The Market Dominance of US Digital Platforms: Antitrust Implications for the European Union[1]

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ABSTRACT

The persistent dominance of US digital platforms relates to strategies that can be justified on efficiency grounds. However, these strategies might also offset competition and have ambiguous welfare effects. Overall, though, the economic literature does not provide a clear theoretical ground for a systematic regulation of their dominance, rather it advocates a targeting of specific unlawful anticompetitive practices. The examination of the rationale of antitrust intervention vis-à-vis global digital platforms suggests that EU authorities should adjust their doctrine and practice of competition policy to make it closer to the US approach. This realigning would serve the purpose of building a competitive EU digital ecosystem and a more balanced and efficient worldwide competition between all digital providers. In addition, EU competition authorities should also support price caps as welfare enhancing forms of cooperation, which could allow the emergence of platform pricing strategies within competitive markets and not only within monopolies.

JEL: L10; L40; O30.

I. INTRODUCTION

The markets of digital services are generally concentrated and tend to be dominated by a few very large digital organisations, mainly from the US (among which the *GAFAs* - *Google*, *Apple*, *Facebook*, and *Amazon*). Their enduring dominance in such highly innovative, strongly competitive and contestable markets raises a number of economic questions: what are the drivers of the creation and persistence of their dominance? What are the effects of such dominance on consumer and social welfare? Is there unambiguous rationale for a systematic regulation of these digital monopolies? Does the action of EU antitrust agencies against their economic practices provide benefits to digital stakeholders and end-users in the EU internal market? Then, how the European competition policy could work to foster the development of a digital ecosystem that would be competitive on a global scale?

The first part analyses the *GAFA*'s economic model and the effects of such model on the market structure and social welfare. This part explains how the strategies which have led to install *GAFA*'s persistent dominance rely to the exploitation of indirect network effects reinforced through the practice of tying and of restricting the compatibility or interoperability of their products and components. These strategies may have efficiency grounds as well as foreclosure consequences, with potentially ambiguous effects on consumer and social welfare. Hence, a public policy which would attempt to impose *ex-ante* remedies to break the dominance of these digital platforms may not necessarily produce a socially desirable outcome. A systematic regulatory intervention might indeed prevent dominant platforms to fully internalise the efficiencies of their economic model, leading to uncertain welfare effects.

The second part provides a comparative analysis of European and American antitrust actions vis-à-vis dominant digital platforms. This part brings evidence that the approach of the US authorities on the practices of dominant platforms is more oriented towards economic efficiency and innovation, and is therefore more prone to promote the development of a competitive digital industry.

In this respect, the US approach on antitrust should underpin a modernised European doctrine on competition policy, notably on the exercise of market power. In addition, the European competition policy could allow welfare-enhancing types of price cooperation between competing firms which provide interoperable offers, in order that they may globally behave as one single two-sided platform. This type of cooperation would represent an alternative to the dominance of closed, proprietary platforms, and allow preserving efficiency gains of network effects without bearing the burden of an enduring monopoly market structure that would have uncertain outcomes in terms of economic efficiency and welfare.

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[1] **US platforms dominance and EU antitrust.**

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II. The *GAFA*'s economic strategies and practices have efficiency grounds which maintain dominance and lead to ambiguous welfare outcomes

The economic model of the *GAFA* is based on the exploitation of the network effects inherent to two-sided markets. In order to develop and maintain their model, the globalised digital platforms rely to the practice of tying and may choose to restrict the compatibility of their networks. These strategies providing market power and installing a persistent dominance are discussed from the point of view of microeconomic analysis. The first part provides a description of the economic model of *GAFA* platforms. It then analyses the strategies that those platforms apply in order to increase their efficiency, which lead to gain monopoly power. It turns out that, in general, the strategies leading to the creation and the persistence of dominance may be explained on efficiency grounds even though they may foreclose competitors. The social welfare outcomes of these practices are generally ambiguous, and depend on other market characteristics such as the level of switching costs and the ability of end-users to multi-home.

A. The economic model of the *GAFA* is a two-sided platform with indirect network effects maximised through tying and compatibility restrictions

The broad range of digital activities encompasses the provision of digital intermediary inputs such as Operating Systems, software, IT infrastructure, as well as the online distribution of applications (Apps) and content through platforms of intermediation services. Though the *GAFA* provide a variety of digital services (*Search Engines, Social Networks, emailing, cloud computing, online trading, streaming media hosting…*), their core activity relates to the provision of content and applications in a Two-Sided Platforms business model.

1. *The GAFA core model is a Two-Sided Platform*

The digital actors provide a service of intermediation between distinct groups of users through Two-Sided Platforms. Typically, *Google* and *Facebook* are two sided-platforms of *advertising-based media*. *Google* is a *Search-based advertising* platform. Users are primarily attracted by the Search engine, which in turn attracts advertisers (on the other side of the platform) who purchase advertising space. Similarly, *Facebook* is a *Non-Search advertising* platform which attracts users with a social-networking service[2]. *Amazon* is an online trading (*e-commerce*) intermediation platform that connects consumers on one side and merchants on the other side, allowing transactions to occur at a lower research cost for consumers. *Apple* provides an intermediation platform (*App Store-iTunes*) which connects producers, contents and applications developers with end-users. In both *Amazon* and *Apple* web portals, the platform charges merchants and developers for selling their products to users, or charges users on behalf of the developers, such as in *iTunes*)[3]. Indirect network effects (or inter-group network effects), whereby *"users have larger expected gains, the larger the number of users on the other side of the market"*, are an essential feature of Two-Sided Markets which most often characterise the markets of online intermediation platforms[4].

2. *Indirect network effects in two-sided markets favour concentration and tipping*

The markets of Two-Sided Platforms are generally composed of a *subsidised* segment of users at one side of the platform and a *profit-making* segment at the other side of the platform[5]. A common business model of Two-Sided Platforms consists in subsidising the participation to the *free* side of the platform (generally *B2C*) in order to increase the participation and the value of the *profitable* side (generally *B2B*). The platform's owner offers a free service to the subsidised segment of users. The free service is funded by the revenues generated in the *profit-making* segment. According to the indirect network effects, a larger subsidised users' network increases the size of the *profit-making* or *profitable* side. The members of the *profitable* size expect to derive higher profits from participating to a platform which has a large group of subsidised buyers. In the presence of indirect network effects, a few first-moving platforms are likely to end-up attracting the majority of users and dominating the market, according to a *winner-takes-all, market tipping* effect[6]. Furthermore, a lack of interoperability or a restricted degree of compatibility between products available from competing platforms can reinforce users'

[2] *See* Florence Thépot, *Market Power in Online Search and Social-Networking: a Matter of Two-Sided Market*, CLES Working Paper Series 4 /(2012).
[3] *See* Martin Peitz & Tommaso M. Valetti, *Reassessing Competition Concerns in Electronic Communications Markets*, ZEW - Centre for European Economic Research, Discussion Paper No. 14-101 (2015).
[4] *See* Bernard Caillaud & Bruno Jullien, *Chicken & Egg*: *Competition among Intermediation Service Providers*, 34(2) RAND JOURNAL OF ECONOMICS 309 (2003).
[5] *See* Jean-Charles Rochet & Jean Tirole, *Platform Competition in Two-Sided Markets*, 1(4) JOURNAL OF THE EUROPEAN ECONOMIC ASSOCIATION 990 (2003).
[6] *See* Marc Rysman (2006), *The Economics of Two-Sided Markets*, 23(3) JOURNAL OF ECONOMIC PERSPECTIVES 125 (2006).

incentives to join platforms that have either the largest user base and/or the wider range of products. This in turn participates to the concentration of the market structure.

3. *High innovation and multi-homing do not hinder the drivers of market dominance*

The dominance acquired by the *GAFA*'s suggests that the competitive drivers of digital markets, (a high rate of technological innovation and the possibility of multi-homing[7]) do not seem to offset the drivers of dominance. On the contrary, *GAFA*s' market dominance tends to strengthen and persist over time. For example, the worldwide market share of *Google*'s Search engine has only decreased from 91% to 89% from 2010 to 2017[8]. Moreover, the world market share held by *Google*'s smartphone OS (*Android*) has increased from 4% in 2009 to 82% in 2016, while *Apple*'s OS (*iOS*) world market share has remained stable at 18% over the same period. In addition, *Google Chrome* is the world leader in the market of internet browsers. *Chrome* browser's market share has increased from 30% in July 2012 to 52% in February 2017. In the social networking market, *Facebook* has raised its market share from 8% in 2008 to 42% in 2016, and has been the world leader since 2008. The second largest online network, *YouTube* (which was acquired by *Google* in 2006), reached a 25% market share in 2016, starting from 7% in 2008[9]. Moreover, *Amazon*'s audience reach in e-retailing services in the US was of 70% in 2015. According to the European Commission (2015), *Apple* App Store and *Google* play led the market for applications (App) platforms in 2013[10]. Apple and *Google* accounted together for 85% of revenue from the worldwide purchase of Apps and for 60% of Apps downloads, where still growing by 37% in terms of downloads and by 88% in terms of revenue in 2013.

