

Zero Price, Zero Competition:
How Marketization Fixes Anticompetitive Tying in Monetized Markets*

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Abstract

This paper expands on an idea recently voiced by neo-Brandeisians and formally modelled by economists in the past two decades – namely, that the Chicago School’s arguments for the harmless and efficiency generating nature of vertical integration do not apply on zero-priced monetized markets. We build on these findings by developing a non-formal, incentive-based theoretical model that shows how the non-interventionist Chicago School approach leads towards irreversible market failure. We propose marketization as a solution to this conundrum – a structure whereby consumer activity on zero-priced markets and its subsequent monetization are no longer in the hands of the same company. Instead, marketization introduces competition by allowing the consumer to choose how and by whom to be monetized. Lastly, we proceed to examining the potential for eventual policy implementation of marketization through the recent Commission proposal for a Digital Markets Act.

Keywords: antitrust (competition policy), digital markets, marketization, structural remedies, vertical integration

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I. Introduction

This paper expands on the idea voiced by neo-Brandeisians that the Chicago School's arguments for the harmless and efficiency generating nature of vertical integration do not apply in the context of zero-priced monetized markets. The Chicago School's arguments took root in the 1970s, and have been a mainstay of competition regulation in the EU and in the US ever since (Kovacic 2007, Bartalevich 2016). However, IO economists have already started doubting their applicability to digital markets in the early 2000s (Rochet 2003). Since then, formal economic models showing anti-competitive leveraging and the market tipping potential of digital markets have mushroomed (Eisenmann 2011, Argenton 2012). Inspired by their findings, we develop a non-formal, incentive-based theoretical model that shows how the non-interventionist approach, which the Chicago School encourages, leads towards irreversible market failure and harms consumer welfare, especially since zero-price monetization models are highly prevalent in (digital) markets today.

Monetization is a useful innovation, which grants consumers access to goods and services free of charge, with revenue being generated through an auxiliary product such as targeted advertising. However, by focusing on incentives, we describe how vertical integration of a firm's core product(s) with its monetizing product creates mechanisms that, among other harms, make markets prone to tipping and encourage dominant firms to use below-cost pricing in order to enter adjacent markets and expand the size of their profitable monetizing market. In this sense, we confirm the findings of formal economic models by a different route: the development of a high-level, incentive-based framework in Sections II and III. We will then apply the said framework to zero-price vertically integrated platforms (Section IV), and propose a new regulatory concept, *marketization*, as a remedy to previously identified core concerns.

Using this same framework, in Section V we proceed to commenting on the EU's recently released proposal for a Digital Markets Act (DMA), as it has a direct bearing on the future regulatory context for zero-price vertically integrated platforms – a future that seems to be heavily informed by competition policy reasoning and principles.

II. The effect of monetization on market dynamics in the context of vertical integration

Before examining the effects of monetization on markets, we must first discuss the basic conditions and incentives under which markets operate, so that we can then understand how they change in the context of monetization.

1. Markets, incentives, and vertical integration

Markets are useful because they function as a mechanism for assigning value to products and services. They do this in two ways: first, by granting market participants sovereignty over their own actions within the market, and second, through their capacity to mediate between the opposing interests of producers and consumers. In terms of incentives, producers wish to sell their goods and services in order to make as much profit as possible, while consumers aim to satisfy their desire to consume these goods and services while minimizing their own financial expenditure (Bar&Sandvig 2000).

The first property, sovereignty, dictates that each participant in the market must be able to choose with whom they transact, and, crucially, must be able to seek out alternatives if a given transaction is unattractive. This enables participants to avoid interactions with unreasonable partners; this criterion forces all market players to find compromises and prevents the interests of

one participant from overruling another. Thus, the compromises that result constitute the actual value assignment function of the market.

The second property, mediation, relies on the assumption that all participants are rational, and will only commit to a transaction if it has a net positive outcome for them. In broad terms, this means both that producers require the sale price of a product to exceed its production costs, and that consumers will only consume the product(s) if their subjective assessment of the value of the product exceeds its sale price.

Another function of markets inheres in their ability to allow firms to specialize in the production of a given product or service, which generates economies of scale or scope (Smith 1776). These economies make the whole system more efficient. As such, most markets can be seen to have multiple layers, where firms at each layer take a number of “inputs” and produce a product as an “output.” The interactions between firms where one firm’s outputs are another firm’s inputs (i.e. between producers and consumers at different layers of the market) are said to be “vertical.”

