored search results. They estimate that after the introduction of the prominent flight search service, clicks on paid listings (that relate to revenues from sponsored ranking) went up by about 65%, whereas clicks on organic listing were reduced by about 55%. They attribute this to the fact that after the introduction of the platform's own service, the consumers perceived the sponsored search results as more relevant than Google's flight search service and the organic search results and therefore moved their clicks accordingly. This would be consistent with the above theory, whereby vertical integration leads to a (perceived) bias in organic search results, which renders those results less relevant for users.

3.2.2 Blocking of rival content providers

Finally, one may wonder under which circumstances a vertically integrated platform has an incentive to block a rival content provider from accessing its platform altogether. Although, as discussed above, there have been several accusations of this kind, the economic incentives to actually do so are more nuanced. Here, some models developed in the context of the net neutrality debate (Dewenter & Rösch, 2016; Broos & Gautier, 2017) are informative, because the same concerns have been raised that vertically integrated internet service providers would have an incentive to block rival messaging or telephone services (e.g., WhatsApp).

The trade-off whether to exclude a rival content provider or not can generally be framed in the context of a competition vs. a complementarity effect (see, e.g., Broos & Gautier, 2017). The *competition effect* is what typically comes to mind first in this context. By excluding the rival content provider, the platform can evade the competition and direct more consumers to its integrated service. However, consumers view the offer of the rival content provider generally as a complement to the platform itself. This is particularly apparent in the context of a two-sided market with indirect network effects, where consumers value the presence of (differentiated) content providers on the other side of the market (as in Dewenter & Rösch, 2016). Thus, the presence of the rival content provider generally increases the attractiveness of the platform to consumers, which the platform in turn can monetize in one way or another. This is the *complementarity effect*.

Consequently, when rival content is actually of significantly higher quality than the integrated content (see Broos & Gautier, 2017), or when the rival content is sufficiently horizontally differentiated to the integrated content (see Dewenter & Rösch, 2016), then the complementarity effect dominates the competition effect and the platform does not have an incentive to exclude the rival content. However, if the rival content is not sufficiently (horizontally or vertically) differentiated from the platform's own content, then blocking may be an option. Evidently, when the rival content is of much lower quality, then it is not an actual competitive threat to the integrated content and therefore (e.g., due to reputation effects or the threat of litigation) there is little need and incentive to deny it access to the platform.

In the light of our previous insights, it is worth noting one more concern in this context. Especially in the case when rival content is of similar quality, then, instead of blocking, it may suffice to make the own content more prominent, which, as both contents are of similar quality, can be arguably done so without raising much scrutiny. As shown in Section 3.1.2., this however may then lead to a stronger asymmetry between content providers in the long run, because higher prominence gives the integrated content provider stronger incentives to invest in quality, so that the own content eventually becomes significantly better indeed (compare also to Burguet, Caminal & Ellmann, 2015). Again, this may particularly raise concerns with respect to dynamic efficiency.

4. Policy Discussion and Recommendations

Both ex-post competition law enforcement as well as any ex-ante regulatory intervention should be founded on an explicit theory of harm. That is, a clear understanding on how the considered conduct can potentially prevent, restrict or distort competition, and thus be detrimental to consumer surplus or total welfare. Therefore, a theory of harm needs to specify who actually suffers from a considered conduct and whether those negative effects outweigh any countervailing positive effects. Whether a theory of harm constitutes an abuse that warrants antitrust or regulatory intervention also includes a policy decision on what should be the primary goal⁷ and who should be protected against harmful actions (see, e.g., Farrel & Katz, 2006, for a discussion of the relevant welfare standard in antitrust).

4.1 Welfare Impact of Neutrality Regulation

In the context of online platforms' practices to discriminate between content providers with respect to the prominence that those content providers are granted on the platform, three main concerns (i.e., potential theories of harm) can be raised. First and foremost, concerns can be raised about the possible distortion of a level playing field for competing content providers, putting those content providers at an advantage that are placed more prominently. Second, there is a concern that this discrimination on the content provider side may leave consumers of the platform worse off, because it factually limits their choice set (less prominent content providers are simply not considered) and because consumers may be directed to rather high-priced or less-fitting offers. Third, there is a concern that content quality and content variety in platform markets will deteriorate over time, because providers that do not receive priority may be disadvantaged and thus exit the market in the long run, especially if they compete with vertically integrated content providers of the platform.