B. Tying supports *GAFA*'s economic efficiency and persistent dominance

The core strategy of the *GAFA* and of other digital leaders operating dominant platforms relates to the tying of complementary zero-price products with basic access to the platform. Such practice has the intent and the effect of increasing the size of users' groups and increases the economic value of platforms. The practice of tying generates benefits to both the platform owner and its end-users. The owner increases its market shares and revenues, while the end-users increase either the range of products they access at zero-price or the revenue they derive from selling their products to the platforms. From the point of view of the Chicago School of economics, the purpose of tying has efficiency rather than an exclusionary purpose, and does not consist, for a monopolist, in the leveraging of its monopoly power[11]. Indeed, in a market with complementary components of a single final product, a monopolist in one component has no rationale to foreclose competitors selling complementary components. The entire monopoly rent can be extracted without foreclosing rivals in the complementary markets, and the monopolist has no rationale of bearing the cost of a more intense price competition in the tied markets. A recent theoretical literature has however evidenced that a monopolist can derive additional profit in the tied market from the tying of its own sales. Under imperfect competition and non-constant returns to scale, the monopolist has a rationale for leveraging its monopoly power. Enduring monopoly power can then be explained by leveraging strategies based upon tying. The dominance of leading digital platforms is made persistent through both these applications of tying: as an efficiency driver and as a leveraging instrument[12]. Overall, though, the academic literature has not yet produced unambiguous conclusions on the welfare effects of tying and the related leveraging of monopoly power.

1. *Tying of complementary free products is a rational strategy to maximise efficiency*

The economic model of two-sided platforms consists in tying the basic access to the platform (the subscription) with a complementary product or component, most often a digital application or service. The bundle is offered for free to the consumers of the loss-making, subsidised side of the platform, and can be considered as an "input" being sold to the profitable side. The practice of tying as a mean to subsidise the free membership has the effect of increasing the participation on the *free* side of the platform and therefore, of increasing its attractiveness. Subsidisation of the free side increases the size of the indirect network effects on the profit-making side and also the value of the membership. As a result, tying allows the platform to provide the free bundle, which in turn expands both users' networks sizes and their economic value. Tying can therefore be

[7] "Multi-homing" refers to the capacity, for a user, to purchase a same type of services from different competing platforms in order to maximise the benefit the user reaps from network effects.
[8] Economic information on leading platforms' market shares are obtained from "Statista.com" website.
[9] Market shares are retrieved from "Dreamgrow.com" website and are expressed in terms of visits.
[10] Data are available from the "Digital Agenda Scoreboard" of the European Commission for the year 2015.
[11] *See* Robert H. Bork , *The Antitrust Paradox: a Policy at War with Itself*, Free Press, NY (1978); Richard A. Posner, *Antitrust Law: An Economic Perspective*, Chicago: University of Chicago Press (1976).
[12] Tying, when used in a context of dynamic leveraging, can have foreclosing effects on competitors. As a result, aside from efficiency motives, the tying of sales can have foreclosing intent and exclusionary effects.

viewed as a strategy to increase efficiency by improving the level of coordination between each side of the platform[13]. A Two-Sided Platform has an incentive to expand the variety of products tied to platform access. Indeed, a higher value of the bundle raises participation on the free, loss-making side. This in turn raises participation on the profitable side, through the indirect network effect. A larger group of free users on the loss-making side increases the number of users on the profit-making side, which raises the platform revenue. The coupling of indirect externalities with the incentive to decrease the price charged to the subsidised side (i.e. to expand the free bundle by adding new free products) in order to raise value on the profit-making side refers to a cumulative process.

2. *GAFA's market dominance is made persistent through leveraging strategies*

Contrary to the Chicago School's claim that tying can only have an efficiency purpose, a more recent stream of theoretical literature has evidenced that the tying of sales by a monopolist can be used to leverage its monopoly power. In the context of uncertain returns on investment in innovation, increasing returns to scale, and the existence of a threat of entry, this literature show that the monopolist has an economic rationale to leverage its monopoly power, as a profit can be derived from monopolising the tied market. The extension of monopoly power to newly emerging markets through leveraging strategies is an additional mean to permanently maintain dominance in globalised digital markets. The leveraging of monopoly power consists in tying the sales of the monopolised product with another product facing a certain degree of competition in its own market. Such leveraging strategy will tend to maintain monopoly power in the core market, while allowing to extend it to the tied market. A systematic application of leveraging in the digital sector, where the rate of technological progress is fast and the dynamics of market creation is intense is a mean to install a permanent global dominance.

Leveraging leads to persistent dominance by foreclosing rivals or deterring entry

Tying can be used by the monopoly platform as a mean to exclude its rivals in the tied market, or to discourage entry from new competitors. In the presence of scale economies, tying can allow the monopolist to foreclose the sales of the tied product, which occurs because once the monopolist has engaged in tying it can only derive profits from its monopolised product by increasing the sales of the tied products in conjunction with the monopoly product. This leads to a more aggressive pricing strategy from the monopolist, which lowers the profit of the monopolist's tied product rivals, up to the point where their activity becomes unprofitable, leading them to exit the tied market[14]. It appears that a platform has a rationale to make its monopoly power enduring through the monopolisation of tied products markets, and that such monopolisation relates to tying.

In a two-sided market structure, a monopoly platform has an economic incentive to bundle its monopolised product with another complementary product under a non-negativity price constraint, in order to preserve and reinforce its initial monopoly power. Tying allows to continuously extending the scope of services available to end-users at zero price, which amount to circumvent the negative price constraint. As competing platforms which produce only one product cannot rely to tying, they cannot circumvent the non-negativity price constraint. As a result they cannot engage in a fierce price competition with the incumbent monopolist. Tying is made more profitable, and the monopoly power of the incumbent increases over time in the primary market and can extend to the complementary market[15].

Tying in an initial period can increase and extend monopoly power in future periods

A dynamic leveraging strategy can lead the dominant platform to increase its future profits in its primary, core market while permanently extending its current monopoly power to newly emerging markets. This strategy consists in tying the monopolist's product with a complementary product that has economies of scale due to a positive cost of entry. In the presence of network externalities, tying in the current period can deter future entry of efficient rivals into the primary core market and into the related, complementary market as well. Tying has an

[13] *See* Andrea Amelio & Bruno Jullien, *Tying and freebies in Two-Sided Markets*, 30(5) INTERNATIONAL JOURNAL OF INDUSTRIAL ORGANIZATION 436 (2012).

[14] *See* Michael D. Whinston, *Tying, Foreclosure, and Exclusion*, 80 AMERICAN ECONOMIC REVIEW 837 (1990). According Michael D. Whinston, tying is a profitable strategy for the monopolist because it has the potential for excluding his rival in the tied market, thus allowing to leverage the initial monopoly power. The exclusionary effect arises because of "strategic foreclosure", which occurs because tying is viewed as a commitment to foreclose the sales in the tied product market. As the tying firm engage in more aggressive pricing in the tied product market in order to reap the benefits from bundling, rivals will lower their own prices, driving their profits down. Tying becomes profitable for the tying firm and its rivals are led to exit the market as their price reaches a too low level. However, when the tied products are complementary, the monopolist has no incentive to rely to tying in order to induce exit in the market for the other component. As the monopolized component is essential for using the final product, the monopolist can always reap profit in a competitive non-monopolised market, through the sales of its monopolised product. Hence, tying ceases to be a profitable exclusionary strategy.

[15] See Jay Pil Choi & Doh-Shin Jeon, *Leverage Theory of Tying in Two-Sided Markets*, Working Paper N°TSE-689 (2016).

entry deterrence effect because the incumbent's competitors would derive a lower profit from the sales of the complementary product in the newly emerging market. Moreover, in a two-period setting where the current monopoly product is rendered obsolete by the product developed in the new market, tying has both leverage intent and a foreclosure effect. The monopolist can initially bundle both products in order to remain dominant in the new market and retain its monopoly profit despite the obsolescence of its initial monopoly product[16]. Furthermore, in the markets for digital platforms, where the rate of technological progress is high and the lifetime of products can be short, the transfer of monopoly power through the tying of complementary products has the effect of discouraging entry from alternative producers. In this setting, the monopoly platform has an incentive to accelerate the pace of innovation and to rapidly bundle the new generations of primary products with the complementary products, in order to make its monopoly power enduring in the core market and in market of the tied complementary component[17].

The acquisition of potential competitors can install persistent monopoly power

The monopoly platforms can acquire smaller providers of digital technologies and services in order to incorporate such external capacity to innovate into their own organisation. By acquiring smaller innovators, the large dominant digital platforms can pre-empt innovation from potential competitors that could otherwise have diversified enough to steal incumbent's profits away, as it could be the case in the *Facebook/WhatsApp* merger[18]. The persistence of dominance in markets of digital platforms results either from a static strategy or a dynamic strategy. The static strategy consists in overcoming the effects of multi-homing by exploiting the economic properties of bundling. The dynamic strategy consists in a permanent extension of the scope of digital services by the owner, either by producing its own innovations and coupling them with basic access to the free side of the platform, or by acquiring innovative start-ups.

3. *Strategies leading to GAFA's persistent dominance have ambiguous welfare effects*

In the theoretical literature, it is not yet clear whether a two-sided market with a dominant or monopoly platform will lead to beneficial or detrimental effects on consumer welfare and social welfare[19]. An analysis of this stream of economic literature tends to suggest that overall, the effects of platforms' dominance on competition and on social welfare depend notably upon the size of the indirect network effects, the potential leveraging of market power, and the extent to which consumers can access sufficiently compatible products from competing platforms. Digital platforms can acquire market power and remain dominant in the long run through the tying of complementary products that have indirect network effects.

A general result from the microeconomic theory indicates that a firm which has monopoly power in two products can strategically choose to bundle them in order to deter entry of competitors in only one or both products' markets[20]. Such a bundling strategy can preserve the monopoly power of the incumbent firm, and increases its profit as well, either in the case of entry or absent entry. In the theoretical literature, the competitive and welfare effects of tying depend on its purpose. Various studies which shed light on these effects consider a specific strategic intent of tying, on the basis of which the effects on competition, consumer and social welfare are analysed.