The classical argument to understand the effects of vertical arrangements on competition is similar to the conditions described above; the argument asserts that competitive outcomes are maintained by virtue of the upstream producer’s interests being opposed to those of the downstream consumer and vice versa. This means that, so long as one of these participants does not possess market power (for example, the upstream producer is a monopolist or the downstream consumer is a monopsonist),¹ no individual firm will be able to influence market prices.²

On the other hand, vertical integration occurs when a single firm spans multiple layers of the market; for example, the supply chain of a company may also be owned by that company, as is the case when a producer and distributor have merged into a single entity. In the late 1970s,

Chicago School scholars extended the above logic for vertical agreements to show that vertical integration was also almost always pro-competitive.

Their view hinged on three arguments, as explained by Khan (Khan 2019). First is the so-called “*single monopoly profit*” argument. This argument goes that consumers will examine the total cost of the whole product and will not pay more overall, even if there is a discount at one level of the market. For example, a rational consumer would not purchase a car for a steeply-discounted price if the car required a special fuel that was only produced by the car maker and was far more expensive than other fuels. In this case, rational consumers would look at the total cost of their consumption, and realize that the extra cost of the fuel would outweigh the discounted upfront cost of the car.

Second, Khan outlines: “that an integrated firm would be able to foreclose rivals only to the degree that the firm had generated cost savings, outdoing less efficient competitors—an outcome that antitrust should encourage.” This precept implies that companies which are able to integrate and outcompete non-integrated firms will be able to do so only if they generate enough efficiencies through integration as to out-compete rival firms on price. Third and finally, Khan describes the argument wherein “vertical mergers would invariably generate significant efficiencies.” Essentially, this means that transaction costs are reduced when there are fewer firms involved in the creation of products.

2. Monetized markets

This paper rebuts the Chicago School’s arguments for the pro-competitive outcomes of vertical integration in the context of monetized digital markets. In these markets, also known as zero-price markets, consumers pay nothing in exchange for access to products and services, which has caused

them to be seen in a positive light from the perspective of antitrust focused on the consumer welfare standard.³ By contrast, this section describes how the combination of vertical integration and monetization makes markets liable to tipping, and creates profit maximizing incentives, which dictate that firms should continually and destructively expand into new lines of business.

In order to analyze the incentive structures and dynamics of such arrangements, we define a theoretical model to explain what monetized markets are, and understand the incentive structure of actors who participate in them. Monetized markets are often thought of as being multi-sided, where participants such as advertisers on one side of the market (termed C_m) “pay for” the consumption of participants on the other side of the market such as social network users (termed C_p), who are often said to somehow “pay” through their usage of product P (Eisenmann et al. 2006, Shelanski 2012). This view is explained diagrammatically in Figure 1, left panel.

This paper proposes a more focused model. Rather than examining all two-sided markets, we examine a narrower subset, where C_p 's usage of an existing product enables the creation of an auxiliary product sold to C_m , a process we describe as “*monetization*.”⁴ The sale of this second product to C_m generates a profit, which is used to subsidize C_p 's usage of P . Thus, C_p 's interactions with P are described as “monetized.”

Therefore, our model considers monetized markets to have two distinct layers. First, we encounter a product layer “ P ,” consumed by C_p , which is what is ordinarily thought of as “the product” (such as a social network). Second, there exists a monetization layer “ M ” through which another set of consumers, C_m are able to purchase the products of monetization (such as an advertising network).

We refer to the product and monetization layers of the market as P and M respectively, and the specific products sold by the integrated firm as P_i and M_i . To summarize with the above

terminology, C_p uses P_i free of charge, but their interactions with P_i are monetized through the creation of a new product M_i . The new product exists in market layer M , which is sold to C_m at a profit, which (in turn) funds C_p 's usage of P_i . This is illustrated in Figure 1, right panel, and the actors involved are further described in Table 1.