As described in Section 3, the economic literature provides a more nuanced picture as to whether these concerns are substantiated or not; and whether a non-discrimination obligation that would prevent online platforms from granting specific content providers prominence can be justified from an economic point of view. Table 1 offers a summary of those insights, which we briefly discuss in the following.

Depending on whether content providers compete rather in prices or in qualities, the economic literature has identified quite different welfare effects of a sponsored ranking regime, provided that the platform is not integrated with one of the content providers. In case content providers compete in prices, the effects on consumer surplus and total surplus are likely to be negative, whereas if content providers compete in qualities, the welfare effects are likely to be positive.

⁷ For example, protection of consumers, or protection of competition between content providers. As detailed in Section 3, both goals can be in conflict from a static welfare perspective.

Table 1: Welfare effects of granting prominence.

Welfare effects of granting prominence to ...	CPs compete in “quality”	CPs compete in “price”
... independent CPs	<p><i>Static Efficiency:</i> Welfare effects likely to be positive, both for consumers’ and total surplus.</p> <p><i>Dynamic Efficiency:</i> Paid prominence regime likely to stimulate investments in quality. However, quality spread between CPs likely to increase. Concern of less CP competition and variety in the long run.</p>	<p><i>Static Efficiency:</i> Welfare effects likely to be negative, both for consumers’ and total surplus.</p> <p><i>Dynamic Efficiency:</i> Paid prominence regime likely to yield prisoners’ dilemma for CPs, as benefits from prominence are increasingly expropriated by platform.</p>
... vertically integrated CPs	<p><i>Static Efficiency:</i> Welfare effects likely to be positive, both for consumers’ and total surplus. However, platform can have an incentive to bias intermediation towards its own CP if a rival CP with similar content and quality exists.</p> <p><i>Dynamic Efficiency:</i> Granting prominence likely to stimulate investment in quality of integrated CP; however, it may discourage rival CPs to invest in quality. Concern of less CP competition and variety in the long run.</p>	<p><i>Static Efficiency:</i> Welfare effects likely to be negative, both for consumers’ and total surplus. Vertical integration allows platform appropriate benefits from prominence perfectly.</p> <p><i>Dynamic Efficiency:</i> Granting prominence may create strategic interaction between paid-for and organic CP placement on platform. Under vertical integration, platform has less incentive to favour high-price CPs, but more incentive to favour integrated CP in organic placement. Overall, the welfare effect is ambiguous.</p>

In reality, content providers will compete in qualities and prices, and thus it is natural to ask, what will happen in such a situation. On the one hand, it is evident, that the results will then be a mix of the aforementioned, and therefore, the welfare outcomes are generally ambiguous. However, de Cornière & Taylor (2017) argue that “under fairly mild conditions” (p.35) the outcomes resemble rather those under quality competition, i.e., the top-listed firm offers the highest utility to consumers (utility being the difference between quality and price). Therefore, in the realistic case where content providers compete in prices and quality, a sponsored ranking is nevertheless likely to be welfare improving, both for consumers as well as for total surplus.

De Cornière & Taylor (2017) also make the point that whether content providers compete in prices or qualities is so decisive for the welfare outcomes, because in the former case, the payoffs between the consumers and the content providers are *conflicting*, whereas in the latter case they are *congruent*. In other words, when a sponsored ranking enables content providers to raise their price, then this is generally good for the content provider, but bad for consumers. Payoffs are thus

in conflict. In reverse, when a sponsored ranking allows high-quality providers to make higher profits, then providers have an incentive to raise their quality, which is good for the content providers and the consumers. The payoffs are congruent. This distinction between congruent and conflicting payoffs may therefore prove to be very useful for the discussion whether a policy intervention is warranted or not.

Across all modes of competition, i.e., whether content providers compete in prices or qualities, or whether payoffs are congruent or conflicting, the economic literature has shown that a sponsored ranking regime tends to amplify any pre-existing differences between the content providers. The gross profits of the prominent (top-ranked) content providers are generally higher than in the absence of a sponsored ranking. However, at the same time, both the theoretical as well as the empirical literature have highlighted that the platform may be able to expropriate a significant part of the content providers' gross surplus through a sponsored ranking. Generally, the more it pays to be prominent, the more likely the platform is able to expropriate the content providers' surplus, and thus the more likely that it is ultimately the platform that gains the most. In reverse, content providers may end up playing a prisoners' dilemma, where no one can commit not to bid for a top position in the sponsored ranking, but ultimately, all content providers are worse off by doing so.