Tying as a mean to increase participation to a monopoly platform is welfare improving

A theoretical analysis of the economics of two-sided markets has evidenced that the tying of the basic access to a monopoly platform with a range of free complementary products has the effect of increasing consumer surplus on both free and profitable sides of the platform[21]. As a matter of fact, the practice of tying by the monopolist subsidises free membership, thus participation increases on both sides of the platform due to indirect network effects. In a duopoly market, as opposed to a monopoly market, the consumer surplus decreases if both owners of competing platforms engage in tying when the indirect network effect is strong. Social welfare is not

[16] *See* Dennis W. Carlton & Michael Waldman, *The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries*, 33(2) RAND JOURNAL OF ECONOMICS 194 (2002).
[17] According to Dennis W. Carlton and Michael Waldman, it is markets that have substantial innovation where products lifetimes are short that tying will be likely to be effective in preserving and extending the initial monopoly position of the incumbent platform (provided that there are network externalities and economies of scope).
[18] *See* Nicolai Van Gorp & Stephanie Honnefelder (2015), *Challenges for Competition Policy in the Digitalised Economy*, 99 DIGIWORLD ECONOMIC JOURNAL, 149 (2015).
[19] *See* Justus Haucap & Ulrich Heimeschoff, *Google, Facebook, Amazon, eBay: Is the Internet Driving Competition or Market Monopolization?*, Discussion Paper No 83 Düsseldorf Institute for Competition Economics (DICE), (2013).
[20] *See* Barry Nalebuff, *Bundling as an Entry Barrier*, 119(1) THE QUARTERLY JOURNAL OF ECONOMICS 159 (2004).
[21] *See* Andrea Amelio & Bruno Jullien, *Tying and freebies in Two-Sided Markets*, 30(5) INTERNATIONAL JOURNAL OF INDUSTRIAL ORGANIZATION 436 (2012).

hindered, because market shares and profits of both competing platforms are not decreased. When only one of the two competing platforms' owners engage in tying, in the case where only the profitable side of the platforms have positive indirect externalities, consumer surplus increases on each side, and total welfare can either increase or decrease, depending on the strength of the network externality. In the context where both inter-group externalities are positive, there exist a configuration where tying by one of the two competing platforms can increase total welfare. When both inter-group externalities are of comparable size, total consumer surplus increases while total welfare decreases. Overall, the effect of tying on social welfare in this context depends on the relative levels of network effects on each side of the two-sided platform[22].

Tying as an entry and innovation deterrence strategy tends to undermine welfare

In dynamic and innovative markets such as digital markets, where firms operate online intermediary platforms or software platforms, the tying of two complementary components by an incumbent monopoly platform can have the effect of deterring entry. When the incumbent platform has a monopoly power in all complementary products, when potential competition exist in all complementary markets, and investment has uncertain returns, the tying of complementary products by the monopolist hinders rivals' incentives to innovate. As entry in one market is profitable only if entry in the complementary market is also profitable, tying hinders the expected returns on entry, and discourages investment and innovation. As a result, the practice of tying as a mean to deter entry can harm consumer and social welfare because potential innovation from entrants has not occurred[23]. In such cases of dynamic leveraging of monopoly power through the tying of complementary products, consumer welfare could be hindered. Indeed, entry from alternative innovators is discouraged by their lack of investment's prospects in the complementary market, which can be detrimental to variety and quality, thus can undermine consumer welfare.

Tying can be used by a dominant firm as an explicit strategy to hinder rivals' incentives to invest in innovation. When firms compete in deterministic R&D investments, the tying firm can affect its rivals' incentives to innovate, which makes tying a profitable strategy. As tying allows to increase the market shares of the tied product, the costs of R&D investment decrease. Any decrease in the production costs resulting from R&D investment thus results into higher profit, and lower rivals' incentives to innovate[24]. Tying can be a monopolist's profitable strategy even in the absence of exit in the tied product market, if the benefits from R&D cost reductions outweighs losses from the intensified price competition. The impact of social welfare is negative because the foreclosure effect of tying reduces the rivals' incentive to invest in R&D, depriving consumers from potential innovations. However, the welfare effect could be positive in the case of uncertain R&D investment outcomes, as tying could serve as a coordination tool, avoiding costs from duplications in R&D activities.

Tying under multi-homing always improves welfare

In digital markets where a platform with monopoly power applies a tying strategy, the competitive intensity can be maintained through the possibility for consumers to rely to multi-homing. For example, a platform owner with a monopoly on the component essential for consumer participation can bundle this component with the access to the free side of the platform. This can lead to lock-in effects as consumers are not allowed to obtain the essential component, or competing components, from alternative providers. In this context, the possibility of multi-homing is sufficient to prevent the foreclosure of competing components, and to offset the dynamics of consumer lock-in and market tipping[25]. The practice of tying leads more consumers to multi-home and increase the amount of products available for members of the free side of the platform. As a result, the practice of tying in the presence of multi-homing enhances consumer welfare and social welfare.

4. Conclusion: the tying of free products on efficiency grounds creates and maintain GAFA's market dominance, and has overall ambiguous welfare effects

The *GAFA* have acquired their dominance through the practice of bundling. In general, the bundling of free complementary products with the purpose of subsidising the free users' side of the platform can be explained on

[22] In the model developed by Andrea Amelio and Bruno Jullien, the strength of network effects relates to the capacity of a platform to permanently extend the range of bundled services offered at zero price. A strong indirect network effect rapidly increases the revenue on the profit-making side which subsidises the free end-user side, which benefit from a growing variety of free services. As such increase in efficiency occurs with the monopolisation of the market, a monopoly market structure might enhance social welfare.

[23] *See* Jay Pil Choi & Christodoulos, *Stefanadis, Tying, Investment, and the Dynamic Leverage Theory*, 32(1) THE RAND JOURNAL OF ECONOMICS 52 (2001).

[24] *See* Jay Pil Choi, *Tying and Innovation: a Dynamic Analysis of Tying Arrangements*, 114 THE ECONOMIC JOURNAL 83 (2004).
In the model of Jay Pil Choi tying can be a profitable strategy even in the absence of exit in the tied product market, if the benefits form R&D costs reduction outweighs the negative effect of price competition.

[25] Jay Pil Choi, *Tying in two-sided markets with multi-homing*, 58(3) THE JOURNAL OF INDUSTRIAL ORGANIZATION 607 (2010).

efficiency grounds. Its scope is to attract users on the profit-making size through the indirect network effect, which increases the monetary revenue of the platform, and its market shares. The practice of tying is used to maximise the efficiency of its economic model, and has not necessarily the intent of restricting competition. Tying can, however, potentially have foreclosing effects. Overall, these foreclosing effects of tying by dominant platforms can be prevented or mitigated by the possibility of consumers to multi-home. The availability of tied products from several competing platforms will overcome the foreclosing effect that tying from a dominant platform can have on its close competitors.

C. Two-sided digital platforms have a rationale for incompatibility

The preferences of two-sided digital platforms in terms of compatibility can influence the intensity of competition and the level of efficiency and social welfare[26]. The platforms generally favour incompatibility over compatible products in order to raise the efficiency of their economic model. Restricting the compatibility of products when indirect network effects are sufficiently strong leads platforms to compete fiercely for an installed consumer base. Even when incompatibility is exogenously given, platforms can engage in fierce price competition for a consumer installed base. Overall, according to a recent economic literature, the restriction of compatibility in two-sided markets has contrasted effects on competition, efficiency and related welfare, depending notably on the strength of network effects, the level of consumer's switching costs and the extent to which multi-homing is possible.

1. *In the presence of network externalities, incompatibility has efficiency grounds and can induce fiercer competition*

Aside from the practice of tying, Two-Sided platforms can use the incompatibility of their products (services or technologies) as a mean to increase the efficiency of their economic model. Restricting the compatibility of their products relates to a rational strategy to exploit indirect network effects, without necessarily willing to foreclose competitors.

The theoretical literature has stressed that with incompatible products and strong network effects, competing platforms have an incentive to rapidly build a consumer base, in order to gain a strategic advantage in the future competitive stages. This advantage relates to a sufficiently large installed consumer base, which can hinder rival's incentives to enter the market in the future periods. In markets with indirect network effects and incompatible products, platforms can engage in fierce competition to capture crucial types of agents such as early adopters or "pivotal users"[27]. As the size of the subsidised, "free" consumer base determines the size of the profitable group of users (as a result of indirect externalities) it is crucial for platforms to rapidly gain market shares in order to install their dominance over time. If compatibility is introduced (or incompatibility is lowered), the competitors will capture a share of the incumbent's customer base. As a result, the introduction of compatibility will hinder incumbent's incentives to lower its prices, as they otherwise would do to gain market shares and benefit from the market tipping effect.

The economic literature has also evidenced that a market with incompatible network goods and entry deterrence strategy of an incumbent actor can exhibit fierce competition and not necessarily be detrimental to welfare. In such model, competition occurring between incompatible network goods is fiercer than between compatible network goods, as the stake is to capture the entire market at an early stage. In a market with direct network externalities where the incumbent faces a threat of entry from rivals selling an incompatible good of higher quality, the incumbent will have incentives to deter entry. The incumbent sets a lower price than it would have done otherwise in order to increase rapidly its installed customer base. This in turn reduces the profitability of the next potential entrant, which would have to set a too low price in order to compete with the incumbent. The welfare effects resulting from additional entry are overall ambiguous, as the model explicitly allows for excessive entry to occur[28].