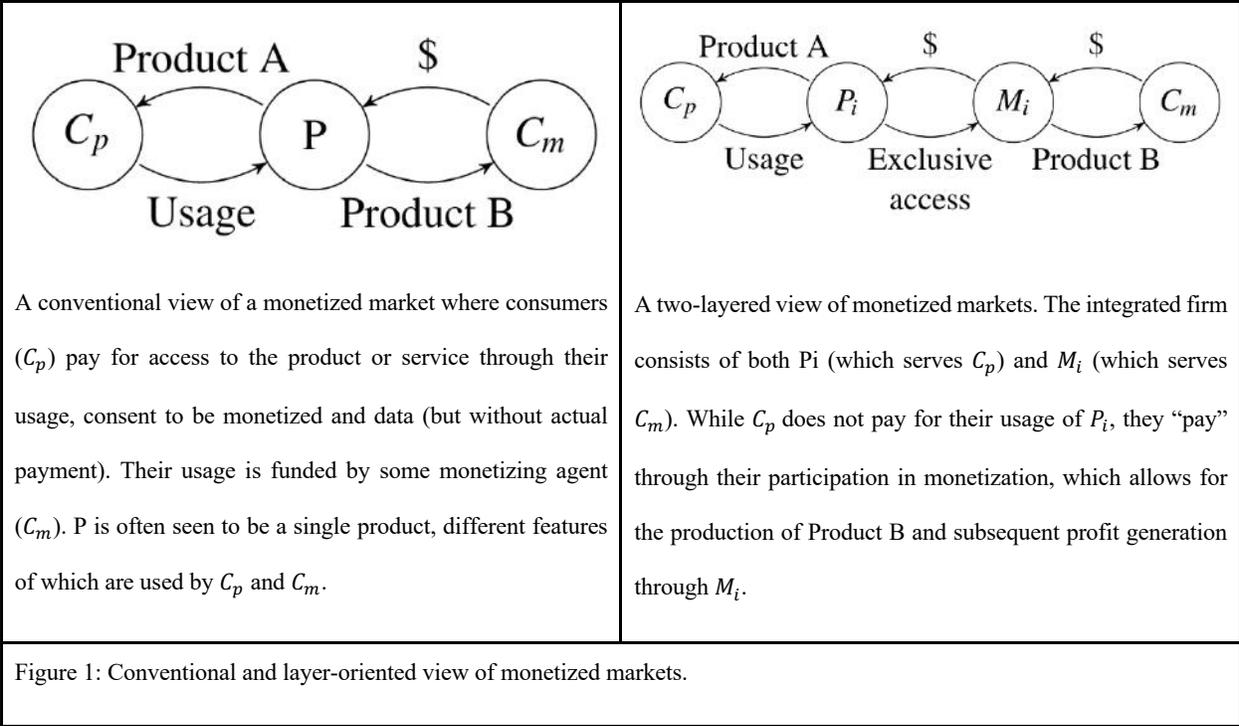


Figure 1: Conventional and layer-oriented view of monetized markets.

Actor	Description	Example
P	The product consumed by end users	Firm producing P is denoted as P_i (e.g. Facebook’s social network) which would operate in the market for P (e.g. the social network market)
C_p	The end consumer or end user, mostly natural persons	Monetized end consumer, consumer of P (e.g. the reader)
M	The product created as a byproduct of C_p ’s consumption	Firm producing M is denoted as M_i (e.g. Facebook’s ad networks) which would operate in the market for M (e.g. the display advertising market).
C_m	Consumers of M , mostly legal persons	An individual firm, consumer of M (e.g. firm purchasing advertising)

Table 1: Actors on monetized markets

In most monetized markets today, layers P and M are vertically integrated, meaning that P_i and M_i are operating within the same firm and P and M are marketed as the same or very related products, just to different sets of customers.⁵ Crucially, this means that P_i and M_i are generally tied together. As noted by the UK's Competition and Markets Authority, resellers may intermediate between C_m and M . Nonetheless, all such intermediation must eventually go through M_i , which holds a monopoly over products produced as a result of C_p 's interactions with P_i . As a consequence, C_p is unable to consume P_i by any other means than being subject to monetization by M_i , and the only way that C_m can consume products created from C_p 's interactions with P_i is through the integrated product M_i . This is a form of vertical foreclosure (Rey&Tirole 2007). It is important to note that despite their tied nature in most monetized markets today, both P and M are hereby modelled as standalone products in their own right.

The most widely known manifestation of monetized markets to which this model can be applied occurs in ad-funded digital business models, where consumers consent to being monetized through the harvesting of their personal data and subsequent exposure to targeted advertising. These are the so-called "zero-price" platform markets that rely on monetization through advertising and will be the key focus point driving the analysis and the policy and enforcement proposals of this paper. However, observe that our model of monetization extends beyond this particular dynamic to any context where the interactions of C_p with products in market layer P allow for the creation of another product in market layer M which could allow C_p to pay a discounted cost for their consumption at P .⁶

This assertion stands because monetization, in any form, distorts the incentives of market participants.

3. The effect of monetization on consumer incentives

Monetization is a business innovation that has made products easier to access and lowered their upfront cost for consumers; these are outcomes widely acknowledged by competition scholars and regulators alike (Furman et al. 2019, Schweitzer&Welker 2019, Petit 2020). Even so, it is also the case that monetization affects the functioning and incentive structures within markets, which can alter their function in ways that are relevant to competition law and policy.

The principal way in which monetization can distort markets, and from which all subsequent harms follow, is by breaking their value-assignment function as a result of providing access to P at no cost. This removes the cost-minimizing incentive of consumers on the product side of the market (C_p) since the cost of consumption is always zero.⁷

As outlined in Section 2.1, customers are incentivized to transact whenever the subjective value they assign to the product they receive in a transaction outweighs the costs they must pay. By artificially setting the price of P to zero, monetization distorts this incentive so that, so long as the value of P is subjectively positive, C_p can always engage in some degree of consumption.⁸ This means that the monetization of P creates a market distortion that drives consumption beyond what would be expected in an efficient market.