Vertical integration can, but does not need to, lead to own content bias. Especially if rival content is of much higher or much lower quality, then it is not likely that the platform will engage in search distortion or blocking. However, when rival content is of similar quality, and thus competition between the own integrated content and the rival content is particularly strong, then there may be additional incentives for the platform to favour its own content provider by making it more prominent (e.g., ranking it higher). This may then in turn induce a downward spiral, where the higher-ranked own content becomes better and better, and the lower-ranked content becomes worse and worse; a process that raises dynamic efficiency concerns. From a static perspective, however, the welfare effects of platforms' favouring own content is ambiguous. Moreover, one should not forget that even in the presence of a bias, consumer search efficiency can still be higher with the platform than without it (Chen & Zhang, 2017).

In summary, there is no clear-cut evidence that giving prominence to the platform's own services will ultimately hurt consumers or decrease social welfare. The static welfare effects that have been identified previously in the context of selling prominence to independent content providers, generally also apply in the context of granting prominence to vertically integrated content providers. However, with vertically integrated content providers the negative effects in the case of conflicting payoffs may be magnified due to additional strategic considerations. In particular, concerns about foreclosure appear to be most warranted if the integrated content provider and its rivals are similar in quality. Still, from a static welfare perspective, the prioritization of integrated content can likely be justified ex-post, because it incentivizes the integrated provider to undertake higher investments.

In any case, prominence is likely to amplify the difference (in profits and/or quality) between prominent and non-prominent firms. Moreover, it should be highlighted once more that these results are derived from a rather short-term (static) perspective, and do not consider the impact on competitive dynamics in the long run, such as market entry and exit of content providers.

Against this backdrop, we can now turn to the original policy question on whether platform neutrality regulation, i.e., an ex-ante non-discrimination rule, is warranted.

From the static perspective, the welfare implications of a neutrality obligation can be differentiated along the type of competitive environment (as proposed by De Cornière & Taylor, 2017). In a competitive environment where content providers compete in prices (i.e., firms' and consumers' payoffs are conflicting), a *neutrality obligation* (e.g., where content providers are ranked randomly) can indeed increase consumer welfare. However, the same rule is harmful when content providers compete in quality (payoffs are congruent). This is because in the latter case, the platform would be forced to rank quality-inferior firms in the top position, although, under a sponsored ranking, this would not happen. In other words, discrimination in this case does not induce any harm on consumers in the short-run. In contrast, in the former case with conflicting payoffs, a neutrality obligation could protect consumers from harm through higher prices and content providers from a possible prisoners' dilemma situation under a sponsored ranking. Thus, in this specific case, neutrality regulation could improve consumer welfare as well as total welfare. However, in the realistic case when content providers compete in prices *and* quality, welfare effects of a sponsored ranking are ambiguous, but the literature indicates that market outcomes would rather resemble the congruent payoff scenario. In consequence, there would be no objective harm from a static perspective and a non-discrimination rule would rather be detrimental to consumers and total welfare. Thus, generally, the effect of neutrality regulation on (short term) welfare is ambiguous and potentially harmful.

Whereas the economic literature focusses on maximization of the available total surplus, some findings point to issues that could harm competition and thus consumer surplus in the long run. In other words, it is not only the sum of surplus that matters, but also the distribution of surplus and the long-term effects on competitors and market entry and exit. As prominence magnifies the differences between content providers (i.e., high-ranked providers make higher profits and improve their quality, whereas the reverse is true for low-ranked providers) the number of independent content providers in platform markets is expected to continuously decrease. In turn, this may then raise concerns about (the lack of) competition in those markets. Neutrality regulation could then be used to reduce the variance in content providers' prices and qualities, and profits. In other words, content providers would become more similar again. This may not be optimal from a static point of view, but may be seen as beneficial from a dynamic perspective, because it could maintain competition in the long run and prevent market foreclosure or exit.