In addition, competition between closed, non-compatible, ecosystems of platforms can be more intense than competition between open and compatible ecosystems. A platform which product is compatible with those of its direct competitors could indeed refrain from lowering the price of its own product because compatible competitors would benefit from such price decrease. The incompatibility of products leads to consumer lock-in, and the purchase of products which cannot be used on other platforms (or be interconnected with networks of

[26] The compatibility of a product refers to the ability for a platform user to use a product that has been developed by another platform, or to the ability for a member of a network to interconnect with alternative networks.
[27] *See* Bruno Jullien & Wilfried Sand-Zantman, *Network Effects*, Report, IDEI-TSE (2016).
[28] *See* Drew Fudenberg & Jean Tirole, *Pricing a Network Good to Deter Entry*, 48(4) THE JOURNAL OF INDUSTRIAL ECONOMICS 373 (2000). The impact of additional entry on welfare relates to difference between the equilibrium and the optimal amount of entry. It relates to the gap between private and social return from entry. The private return from entry does not incorporate the welfare loss incurred by users who rely to the incumbent's good, while it includes "rent-stealing" from the incumbent, and tends to promote excessive entry.

other platforms) generates switching costs that can hinder competition. If switching costs are not too high, though, competition between incompatible platforms can deliver higher benefits to the consumer than competition between compatible platforms[29].

2. *Monopoly power installed on incompatibility can be favourable to social welfare*

Platforms in Two-Sided markets with a subsidised free-side of users have an incentive to favour incompatible networks and products, despite the less intense price competition that would occur between compatible platforms. Indeed, if the level of product differentiation between competing platforms is low, platforms may prefer incompatibility because it can increase their profit level and lead to market dominance. Competing platforms may initially prefer to gain market power than agreeing on compatible products. Under weak horizontal differentiation, the choice for incompatible products can lead to higher social welfare than compatibility, because compatibility would lead to excessive market entry. A market structure with a monopoly platform under a credible threat of entry would then lead to a preferable outcome in terms of social welfare[30].

Moreover, a Two-Sided monopoly platform which provides two complementary components and chooses to upgrade only one of them has an incentive to make the improved component incompatible with the other component, because it will allow increasing its profit. This "*planned obsolescence*" strategy of making the improved component incompatible will unambiguously increase social welfare if users of such component can rely to multi-homing, which offsets the negative effect that incompatibility would have on welfare. Indeed, multi-homing increases the number of users of the improved component, which in turn decreases the monopoly power of the platform. If multi-homing is not allowed, however, the effect of incompatibility on welfare becomes ambiguous[31].

Emerging research argues that with markets of two-sided platforms with incompatible products, efficiency losses from consumer lock-in are much less significant than efficiency losses from market fragmentation. Inefficient market fragmentation would weaken network effects, which would lead to a lower level of social welfare than under efficient market tipping which leads to monopoly[32]. As a result, it is not the strategic choice of incompatibility which might hinder social welfare, but rather the insufficient internalisation of indirect network effects in over-fragmented markets.

3. *The choice of incompatibility can also lead to undesirable social welfare outcome if switching costs are high*

If switching costs are high, the economic literature provides evidence of a negative welfare effect from the strategic choice of incompatibility. In Two-Sided markets where products are not differentiated, the compatibility of products, which refers to the interconnection of different users' networks, is welfare-increasing compared to incompatible competition even when widespread multi-homing is allowed. Indeed, multi-homing can weaken price competition among platforms with incompatible products, which reduces platforms' incentives to favour compatibility (when it would be socially desirable to prefer compatible products), and thus hinders social welfare. Moreover, the presence of strong network effects and consumer multi-homing can lead dominant platforms to prefer (socially inefficient) incompatible competition over (socially efficient) compatible competition because incompatibility deters entry[33]. In the presence of network effects and switching costs, incumbent platforms (firms with a large installed base) may prefer incompatible products in order to weaken competition from rivals who would otherwise be more efficient under compatibility. The strategic choice of incompatibility by the dominant platform reinforces consumers lock-in and prevents them from reaping the combined value of previously incompatible ranges of products. Incompatibility can thus be more profitable for the dominant platform. The Strategic choice to restrict compatibility may indeed reinforce market power of the dominant platform, weakens competition and deters entry from potential rivals. In this context, it can thus hinder efficiency and social welfare[34].

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[29] *See* Nicolas Colin, Augustin Landier, Pierre Mohenc & Anne Perrot (2015), *Economie Numérique* Les notes du conseil d'analyse économique, n° 26. http://www.cae-eco.fr/IMG/pdf/cae-note026.pdf.

[30] *See* Ramon Casadeus-Masanell & Francisco Ruiz-Aliseda, *Platform Competition, Compatibility, and Social Efficiency*, Working Paper 09-058, Harvard Business School (2009).

[31] *See* Chun-Hui Miao, *Compatibility in Two-sided Markets*, Mimeo, University of South Carolina (2007).

[32] *See* E. Glen Weyl, *Let the Right 'One' Win: Policy Lessons from the New Economics of Platforms*, Coase-Sandor Working Paper Series in Law and Economics No. 709 (2014).

[33] *See* Toker Doganoglu & Julian Wright, *Multi-homing and compatibility*, 24 INTERNATIONAL JOURNAL OF INDUSTRIAL ORGANIZATION 45 (2006). Firms have excessive incentives to prefer compatibility in the absence of multi-homing. The presence of multi-homing reduces theses excessive incentives, and imposes duplicated costs for consumers who have to buy twice. A benefit of compatibility is the elimination of duplicated costs that consumers incur due to multi-homing, and this benefit is not internalised by firms. Firms may indeed prefer incompatibility in the presence of multi-homing even when choosing compatibility would be socially desirable (because of the lower costs imposed on consumers).

[34] *See* Joseph Farrell & Paul Klemperer, *Coordination and Lock-In: Competition with Switching Costs and Network Effects*, Switching Costs and Network Effects, in: Handbook of Industrial Organization, Volume 3, edited by M. Armstrong and R. Porter, (2007).

In addition, in a dynamic setting (where platforms can decide on compatibility over two periods), in the presence of high consumer's switching-costs that reinforce lock-in effects, Internet platforms are more likely to keep their products incompatible if they have chosen to do so in the first period. The rationale for compatibility restriction consists in lessening competition in the future (because of high switching costs), even at the cost of higher level of first-period price competition. The strategic choice of incompatibility decreases welfare under high switching-costs. As a result, intense competition in an early stage of digital market development can be followed by weak competition in more mature markets, where platform behave like isolated "islands"[35].

In markets of online intermediation services (i.e. markets with two-sided platforms and indirect network effects), when multi-homing is not allowed (services are exclusive), monopoly can be an efficient market structure. Under multi-homing, (when services are non-exclusive), competition is softened as market are less contestable, which allows platforms to raise prices, and may lead to inefficient market equilibrium. Conversely, under exclusive services, market structures are "highly contestable" as competition between intermediation platform is exacerbated, leading to the dissipation of profits[36].

4. *Conclusion: incompatibility does not necessarily relate to anticompetitive behaviour and hinder welfare except when switching costs are high*

Although less developed that the literature on the economic effects of tying, the academic analysis on the effects of restricted compatibility indicates that such strategy can be associated with efficiency objectives, and can induce fiercer competition than a policy of open and interoperable products. A market with two-sided platforms which compete on incompatible products can produce a higher level of social welfare than they would under a compatible framework under specific conditions. Those conditions relate to platforms' strategy (the degree of product differentiation), to the market frame (the extent to which consumer can rely to multi-homing), or both (the level of switching costs). However, the choice of incompatibility by platforms with market power can potentially hinder competition when the switching costs are high enough to create consumer lock-in. However, the fiercer price competition arising among incompatible -closed proprietary platforms or the possibility for consumer to multi-home can effectively mitigate the potential anticompetitive effects resulting from the strategic choice of incompatibility by dominant platforms.

Conclusion of part II: A systematic regulation of GAFA's practice of tying and compatibility restriction is not justified on efficiency and welfare grounds

The academic literature has evidenced that the creation and the persistence of monopoly power in digital markets of platforms result from the efficiency of their economic model and do not *a priori* or systematically result from practices that have foreclosing intent or effects. The practice of tying has efficiency grounds as it increases both the range of products available to users and the profit of the platform. The leveraging of monopoly through tying can potentially have anticompetitive effects that although can be mitigated by multi-homing. In addition, the choice of incompatibility in the perspective of gaining or maintaining market power can enhance consumer welfare and social welfare, provided that lock-in effects are not too strong.

Overall, the related welfare effects are ambiguous. In light of the literature, though, a public policy which would be dedicated at breaking Two-Sided Platform dominance may not necessarily produce a socially desirable outcome. Indeed, impeding dominant platform owners to extract the benefit of their indirect network effects could impair the maximisation of social welfare, as long as externalities can only be internalised within a single firm, notably when there are strong indirect network effects, when consumer multi-homing is possible and switching costs are not too high.

III. US digital leaders' dominance should lead EU authorities to follow US antitrust approach and doctrine on the exercise of market power

The analysis of the economic literature has suggested that the exercise of *GAFA*'s market power has ambiguous welfare effect which does not imply a systematic regulatory action from the European authorities. It rather necessitates a focused intervention against a limited range of unlawful practices with anticompetitive effects. This second part examines recent antitrust action against the US digital leaders in the European Union and in the

[35] *See* Doh-Shin Jeon, Domenico Menicucci & Nikrooz Nasr, *Dynamics of Compatibility under Switching Costs*, Ninth IDEI-TSE-IAST Conference on The Economics of Intellectual Property, Software and the Internet (2016).