The removal of cost-minimizing incentives, within a market where all products are monetized, changes the expected behavior of C_p relative to consumers in “normal” markets; this change distorts allocative efficiency.⁹ Rather than desiring to reduce costs while maximizing benefits, customers of monetized products are instead incentivized to maximize the benefits obtainable through the consumption of P without regard for P 's cost. This divorce of cost from benefit has two effects on rational consumers. First, they are driven to consume more of the product, since increased consumption does not correspond to increased cost (as illustrated in

Figure 3). Second, and most importantly, in the absence of costs (and discounting other factors such as network or lock-in effects),¹⁰ they look to consume the best product in P 's market layer, because the ordinary relationship between price, quality and quantity—that higher quality products tend to command a higher price but sell fewer units—has been broken. Therefore, monetized markets are prone to tipping towards the single best product, and exhibit winner-take-all dynamics.¹¹ The latter term refers to an often observed development on such markets, whereby the market share of the strongest firm “is continuously increasing, while other firms’ market shares are dropping” (Prüfer 2020).

Furthermore, a lack of cost-minimization incentives means that C_p has fewer incentives to actively search for the best deal. Even if there is a better alternative than P_i in P , the consumer may simply choose to use P_i because it is more convenient, as found in the UK’s Competition and Markets Authority’s report into digital markets (United Kingdom Competition and Markets Authority 2020).¹²