Along these lines, a non-discrimination rule seems more appropriate from a dynamic perspective, but currently there is a lack of economic research to thoroughly support this claim. Above and

beyond our discussion above, it is worthwhile, in this context, to note that discriminatory practices that weaken specific content providers or even lead to their foreclosure may be perceived as especially “unfair”, if those firms have previously contributed to the success of a platform, e.g., by providing complementary goods or by enabling the platform to grow its user base. This may, for instance, be the case if previously open APIs are not made publicly available anymore, or if the access to a platform is becoming subject to more stringent terms and conditions for a particular set of firms (see, e.g., ProgrammableWeb, 2016). In particular, the market entry and the prioritization of vertically integrated content providers raises concerns about competitive dynamics beyond a particular platform market and about the long-term evolution of competition along the internet value chain.

4.2 Transparency before Neutrality

Since the economic insights do not support a general theory of harm with respect to the considered discriminatory practices that would warrant a wide ex-ante application of a non-discrimination rule, it does not seem wise to apply it prematurely in the EU. Instead, the European Commission may consider to tackle possible unjustified discrimination first by disclosing a platform’s bias through *voluntary or obligatory transparency rules*.

Indeed, in its Mid-Term Review this has also been recognized by the European Commission, who not only identified the “lack of transparency, e.g., in ranking or search results,” as a key issue in this context (European Commission, 2017a, p.8), but also, suggested that additional dispute resolution mechanisms and transparency measures could be conducive to establish a “fair and innovation-friendly platform economy” (European Commission, 2017a, p.8).

Transparency rules present a less severe and certainly in many cases less harmful policy instrument. Specifically, a transparency obligation could only have two (harmless) outcomes: On the one hand, transparency could reveal that there is no bias, either because there never was a bias or because transparency in itself was already an effective means to induce the platform not to engage in biased intermediation any further. On the other hand, transparency may reveal a (non-objective) bias, in which case neutrality regulation could be applied with more confidence.

At this point some comments on the implementation of such a transparency rule seem in order. At first, it needs to be clarified who should be the addressee of the information that is made available through these transparency measures. In general, three addressees are feasible in the context of online platforms: (i) public authorities, (ii) third-party business partners, (iii) consumers. In the following, we suggest that, in a first step, it should suffice to provide additional information to public authorities only, which would allow to keep that information confidential, but yet would be available for legal enforcement.

As this new obligation may be costly for the regulated platforms (in terms of information to be given) as well as for the enforcement agencies (in terms of information to be processed), it is of

the utmost importance that the objective and the scope of this obligation would be strictly circumscribed in accordance with the principle of proportionality. In the following, we make several suggestions how such an ex-ante transparency measure could be implemented in practice.

First, in order to limit the transaction costs of regulation and to avoid additional burdens for new entrepreneurial activity, a clear threshold on the applicability of additional transparency obligations should be defined. Due to the challenges in quickly assessing market power in digital markets in a narrow legal sense (see, e.g. Krämer & Wohlfarth, 2018), a simple screening threshold should be applied. In particular, a threshold that is based on revenues, or alternatively, a threshold that is based on the number of active customers, could be considered as a fruitful starting point for a further discussion.

Second, the information to be given should be determined on the basis of the possible competitive problems identified in the literature and confirmed by the practice as explained in the sections above. Specifically, information on how the sponsored ranking results are determined (e.g., bids submitted by the content providers, the platforms' quality assessment of the content providers, click-through-rates, etc.) could be collected. As this data collection should be limited to a few online intermediaries (see above), it is feasible to clarify the precise nature of data to be shared in a dialogue between the public agency and the respective stakeholders.

Third, data collection should be done on a continuous basis, as long as the threshold criteria (see above) are met. This could establish an empirical basis for quicker and better assessment and possibly enforcement of competition issues, by having both historic and up-to-date information readily available. Similarly, competition authorities in the European Union can rely on market information collected by regulatory agencies, which arguably accelerates competition law cases and also makes potential abuses more transparent due to available data sources. It should be highlighted, however, that this does not necessarily imply that the collected data actually needs to be monitored and evaluated on a continuous basis. That is, competition authorities would still rely on a formal complaint to review this data more closely and would not act upon this information ex officio. Yet, the simple fact that such information is collected and readily available could act as a "coercive regulatory device", which may prevent unjustified discriminatory actions in the first place and render more heavy-handed intervention unnecessary. Overall, continuous data collection is therefore considered to be a promising policy instrument to foster effective competition between content providers in the long run, i.e., to safeguard dynamic efficiency.