[36] *See* Bernard Caillaud & Bruno Jullien, *Chicken & Egg*: *Competition among Intermediation Service Providers*, 34(2) RAND JOURNAL OF ECONOMICS 309 (2003). In the model of entry, the intermediary platform chooses to enter the market with exclusive services when its quality is sufficiently high, which enables to deter entry and lead to a market-tipping effect. By contrast, the incumbent platform chooses nonexclusive services when its level of quality is low. It can be ruled out of the market if high-quality entrants choose exclusive services (consumers cannot multi-home).

US, and draws conclusions on how an upgrade in European competition policy doctrine and practice could work to build a competitive digital ecosystem.

The first section explains how competition authorities in the European Union and in the US have addressed the monopoly power of the *GAFA*, and more generally of the US digital leaders which operate monopoly platforms. The comparative study of antitrust action in both regions evidences that the US Courts and agencies focus on redressing unlawful anticompetitive conduct whereas the EU authorities have put more effort in scrutinizing unintended anticompetitive effects which might result from legal practices. They have thus redressed pro-competitive practices with potential unintended anticompetitive effects. The following section argues that the approach of EU and US antitrust agencies as regards the digital economy reflects their different views on the nature of competition, the exercise of market power and ultimately their different doctrine and practice of competition policy. It then discusses how, in order to adapt to the technological progress propelled by the *GAFA*, the European competition authorities should make their approach on the exercise of market power converge towards the US doctrine, which has proved to be more conducive to economic efficiency and innovation. The third section argues that competition policy should acknowledge that specific forms of price coordination between independent firms may induce welfare enhancing effects. Such renewed approach of EU competition authorities on cooperation would allow the development of two sided platform pricing strategies within the frame of competitive markets, thereby avoiding the side effects of monopoly market structures.

A. The monopoly power of leading digital platforms is heavily scrutinized in the EU while the US authorities only focus on illegal monopolisation practices

The creation and the persistence of *GAFA*'s dominance do not systematically derive from practices having anticompetitive intent. In digital markets with network effects and rapid technological progress, monopoly power may result from competition on the merits, and does not preclude the maximisation of efficiency and related social welfare. On the basis of the economic analysis developed in the first section, it appears that competition authorities should not consider the exercise of monopoly power by dominant platforms as an offense *per se*. In order not to harm innovation and to avoid undesirable welfare outcomes, actions in competition law should only be taken if digital monopolies abuse their dominant position and engage in exclusionary or restrictive practices that have actual anticompetitive effects.

In the European Union, several actions occurred in the digital sector over the last fifteen years. These actions were meant to deter and possibly to sanction the abuse of dominant positions from the US leading digital platforms. A number of their strategic behaviours, as for instance tying, the related leveraging of monopoly power, and the restrictions on interoperability have led the European competition agencies to impose remedies and financial sanctions. In the European Union, such practices have been under systematic review[37]. The Commission has had a sustained antitrust action against *Microsoft* and *Google* over the last fifteen years, which led to sanction *Microsoft* and to currently maintain *Google* under investigation. Overall the EU authorities have initiated a larger number of antitrust proceedings against the US leading digital platforms over the last fifteen years. The US authorities have closed all their investigations with settlement agreements as dominant actors have committed to refrain from illegally distorting competition. By contrast the EU antirust activity against those dominant actors has been more intense, and the scope of scrutinised practices has also been wider. Proceedings by the Commission (the Directorate-General for competition) have led to several sanctions for abuse of dominant position. In particular, the practices of tying as either a mean to maximise efficiency gains from network effects or to leverage monopoly power, and restrictions on the compatibility of proprietary platforms have been redressed.

1. Dominant digital platforms strategies are more scrutinized and sanctioned in the EU

The European Commission stated in 2004 that *Microsoft* had leveraged its monopoly power in the market for PC Operating Systems (OS) to gain a new monopoly position on the market for work group servers OS and for Media Players[38]. According to the Commission, *Microsoft* has abused its market power by two means. Firstly, by restricting interoperability between its own Windows Operating System and Non-*Microsoft* work group servers. Secondly, by tying its Windows Media Player (which faced competition in its market) with its own Windows Operating System, a product in monopoly position in its market[39]. *Microsoft* was ultimately sanctioned for

[37] *See* Ilsa Godlovitch, Bas Kotterink, Scott Marcus, Pieter Nooren, Jop Esmeijer, Arnold Roosendaal, *Over-the-Top (OTTs) players: Market dynamics and policy challenges*, Study for the IMCO Committee European Parliament, Directorate General For Internet Policies (2015).

[38] *See* Nicolai Van Gorp & Olga Batura, *Challenges for Competition Policy in the Digitalised Economy*, Study for the ECON Committee, European Parliament (2015). Nicolai Van Gorp and Olga Batura analyse the case of *Microsoft* strategic leveraging which have been investigated by the European Commission on the grounds of abuse of dominant position.

[39] The Commission has imposed conduct remedies to *Microsoft* Corporation (an obligation to disclose information to enable interoperability and thus competitors' entry in the market for work group servers) and a €497 million fine for having restricted interoperability of its Windows operating system and tied it to its own media player: http://europa.eu/rapid/press-release_IP-04-382_en.htm?locale=fr

having impaired competition by relying to tying and imposing restrictions in the interoperability of its platforms. In addition, the European Commission stated in 2009 that *Microsoft* had abused its dominant position by tying its web browser ("*Internet Explorer*") to its dominant Windows Operating System. Such tying has provided an unfair competitive advantage to *Microsoft*, which apparently denied Windows users the ability to choose alternative web browsers[40]. *Microsoft* was ultimately sanctioned by the Commission after failure to comply with its commitment to enable a fair competition in the market for web browsers available to Windows users[41].

The European antitrust agency has also opened several inquiries on *Google*'s assumed unfair methods of competition, in particular related to tying and leveraging of dominant position. The European Commission opened in April 2015 a formal investigation on *Google*'s anticompetitive exploitation of its Android mobile Operating System, which notably entailed a restriction in Android's interoperability, the tying of *Google* Search and web browser Chrome to mobile devices, and the tying of *Google*'s own applications and services to Android[42]. One year later, in April 2016, the Commission sent a Statement of Objections to *Google*, confirming its preliminary views that *Google* has abused its dominant position through the anticompetitive exploitation of Android and its related Search and web browsing services, notably through agreements aimed at foreclosing rival applications[43].

In addition, following an initial antitrust investigation opened in 2010, the Commission has recently confirmed its preliminary view that *Google* might have abuse its dominant position in the market for online Search[44]. The Commission indeed sent a Statement of Objections to *Google* in April 2015 on the grounds that *Google* had given an unfair advantage to its tied comparison shopping service in online search results[45]. Furthermore, in July 2016, after additional inquiries, the Commission has issued new Statement of Objections outlining further evidence that *Google* has systematically favoured its own shopping services over those of closest rivals, and that *Google* has also restricted the ability of online search advertisers to fairly compete with its "*AdSense for Search*" platform[46].

In June 2017, the Commission confirmed its April 2015 Statement of objection and came to the conclusion that *Google* has indeed abused its dominant position as a Search engine, used as a mean to give unlawful advantage to its own comparison shopping service, and imposed a €2.42 billion fine for breaching European antitrust rules. According to the Commission, *Google* has, since 2008, systematically favoured its own comparison shopping service, and demoted the comparison shopping services of its competitors in its search results, which has impaired fair competition in the market for comparison shopping[47]. In this specific case, the Commission has gathered comprehensive evidence that the practice consisting of leveraging *Google*'s pre-existing dominant position in the market for Search has indeed impaired competition on the merits in the related market for shopping services and has lowered the general quality of shopping services for end-users[48].

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[40] The European Commission sent a Statement of Objections to *Microsoft* in January 2009 on the anticompetitive tying of Internet Explorer to Windows: http://europa.eu/rapid/press-release_MEMO-09-15_en.htm?locale=en

[41] The European Commission imposed a €561 million fine to *Microsoft* for failing to comply with commitment to offer users the possibility to easily choose alternative web browsers not tied to the Windows operating system. The Commission indicates that it is the first time that it had to fine a company for non-compliance with a commitment decision: http://europa.eu/rapid/press-release_IP-13-196_en.htm

[42] The European Commission intends to state whether *Google*'s has illegally "*hindered the development and market access of rival mobile applications or services*" by requiring manufacturers to exclusively pre-install *Google*'s application and services (*Google* Search and *Google* Chrome browser) on their devices, by preventing device manufacturers from developing alternative versions of Android, and by tying *Google*'s applications and services distributed on Android to other *Google*'s applications, services and Application Programming Interfaces (APIs): http://europa.eu/rapid/press-release_MEMO-15-4782_en.htm.

[43] The European Commission Statement of Objections to *Google* on Android operating system and applications, published on 20 April 2016 indicates that the Commission alleges that *Google* has required manufacturers to exclusively pre-install *Google* Search and *Google* Chrome browser on their devices, preventing mobile device manufacturers from installing competing OS based on Android open source code, and providing financial incentives to mobile manufacturers and operators to exclusively pre-install *Google* Search on their mobile devices: http://europa.eu/rapid/press-release_IP-16-1492_en.htm

[44] The initial Commission's investigation on *Google*'s antitrust violations, opened in November 2010, concerned a range of *Google*'s potentially anticompetitive practices related to biased online Search, exclusivity obligations imposed on advertising partners, and portability restrictions imposed on online advertising campaign data. The main focus of the Commission was the potential abuse of dominant position in the market for online search, where *Google* might have favoured its own services in the search results, at the expense of its competitors' links: http://europa.eu/rapid/press-release_IP-10-1624_en.htm

[45] The recent investigations opened by the European Union concern *Google*'s potential unfair advantage given to its own comparison shopping service. The Commission stated that "*an unfair advantage to its own comparison shopping service" by artificially diverting traffic from alternative shopping services, thereby undermining their ability to compete effectively with "Google shopping"*": http://europa.eu/rapid/press-release_IP-15-4780_en.htm.