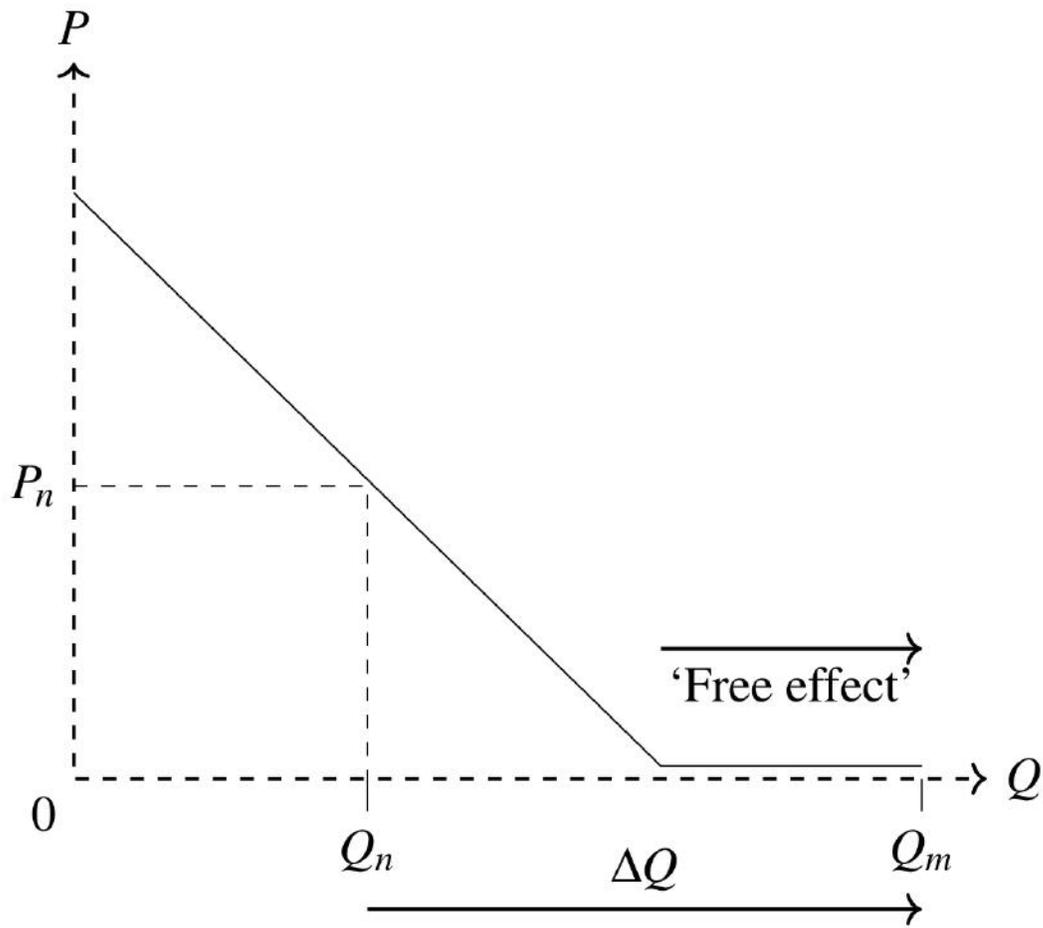


Figure 3: The demand curve for a product, where P_n marks the price at which consumers would value the service if it is not monetized, and Q_n marks the corresponding quantity expected to be sold. Q_m is the expected quantity consumed if the product is monetized, and the consumer is able to get the product for free, with ΔQ being the increased consumption as a result of monetization. Note that the “free effect” (that consumers value a product more if it is given away for free than if it is sold at an extremely low price) means that the consumption of the product may be far greater if it is priced at \$0 rather than at some nominal price (Gal&Rubinfeld 2016). Thus, it is likely that the demand curve would “jump” when the price is zero, increasing ΔQ accordingly (a phenomenon known as an “outward shift” of the demand curve).

III. Harms arising from integrated monetization

This paper aims to show that, while both vertical integration and monetization hold the potential to have pro-competitive and efficiency-generating effects, their simultaneous deployment can create serious market failures that harm consumers and make markets less efficient.

1. Market-Power Transfer

It is well known from economic theory that vertical agreements or vertical integration can lead to the transfer of market- power from one level of the market to another; this phenomenon is also known as monopoly leveraging(Rey et al. 2001, Whish&Bailey 2015). This is the case in monetized markets when the product layer (P) and the monetization layer (M) are integrated, since demand for P dictates supply at M . This means that, if market power is present at P , market power is also present at M ; after all, the integrated firm controlling P_i can allow M_i exclusive access to monetize C_p 's interactions with P_i and thus foreclose access to its competition in market layer M .¹³ This structure, wherein a firm is able to exercise a monopoly over access to its customers in P to restrict entry to M , is referred to as a “competitive bottleneck” making the integrated firm a “gatekeeper”, and an “unavoidable trading partner” in M (Alexiadis&De Streel 2020).

Building on these intuitions, this section shows how the Chicago School’s arguments for the pro-competitive nature of vertical integration do not apply in the context of a monetized market where P_i and M_i are both dominant and integrated. It outlines how, in this case, integration is motivated not by efficiency generation but rather by a desire to engage in anti-competitive practices for the purposes of increasing market power.¹⁴

The Chicago School’s first argument for why vertical integration is almost always pro-competitive hinges on the fact that consumers take the total price of goods into account, and as

such, the extension of a monopoly from one market to another through vertical integration only allows for one monopoly profit. In the case of monetized markets, there is one set of consumers, C_p on the product side, and one set of consumers C_m on the monetization side. The argument still holds for C_m , since firms in market layer M are motivated to charge a profit-maximizing price in all cases. However, in the case of C_p using monetized products in P , this argument no longer applies, since C_p makes the decisions of which product to consume, yet does not pay for the cost of consumption. Thus the tied and vertically integrated nature of P_i and M_i , which prevents competitors in M from having access to C_p through P_i , combines with the insulation of consumers of P_i from the cost of consumption. This integration allows the dominant position of P_i in P – gained through the aforementioned ‘free effect’ and the winner-take-all dynamics of zero-priced monetized markets – to be transferred to M_i in M .

Obviously, the zero priced nature of P does not lead directly to higher profit for the monopolist, but rather affords the monopolist market power in M , which allows them to gain profits indirectly. Thus although there is still only one monopoly profit extracted (from C_m), it is extracted on a different market from where the market power originated. This makes sense for the integrated firm in cases where it is able to extract more profits by charging monopoly prices in M (even while offering P_i to C_p without charge) than if it did the same directly in P . This method lets the integrated firm extract a larger profit from a monopoly in M than it could otherwise get from a monopoly in P , for instance when multinational corporations have larger advertising budgets (to spend in M) than typical consumers have disposable income for digital services (to spend in P). Eisenmann and his co-authors call this phenomenon “platform envelopment” (Eisenmann 2011).

Such a structure allows P_i to act as a moat for M_i . As long as P_i remains dominant in its market, M_i will also be dominant in its own market and be able to extract monopoly rents. As such,

it is imperative for the perpetuation of this structure that P_i remain dominant in its own market. The mechanism for this dominance is twofold.

First, while C_p is insulated from the price effects of the integrated firm's monopoly (since they do not pay), excessive monetization by M_i could still drive customers away from P_i . However, the economics of monopolies dictate that the mechanism for achieving monopoly profits is for M_i to restrict supply to C_m (Whish&Bailey 2015). This restriction aligns well with the customer satisfaction imperative for P_i .¹⁵ In addition, the vested interest of M_i in P_i incentivizes M_i to avoid overly-aggressive monetization of C_p which would risk degrading C_p 's experience, and jeopardize P_i 's dominance in P . As we will show, the imperative for M_i is to expand the market for P_i so that sales volume and thus revenue can increase in tandem, rather than aggressively extracting as much supply from the existing market as possible.