Fourth, it yet remains to be discussed which public authority should be responsible for such data collection. Generally, national regulatory authorities already have expertise in the collection of market- and operator-specific information on a continuous basis. However, as the online platforms that may be subject to the herein proposed transparency obligations are likely to span across different sectors, a "horizontal" authority, specifically, a competition authority may be better suited to take over this task. Consequently, it is suggested that the information should be given to the competition authority as the aim is to detect more easily and sanction more quickly

anti-competitive discrimination. Ideally, the responsibility may be awarded to the European Commission as most of the (legal or illegal) practices of the online platforms apply for the whole EU or at least have an important cross-border dimension.

Finally, the establishment of such a new obligation may first be tried with self- or co-regulation. If that proves to be ineffective, however, the obligation could be foreseen more formally in codified law. A possible legal point of entry in the European Union could be to amend Article 5 of the E-Commerce Directive (2000/31/EC), which already deals with transparency requirements for “information society services”, in order to extend its scope of application.

5. Conclusions, Future Research and Limitations

Discriminatory practices in the form of paid prominence and sponsored search can be found throughout the internet value chain by platforms that take an important role and are likely to possess considerable market power. As identified in the case studies (Section 2.2), “prominence” may be granted in several different ways, including, e.g., preferential access to APIs in OSs or delisting of competing products on e-commerce platforms. The European Commission worries that such discriminatory practices could possibly be harmful to downstream competition. Therefore, the European Commission announced that more scrutiny will be given to platform-to-business trading practices and the concern that some platforms may engage in discriminatory behaviour. In particular, an intermediary may engage in discriminatory behaviour by favouring its own products or services or by discriminating between different third-party suppliers and sellers.

The economic literature finds that discrimination in the form of paid prominence may sometimes be in the interest of consumers. In cases where content providers’ quality is pivotal, static efficiency is maximized if the platform can offer content providers paid prominence; if content providers differ mainly by price, welfare results may reverse. In any case, smaller or low-quality content providers are worse off if platforms can offer paid prominence. This gives rise to concerns regarding dynamic efficiency and long-term variety in those markets. Additional problems may arise if platform operators are vertically integrated with content providers. The extent to which such a bias can occur depends on the market power of the platform. In summary, from a static efficiency perspective, the economic findings do not support a general theory of harm with respect to the considered discriminatory practices that would warrant a wide ex-ante application of a non-discrimination rule. From a dynamic perspective, a non-discrimination rule seems more appropriate, but currently there is a lack of economic research to thoroughly support this claim.

Taken together, in our opinion, there is currently not a sufficient basis for a general ex-ante neutrality regulation for online platforms. However, concerns with respect to SMEs and long-term effects may still warrant additional safeguards for the enforcement of the general rules against unjustified discrimination, and the existing policy framework should aim at making those general

rules, such as competition law or consumer protection, more effective. Specifically, in order to improve the effectiveness of the enforcement of the rules and to make the procedures quicker, the imposition of a new proportionate obligation of transparency may need to be explored.

Finally, we also wish to point out some limitations of our work that may prompt future research. First, our insights were derived from a limited set of mostly theoretical papers. With the exception of de Cornière & Taylor (2017) none of these have explicitly addressed neutrality regulation for online platforms. In particular, none of the papers that we have surveyed have looked at dynamic welfare issues of a neutrality regulation with respect to how it affects the long-run competition between content providers. Thus, our conclusions are both limited by the lack of scope as well as the lack of the dynamic viewpoint of the extant economic literature.

Second, backed by our cases studies we have focused on “sponsored prominence” as a specific discriminatory conduct that is often pursued by online platforms. Of course, there may be numerous other reasons why a platform may engage in discrimination. Particularly the analysis of discrimination in the context of vertical integration from a dynamic viewpoint will include additional considerations. Among others, the firms’ access to data, the necessary scale of firms to effectively compete with other integrated ecosystems as well as coordination effects and systemic efficiencies then need to be taken into account.

Third, in these case studies, as well as throughout the whole paper, we have focused on discriminatory practices and the application of mandated non-discrimination (“neutrality regulation”) in vertical relationships (i.e., between the platform and either consumers or business that are intermediated by the platform), but do not consider the application of non-discrimination to horizontal relationships (i.e., across different platforms). For the latter issue, we refer to the public and academic debate on interoperability and its various applications. For example, in telecommunications markets, interconnection between networks has a long history, but interoperability is also discussed in the context of higher layers of the internet value chain (see, e.g., Bernstein et al., 2009, on cloud computing interoperability).

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