[46] In the July 2016 Statement of Objections, the Commission reinforced its preliminary conclusion that *Google* "*has abused its dominant position by systematically favouring its comparison shopping service in its search result pages*". *Google* might also have restricted the ability of third party websites to display search advertisements provided by its rivals notably through its "*AdSense for Search*" platform, to "*protect its dominant position in online search advertising*". For the Commission, these anticompetitive behaviours have enabled *Google* to protect its dominant position in online search advertising: http://europa.eu/rapid/press-release_IP-16-2532_en.htm

[47] *See* http://europa.eu/rapid/press-release_IP-17-1784_en.htm.

[48] Evidence gathered by the Commission relates to: contemporary documents from both Google and other market players; very significant quantities of real-world data; experiments and surveys; analysing in particular the impact of visibility in search results on consumer behaviour and click-through rates; financial and traffic data which outline the commercial importance of visibility in Google's search results

The US antitrust authorities, either the Federal Trade Commission (FTC) or the US Department of Justice (DoJ) had a limited scrutiny of US digital leaders over the last twenty years. The action against *Microsoft*, initiated in 1998 and closed in 2002, has been the only antitrust action by the DoJ against a global US digital leader. The initial proceedings concerned the monopolisation of Windows OS, the tying of Windows to Internet Explorer in order to leverage monopoly in the market for web browsers, and the maintaining of monopoly through a range of unfair commercial practices[49]. In its final judgement, the Court of Appeal stated in 2002 that the Windows monopoly position in the market for OS was not acquired by illegal means and that the tying of the dominant Windows OS with Internet Explorer had no clear anticompetitive effects. The Court of Appeal however ruled that *Microsoft* maintained its monopoly position through exclusionary and restrictive practices that have hindered the ability alternative products to compete[50]. The antitrust case was closed after *Microsoft* committed to remove technical and commercial restrictions imposed on direct competitors, device manufacturers and software developers as well[51].

The FTC has also launched only one proceeding against anticompetitive practices from the US digital leaders. Those practices entailed interoperability and multi-homing restrictions. *Google* was suspected to having attempted to prevent competitors from using some of its standard-essential patents[52]. The FTC was also concerned that *Google* attempted to restrict the use of its online search advertising platform, "*AdWords*", and prevented advertisers to simultaneously advertise on *Google* and competing Search engines. In addition, *Google* was alleged to having engaged in "search bias" practices though manipulating its search algorithm and introducing software ("*Universal Search*") able to push its own content. The FTC rapidly closed proceedings, after *Google* committed to licence its standard-essential patents, to remove contractual restrictions on "*AdWords*" usage by advertisers, and to refrain from misappropriating online content from other websites[53]. The FTC Commissioner M. K. Ohlhausen (2013) observed that no theory of harm would justify to impose interoperability remedies on "*AdWords*" Application Programming Interface ("API"), as their terms and conditions do not increase the costs for competing search platforms and do not oblige advertisers to provide their business to *Google* rather than alternative search engines. In addition, the fast growth of applications to access rival's websites or services rules out any possible harm to competition or to consumers from "search bias". [54]

Moreover, the FTC concluded that the modifications of its Search algorithm and even those modifications that may have harmed individual competitors could be justified as innovations improving *Google*'s products and user experience[55]. Interestingly, the FTC has considered that demotions experienced by some websites in the rankings of *Google*'s search results were rather due to algorithm changes aimed at improving the overall quality of *Google*'s search results than the consequence of an unfair manipulation. Such changes had the effect of improving user experience, as stated by FTC Commissioner Jon Leibowitz (2013)[56]. It appears that the US antitrust approach on digital monopolies' commercial activities differs from the views of the European

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and the impact of being demoted; an extensive market investigation of customers and competitors in the markets concerned (the Commission addressed questionnaires to several hundred companies). *See* http://europa.eu/rapid/press-release_IP-17-1784_en.htm.

[49] The practices under investigation from the US authorities of competition are listed in the 1999 DoJ "Finding of Facts" and in the 2000 Order from the District Court for the District of Columbia. They can be found at: https://www.justice.gov/atr/us-v-*microsoft*-courts-findings-fact ; http://law.justia.com/cases/federal/district-courts/FSupp2/97/59/2339529/

[50] The November 12, 2002 final judgment from the US District Court for the District of Columbia in the case U.S. v. *Microsoft Corporation* [Browser and Middleware]: https://www.justice.gov/atr/case-document/final-judgment-133

[51] *Microsoft* committed to not retaliate against manufacturers and software developers which use, develop or promote competing applications and services, and to not restrict by agreement such possibilities. The review of the final judgment of the US v. *Microsoft* case is found on the US Department of Justice website: https://www.justice.gov/atr/case-document/review-final-judgments-united-states-and-new-york-group

[52]The FTC initiated proceedings against *Google* in 2013, on the grounds that *Google* might have breached its commitment to licence its standard essential patents (from Motorola Mobility's portfolio) on fair, reasonable and non-discriminatory (FRAND) terms. *Google* was suspected to having attempted to prevent companies that needed to use those standard-essential patents in their devices and were willing to licence them on FRAND terms: https://www.ftc.gov/sites/default/files/documents/cases/2013/01/130103googlemotorolacmpt.pdf

[53]The FTC notification of the closing of proceedings against *Google* was released on January 3, 2013. It provides a description of *Google*'s commitment to provide competitors with access to its standard-essential patents, to give advertisers greater flexibility to use alternative search engines allowing them to manage advertising campaigns on both AdWords and rival platforms, and to refrain from misappropriating online content from vertical third-party websites for use in its own vertical offerings appearing on its Covered Webpages: https://www.ftc.gov/news-events/press-releases/2013/01/google-agrees-change-its-business-practices-resolve-ftc. The letter addressed by *Google* to the Commission provides information on its last two commitments (AdWords and Covered Webpages): https://www.ftc.gov/system/files/documents/closing_letters/google-inc./130103googleletterchairmanleibowitz.pdf

[54] See The statement of FTC Commissioner M. K. Ohlhausen evidences the relevance of FTC decision to close the antitrust investigations on search:https://www.ftc.gov/sites/default/files/documents/public_statements/statement-commissioner-maureen-ohlhausen/130103googlesearchohlhausenstmt.pdf

[55] The January 2013 *Statement of the Federal Trade Commission Regarding Google's Search Practices In the Matter of Google Inc*. has provided the conclusion that the practices of *Google* in the field of Search services cannot be considered demonstrably anticompetitive: https://www.ftc.gov/system/files/documents/public_statements/295971/130103googlesearchstmtofcomm.pdf

[56] The FTC Commissioner Jon Leibowitz press conference of January 2013 on the *Google*'s settlement explains the FTC decision on the basis of the practices from *Google* and *Google*'s competitors, and on the scope of American antitrust law and policy. on the practice of altering search results, Jon Leibowitz considers that "*Google's search engine rivals engaged in many of the same product design choices that Google did, suggesting that this practice benefits consumers*", and recalled that the focus of American law is on "*protecting competition, not competitors*". See https://www.ftc.gov/sites/default/files/documents/public_statements/opening-remarks-federal-trade-commission-chairman-jon-leibowitz-prepared-delivery/130103googleleibowitzremarks.pdf

competition authorities. For example, the FTC has closed its inquiry on *Google* Search whereas the European Commission has intensified its investigations by serving additional Statements of Objections. According to the FTC Commissioner M.K. Ohlhausen (2013), the views of the FTC and the European Commission on the topical case of *Google* Search reveals the different approaches of EU and US authorities on antitrust[57]. This difference between US and EU competition authorities towards US digital giants cannot be attributed to EU protectionism, because EU competition authorities apply the same policy towards EU firms than towards US firms.

2. EU authorities targeted actions against specific undue practices

Although the anticompetitive effects of tying and of restricting interoperability can be unintended and can result from strategies aimed at maximising efficiency, other practices such as imposing unfair contract terms have the primary intention to distort competition. In two-sided digital markets, such restrictive practices occur when the dominant platform owner impose multiple exclusive agreements to the profit-making side in order to prevent users from contracting with competing platforms owners[58]. For example, in 2013, the European Commission reached preliminary conclusions that *Google* might have imposed unfair contractual practices to online advertising publishers[59]. In the following Statement of Objections of July 2016, the Commission reaffirmed and reinforce its view that such contractual practices have impaired competition[60]. The Commission's sanction imposed on *Google* in June 2017, on the motive that *Google* has leveraged its dominant position in the market for Search to favour its own services over those of competitors also relates to its action against strategies specifically designed to distort competition. The European Commission has also opened an inquiry on a breach of procedural rules by *Facebook* during the investigation into its acquisition of the social networking and messaging application *WhatsApp*[61]. The Commission has alleged that *Facebook* provided incorrect or misleading information concerning its ability to establish automated matching between the two companies' user accounts. The Commission has also recently concluded that *Apple* has been illegally granted undue tax benefits by the State of Ireland, in breach of European State aid rules[62].

In addition, the German competition authority has recently opened an inquiry on Facebook for collecting and processing its users' personal data from various sources including own Facebook platforms WhatsApp and Instagram, without providing them with sufficiently accurate information on the ways their data would be used[63]. According to the German authority's rationale, Facebook has abused its dominant position on the market for social media by rendering users' access to its platforms of services conditional on collecting and exploiting their personal data. In this case, Facebook as a platform of platforms may have leveraged its dominant position to impose users' conditions not in line with the standards of personal data protection and consumer rights.