Second, some of the monopoly profits earned by the integrated firm are reinvested into customer acquisition in P 's market in order to maintain the monopoly. This means that competing firms which are not able to sustain similar indefinite "investments" into customer acquisition, such as those that do not monetize and attempt to make profits directly, are likely to be out-competed in market layer P . As for the remaining competitors to P_i , the monopoly profits earned by the integrated firm as well as its dominant position allow it to obtain the winner-take-all spot for monetized markets, ensuring the perpetuation of its monopoly (as described in Section 2.3).

Separately, the second argument of the Chicago School regarding vertical integration, "that an integrated firm would be able to foreclose rivals only to the degree that the firm had generated cost savings" (Khan 2019), is also nullified by the winner-take-all dynamics of monetized markets.

These dynamics arise from the fact that consumers do not pay for the cost of their consumption of products in P . Because consumers are incentivized to choose the best player in market P due to zero pricing policies, challenging an incumbent dominant firm requires the creation of the best product in market P upon market entry *and* simultaneous entry into market M (or a competent partner-firm), in order to generate revenue to challenge the incumbent firm in market P . This obviously raises the barrier to entry for P . It means both that competition within M is impossible by virtue of the dominant product (M_i) being tied to the dominant product in P (P_i), and that competition for the market by competing against P is now even harder than before.¹⁶

2. Efficiency losses

It is generally accepted in economic competition literature that vertical integration between firms generates efficiencies (Whish&Bailey 2015). Even so, these must be weighed against inefficiencies created through vertical integration of P and M in a monetized context.¹⁷

The fact that M_i is the sole distributor of goods produced by C_p 's interactions with P_i means that C_m does not have any alternatives in layer M which can also provide these goods. As a result, M_i faces no competition. As such, with C_m being a price-taker¹⁸ and C_p not paying any prices, if either M_i or P_i are to make efficiency gains which lower the total costs of production, then there is little incentive for the integrated firm to pass them along to C_m , as would happen in a competitive market.¹⁹ In this sense, vertical integration between P_i and M_i creates additional harm because efficiency gains in either P_i or M_i will be less likely to be passed on to consumers than if at least one of the markets was competitive.

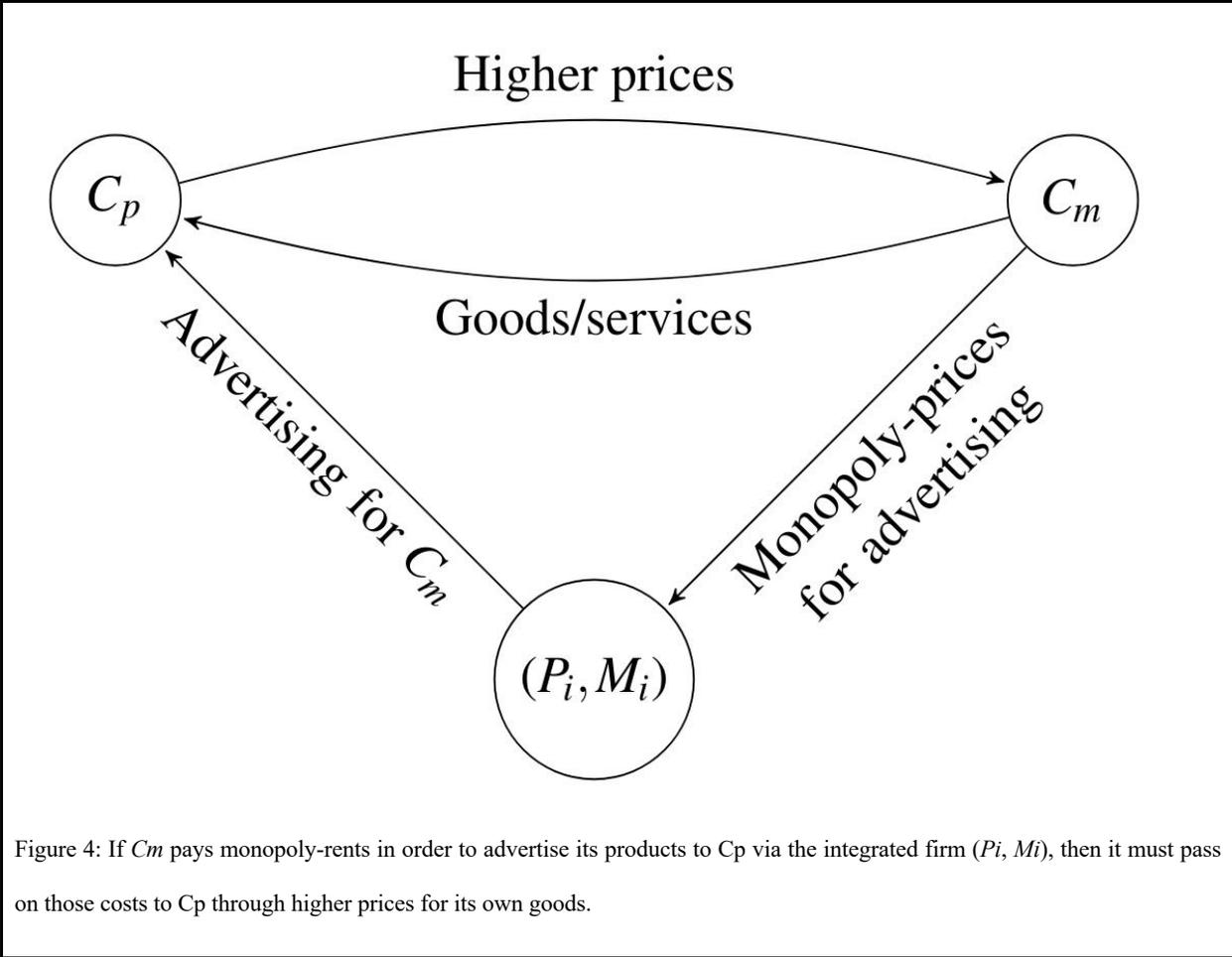
Thus, the loss of competition arising from tied and monetized products breaks the critical efficiency-generation function of the market. This becomes detrimental to society, and a

significant departure from the model of perfect competition, if large parts of the economy are dominated by firms that engage in these practices.²⁰ While there is still an incentive for the integrated firm to create efficiencies in order to reduce its costs, this pales in comparison to conventional markets, where being out-competed by other firms as a result of being less efficient represents an existential threat rather than a missed opportunity for extra profit.

3. Indirect consumer harm

Although it is easy to see that less-efficient markets are harmful on the whole, there is also the perspective of consumers to consider. First, it is obvious that consumers receiving access to valuable goods and services without having to pay is beneficial, from the perspective of consumer welfare. Nonetheless, one could also argue that C_p is indeed paying, since in many cases, C_m sells directly to C_p —such as when C_m advertises products for sale to C_p via M_i —and thus C_p pays for the increased costs of using M_i indirectly, through higher prices or lower quality of C_m 's goods (see Figure 4)²¹. Such an arrangement means that the costs of C_p 's consumption of P_i are merely shifted from direct payments to P_i (as would be the case in a conventional market) to indirect payments to M_i via C_m , which in turn funds P_i .

Second, the Chicagoan idea that excess profits earned by the integrated firm would themselves provide an incentive for other firms to enter the business falls down, in cases where P_i is artificially monopolized by extra profits from M_i as was described in Section 3.1.



4. Marching monopolies

The self-interest of sovereign market participants means that conventional monopolies are limited by the demand curve of the market, which acts as a natural upper limit for the scale to which a conventional monopoly can rise.²² Typically, this means that, although monopolies can raise prices, lower quality, and create inefficiencies, they are also bounded by the demand curve of their customers and the supply curve at which they can produce.

However, this barrier can break down in tied monetized markets, since the integrated firm gains the ability to influence the supply and demand curves for M through its control over P . This allows for the creation of a “marching monopoly”, so called since it continually moves to the right