Besides targeted actions against anti-competitive behaviours from dominant on-line platforms, the Commission is also willing to address specific concerns attached to platform-to-business relationships in general, notably by mandating transparency of digital platforms' business practices in particular by disclosing commercial interests which may distort rankings or recommendations provided by platforms[64].

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[57] The statement of FTC commissioner M.K. Ohlhausen which has been released in September *2016 US-EU Convergence: Can We bridge the Atlantic?* points at the specific differences between the European and the American competition authorities' doctrine and practice of antitrust. According to the FTC commissioner's statement, the views of the FTC and the European Commission on the topical case of *Google* Search "*reveal differences in how European and American antitrust enforcers approaches issues of dominance in the new economy*" https://www.ftc.gov/system/files/documents/public_statements/985133/ohlhausen_dinner_speech_09192016.pdf

[58] *See* Nicolas Colin, Augustin Landier, Pierre Mohenc & Anne Perrot (2015), *Economie Numérique* Les notes du conseil d'analyse économique, n° 26. http://www.cae-eco.fr/IMG/pdf/cae-note026.pdf.

[59] In the Preliminary Assessment, the Commission's concerns about unfair contractual practices were related to "*Exclusivity agreements with publishers for the provision of online search advertising on their web sites*" and "*Contractual restrictions on the portability and management of online search advertising campaigns across Google's AdWords and competing platforms*". The Commission notably pointed at "*contractual restrictions on the transferability of online search advertising campaigns to rival search advertising platforms*": http://europa.eu/rapid/press-release_MEMO-13-383_en.htm

[60] In the July 2016 Statement of Objections, the Commission indicates that "*in the context of its antitrust proceedings, Google has recently decided to change the conditions in its AdSense contracts with Direct Partners to give them more freedom to display competing search ads*". However, the Commission intends to closely monitor these changes in *Google*'s practices to assess how they will impact the market": http://europa.eu/rapid/press-release_IP-16-2532_en.htm

[61] The European Commission's Statement of Objections' indicates that, contrary to *Facebook*'s affirmations during the merger review, the technical possibility of automatically matching *Facebook* users' IDs with WhatsApp users' IDs already existed at the time of the takeover. The preliminary view of the Commission is that *Facebook* might have negligently or intentionally provided incorrect information to the Commission concerning the real ability of platforms to match users' profiles. *See* http://europa.eu/rapid/press-release_IP-16-4473_en.htm

[62] The Commission has stated that the selective tax treatment in Ireland has enabled Apple to avoid taxation on "*almost all profits generated by sales of Apple products in the entire EU Single Market*", providing a "*significant advantage over other businesses that are subject to the same national taxation rules*". *See* http://europa.eu/rapid/press-release_IP-16-2923_en.htm.

[63] http://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2017/19_12_2017_Facebook.html?nn=3599398

[64] A draft proposal for a Regulation on promoting fairness in online intermediated trade by the European Commission has leaked in December 2017. The Commission should adopt its proposal of Regulation in April 2018.

3. Conclusion: Unlike the European competition authorities, the action of the US antitrust agencies are focused on practices with anticompetitive effects

From the analysis of European and American antitrust cases against the dominant digital platforms, it appears that the US authorities have tended to focus on a limited range of conducts with anticompetitive effects rather than to increase the scope for scrutiny. Anticompetitive conducts which have been redressed in the US relate to restrictions by agreements, retaliation, and refusal to licence on fair and non-discriminatory terms. By contrast, the European authorities have also worked to redress pro-competitive practices that might have unintended anticompetitive effects in the market, leading to a more intense antitrust activity. The antitrust action of European authorities against the dominant US digital platforms can be viewed as a direct application of their doctrine on the exercise of market power. The European practice of antitrust is rooted in a theoretical approach of competition policy and, as a result, it applies equally to all types of stakeholders which have monopoly power at the level of the European internal market, irrespective of their country of origin. The practices of tying, leveraging of monopoly power and restriction in interoperability have been sanctioned in the EU while they have not been deemed anticompetitive in the US. In addition, commitments of dominant platforms to refrain from restricting competition have led to the closing of all antitrust cases in the US, whereas in Europe, the antitrust agencies have imposed fines and served statement of objections to tighten scrutiny of digital monopoly platforms. However, targeted interventions against specific questionable behaviours (e.g. relating to unfair contracts, provision of incorrect or misleading information, e.g. when a dominant search engine artificially favours an in-house shopping service at the expense of better ones, preferential tax treatment, …) are fully justified and do not raise the same concerns.

B. The US approach on the exercise of market power is more conducive to the growth of digital services than the European doctrine

The economic practices of the dominant digital platforms which consist in tying products with network effects as well as restricting their interoperability, as discussed in the first part, may primarily have efficiency grounds and no anticompetitive effects. Under the market characteristics analysed in the first part, these practices might however foreclose competitors. US competition policy towards major dominant platforms appears grounded on the former consideration, whereas EU authorities put the emphasis on the latter effects. US approach appears more appropriate to support growth and welfare in a dynamic digitalised economy.

1. The US antitrust regard platforms' practices as generally compatible with effective competition whereas EU competition authorities attempt to redress their foreclosing effects

The tying of the basic access to the platform with a free complementary product, the related leveraging of monopoly power and the restriction in interoperability of products or components does not raise a comparable level of scrutiny from antitrust agencies in the US and in Europe. While such practices have been under tight scrutiny in Europe over the last fifteen years, the US antitrust agencies have rather targeted specific unlawful practices with actual anticompetitive effects. The American competition authorities have tended, under the influence of the Chicago School of thoughts, to focus on the actual anticompetitive effects of these economic practices, according to the "*rule of reason*". By contrast, in the European Union, the competition authorities scrutinise and sanction dominant firms on the basis of intents that might result in anticompetitive effects, rather than on the basis of their related actual effects[65].

Moreover, the European competition authorities consider that dominant firms are liable for maintaining effective competition in their own market, which implies that the effects of their behaviour on their competitors and consumers are not necessary to be assessed in order to establish whether their harm competition. Such liability has the effect of limiting the strategic autonomy of dominant firms, hence, their ability to invest in innovation in order to acquire and exercise a market power.

Recently, however, a decision of the Court of Justice of the European Union indicates that the European competition authorities are willing to renew their approach on the dominant firms' liability. In September 2017, the Court of Justice set aside a 2014 judgment of the General Court which had upheld a €1.06 billion fine on the US microchip manufacturer Intel[66]. The fine had been imposed to Intel in 2009 for having abused its dominant position on the worldwide market for processors through granting exclusive rebates to its own clients, among the major computer manufacturers. The 2014 judgment was overturn to the grounds that the General Court, considering that exclusive rebates are anti-competitive per se, failed to rebut the economic arguments provided by Intel, which intended to show that those exclusive rebates could not have foreclosed a competitor as efficient as Intel on the contestable market, and therefore could not have a detrimental effect on competition. This

[65] *See* Fréderic Marty, *Politiques européennes de concurrence et économie sociale de marché*, Document de travail OFCE N 2010-30 (2010).
[66] https://curia.europa.eu/jcms/upload/docs/application/pdf/2017-09/cp170090en.pdf

decision alone is however not sufficient to state whether the effect-based approach will become the standard for the European authorities in terms of abuse of dominant position.

The US antitrust action, by contrast, does not consist in limiting the scope of dominant firms' practices and strategies. In the view of US Courts and competition agencies, the dominant market player is not supposed to maintain its close competitors in the market, but it is rather expected to gain or maintain a competitive edge over rivals in the market. According to this approach, the exercise of monopoly power is viewed by the competition authorities as both a necessary incentive to invest and as a fair return on investment[67]. As a matter of fact, the US competition authorities consider that dominant firms should not be subject to sanctions for exercising their monopoly power. On the contrary, from the traditional point of view of European competition law, strategies and actions through which market power is exercised are more likely to be qualified as anticompetitive. The European antitrust agencies generally ban the exercise of market power on the grounds that only competitive market structures are efficient and welfare-enhancing[68].

Overall, the scope of US antitrust action is limited to economic strategies and practices aimed at gaining or maintaining monopoly power through illegal means, while the scope of European antitrust action also include the scrutiny of anticompetitive intents and of the exercise of market power. As a consequence, the practices of digital leaders aimed at exploiting the network effects of their Two-Sided Platforms tend to be considered as anticompetitive *per se* in the European Union, while they are viewed as sources of economic efficiencies in the US. As the antitrust cases studied in the previous section would suggest, the US approach on the exercise of market power is more oriented towards the preservation of incentives to innovate. Overall the US approach on antirust appears to have been more effective in supporting the growth of digital markets and innovative sectors in general[69].

2. EU focus on static competition model might prevent EU to compete with the US in a global digital ecosystem

Overall, the European and American authorities differ in their doctrine of competition policy and their antitrust practices, notably as regard the exercise of market power and the behaviour of dominant market players. The European competition authorities have so far referred to a traditional static model of competition whereas a more innovation-oriented, dynamic competition model prevails at the level US antitrust agencies. The competition authorities in Europe consider that the exercise of market power is a source of inefficiency and that it should be removed on the grounds that it harms effective competition. Such doctrine, which relies on a static appreciation of the market structure, can induce the European competition agencies to sanction strategies and practices which have efficiency grounds and have no anticompetitive intent. This static approach on antitrust could deprive the European economy from potential efficiency gains, in particular in sectors characterised by a fast rate of technological change and significant network effects. By contrast, the US authorities, in line with the Chicago School of antitrust analysis, have worked to maintain incentives to engage in investment in innovation, by applying a dynamic analysis of digital markets, where economic efficiency standards prevail over effective competition in static market structure as an objective *per se*. Such a dynamic model of competition analysis seems relevant for guiding the antitrust analysis at the level of digital markets, and appears more prone to support the development of digital industries and the rate of aggregate productivity growth as well[70].

With the dynamic nature of digital services such as search engines and social networks, which are highly dependent on the strength of technological progress, competition authorities need to redefine their analysis of the competitive process. This upgrade requires a shift from the static view of competitive intensity based on market shares towards a dynamic assessment of competition in such fast-moving industries. Such dynamic approach would imply to consider the strength of potential competition faced by incumbent platform and the threat of innovators' entry as a measure of competition intensity. Market power would thus be more effectively appreciated on the basis of potential competition than on the basis of the level of market shares[71] . Henceforth the digital value chains form a globalised ecosystem of interrelated and competing markets. As a result, competition policy discrepancies between the European Union and the US distort the competitive process among European and American digital providers in the global market, which are not subject to a same antitrust scrutiny in their respective home countries. Such discrepancy impairs the efficiency of the competitive process at a global scale. A convergence in antitrust doctrines and actions would provide a more balanced competition between the European and the US providers in the global digital market. This convergence does not imply that the European

[67] *See* Frédéric Marty & Julien Pillot, *Les politiques de concurrence européenne et américaine face aux remises de fidélité accordées par une entreprise dominante L'affaire Intel*, Document de travail OFCE N 2009-26 (2009).
[68] *See* Frédéric Marty & Julien Pillot, *Divergences transatlantiques en matière d'application de la théorie des facilités essentielles aux actifs immatériels*, 129-130 REVUE D'ECONOMIE INDUSTRIELLE, 277 (2010).
[69] *See* Carl Shapiro, *Competition and Innovation: Did Arrow Hit the Bull's Eye?* in: J. Lerner & S. Stern (eds), The Rate and Direction of Inventive Activity Revisited. NBER, 361-404, (2011).
[70] See Stephane Ciriani & Marc Lebourges, *The role of market power in economic growth: an analysis of the differences between EU and US competition policy theory, practice and outcomes*, 5(1) EUROPEAN JOURNAL OF GOVERNMENT AND ECONOMICS 5 (2016).
[71] *See* Inge Graef, *Stretching EU competition law tools for search engines and social networks*, 4(3) INTERNET POLICY REVIEW, (2015).

authorities should strive at tackling the monopoly power of the US platforms on the grounds that dominance is *per se* harmful to welfare. The European authorities should rather move towards a more innovation-oriented doctrine and practice of antitrust, best suited for the developing of a local productive base. This convergence in competition policy doctrine and practice would avoid undermining the benefits that the digital markets provide in terms of efficiency and social welfare. It should not prevent European authorities to continue to intervene against unfair contractual clauses, the provision of misleading information in the context of merger control, and biased taxation practices which distort competition.

C. Coordination mechanisms could extend the benefits from platforms while avoiding the drawbacks from monopolisation of closed proprietary platforms

As discussed in the first part, the market dynamics of monopoly platforms can lead to negative welfare outcomes if such safeguards as multi-homing or low switching costs are not present. Overall, the welfare effects remain ambiguous as they result from the balance between the efficiency gains from tying, market power leveraging and interoperability restriction, and their related foreclosing effects. The economic model of the digital platforms is efficient provided that platforms are able to internalise the indirect network effects through subsidising the free end-user side. The magnitude of efficiencies increases with the degree of platform's dominance. As a result, monopoly ends-up being the most efficient market structure. However, such market structures produce uncertain welfare outcomes. Preserving efficiency gains without monopolising the market appears a challenging prospect, as it would still require maintaining the ability of firms to internalise the whole network effects from their interoperable platforms.

Recent theoretical contribution explains how a cooperative arrangement among firms, in the form of agreement on price caps for their various goods, services and licences do not hinder competition and improve consumer welfare while firms' profits can either increase or remain unchanged. The efficiency and welfare benefits of cooperation between competing market players had already been investigated in the field of patent pools[72]. But the result applies to a wider range of commercial cooperation[73]. As a general result, it appears that price-caps agreement between competing firms always benefit welfare, and, when products are complementary, they encourage entry, product differentiation and improves consumer welfare. This general result applies in particular to markets with direct network effects, where coordination on price caps appears as an efficient strategy to bootstrap the initial global demand without hindering competition. However, a theoretical analysis of a welfare enhancing mechanism of coordination in markets with indirect network effects has yet to be completed.

Nevertheless, based on these results from theoretical microeconomics, it is possible to suggest that in digital markets characterised by large network effects which would naturally lead to monopolistic market structures, allowing welfare enhancing forms of coordination could maintain internalisation of externalities and at the same time safeguard competition, thereby increasing efficiencies. Such cooperation would be a valid substitute for monopoly market structure. A mechanism based on specific welfare-enhancing forms of price coordination could allow a set of firms to compete on interoperable platforms while capturing efficiencies without monopolising the market. For instance, allowing independent competing firms to engage in coordination mechanism through agreements on price ceilings could improve efficiency and consumer welfare in presence of direct network effects. Competition policy could also support the emergence of two sided platform pricing strategies within competitive markets where independent firms provide interoperable services, if they authorise welfare enhancing forms of price coordination between those independent firms. Then, installed dominant platforms would not retain the monopoly of the ability to internalise externalities.

Conclusion of part III: European policy should be inspired by US antitrust and support welfare enhancing forms of price cooperation to trigger the development of efficient competitors to GAFA

The tying of products with network effects, the related leveraging of monopoly power, their restriction on interoperability have led the US digital leaders to acquire, exercise and maintain their monopoly power over time. These practices, which have worked to build their global leadership, are regarded as efficiency drivers by the US antitrust agencies. By contrast, they have been under a tighter scrutiny and have been sanctioned to a certain extend by the European antitrust agencies which consider that they have foreclosure effects, and as such they need to be redressed. Modern economic analysis rather supports US views in this respect, which implies that EU competition policy should move towards US antitrust doctrine in order to help fostering innovation and economic growth. Competition policy should also support welfare enhancing forms of price coordination in competitive markets, to allow them to behave globally as efficient two sided platforms.

[72] *See* Josh Lerner & Jean Tirole, *Efficient Patent Pools*, 94(3) AMERICAN ECONOMIC REVIEW, 691 (2004).
[73] *See* Patrick Rey & Jean Tirole, *Price Caps as Welfare-Enhancing Coopetition*, Working Paper N°TSE-439, (2013) revised (2017).

IV. CONCLUSION

The efficiency of *GAFA*'s economic model relates to rational exploitation of indirect and direct network effects which are further empowered by tying and restriction of compatibility. These practices have made their monopoly power enduring. They have both efficiency grounds and foreclosing effects, and an overall ambiguous impact on innovation, efficiency and welfare. The economic literature does not support a systematic regulation intervention against these practices, but allows recommending targeted actions against their specific anticompetitive or unfair commercial practices.

The convergence of EU doctrine and practice on antitrust towards the US approach, more prone to support innovation and economic efficiency, would work to build a competitive European digital industry. In addition to this realigning of competition policy, a more balanced approach to digital sector regulation, an efficient enforcement of taxation of digital products based on where their value comes from, a taxation policy supporting the development of digital activities are also necessary in order to build a competitive European digital ecosystem, with actors capable to compete on a global scale.

A promising way forward could be a competition policy that would support welfare enhancing forms of price cooperation between competitors in digital markets with notable network effects. Such cooperation could allow interoperable, compatible and open digital ecosystems to behave as platforms, thereby allowing them to internalise network effects, which could raise their competitiveness *vis-à-vis* large scale, dominant non-compatible or closed digital platforms.

This paper has concentrated on discussing a European competition policy which would be conducive to the development of a globally competitive EU digital industry. Aside from competition policy, the building of a competitive digital ecosystem in the EU, with actors able to compete on a global scale with the digital leaders also require reforms of tax policies and of digital sector regulation. Tax policies in the digital sector should align the economic conditions applying to all businesses in the European internal markets, and provide incentives to invest locally in the development of digital activities[74]. In addition, a regulatory framework providing equivalent rules to all the digital stakeholders operating in Europe (providing substitutable digital services) would contribute to tackle distortions in the competitive global landscape[75].

[74] Tackling tax asymmetries in the global digital sector would contribute to a fair and equitable fiscal regime applying equally to all digital providers in Europe. According to this principle, the OECD acknowledged in the 2014 "Base Erosion and Profit Shifting" project the need to align the tax regimes within the world Internet ecosystem. The EC launched in 2015 a review of its corporate tax system, with the scope of tackling tax avoidance, by re-establishing the link between taxation and the geographical location of economic activity. In the US, the "Permanent Internet Tax Freedom Act" adopted in 2015 permanently bans local and federal governments from taxing Internet access and imposing discriminatory taxes on Internet usage and from raising various taxes on ecommerce and traded digital goods and services. It permanently extends the "Internet Tax Freedom Act" voted in 1997 in order to safeguard the technological and economic development of the Internet for a limited period. The EC should consider similar tax incentives to foster investment in the digital industries.

[75] *See* Anne-Marie Allouet, Sylvie Le Franc, Marie-Noemie Marques, & Luisa Rossi, *Achieving a Level Playing Field between the Players of the Internet Value Chain*, 1(93) COMMUNICATIONS & STRATEGIES 99 (2014); Luisa Rossi, *Proposal for the reform of the regulation of digital services*, RSCAS 2015/49 EUI Working Papers (2015). A regulatory framework ensuring a fair competition on the merits in the European digital ecosystem necessitates the provision of horizontal rules applying to all the online services available from all types of providers, from the telecommunication operators to the digital platforms.