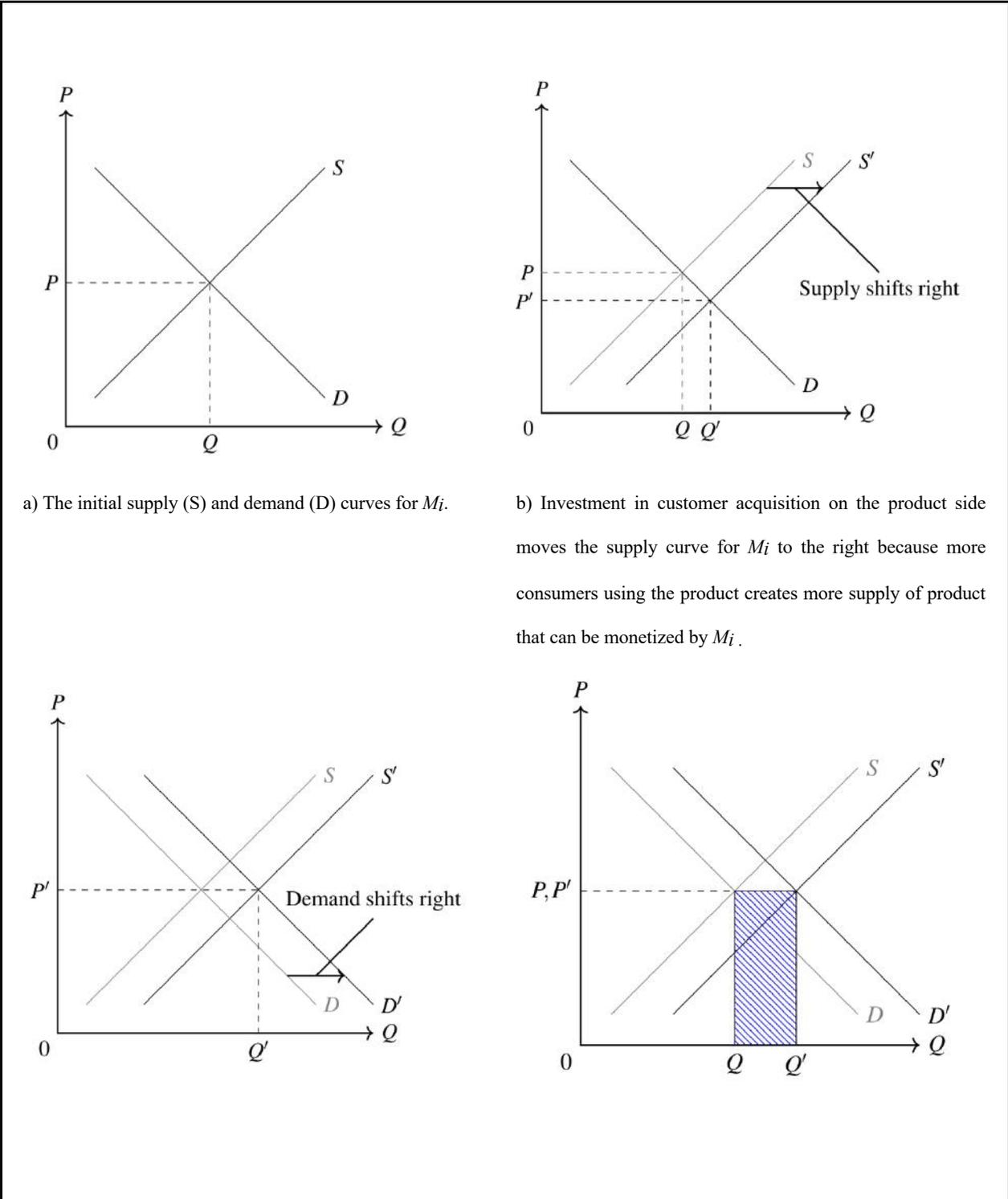
of the supply/demand graph, which allows the integrated firm to increase the quantity of goods sold while maintaining prices at monopolistic levels.

Specifically, as depicted in Figure 4, an underlying motive for C_m to purchase products at M is in order to get access to C_p at the upstream market layer P .²³ In that case, one would expect that growing the size of and increasing access to consumers through P would increase the value of, and thus demand for M (Eisenmann et al. 2006, Pavel 2009). Likewise, the nature of P , as constituting the supply for M means that increasing the size of P increases the amount of monetizable interactions occurring through P , thus lowering the supply curve for M .

As shown in Figure 5, this creates a cycle, whereby monopoly profits earned by M_i are reinvested to grow the market for P_i ever larger, which then increases the market for M_i and provides more capital to expand P_i .²⁴ Note that growing the market for P might involve finding new market-footholds in entirely new lines of business, so long as these businesses can also be monetized by M_i or drive demand for P_i , a strategy known as “platform envelopment” (Eisenmann 2011, Alexiadis&De Streel 2020). Even if diseconomies of scale eventually slow the growth-cycle, the titanic scale of the resulting conglomerate, and its control over both M and P , likely means that its monopolization has generated significant harm when compared to the alternative where there is no monopoly.

Likewise, it is possible that the growth-over-profit strategy employed by P would have “disrupted” many industries, to the point where the non-monetized and ordinarily-profitable incumbent competition has been chased out of the markets by aggressive competition by the integrated firm.²⁵ While this competition could mean short-term gains in consumer welfare as prices are reduced (or dropped to zero), the loss of a competitive market and the harms of

monopolization in markets P and M mean that over time, consumers will likely be harmed no matter what else occurs.



a) The initial supply (S) and demand (D) curves for M_i .

b) Investment in customer acquisition on the product side moves the supply curve for M_i to the right because more consumers using the product creates more supply of product that can be monetized by M_i .

c) An increased consumer-base for the monetized product stimulates demand for M_i , because C_m can reach more customers through the product than before.

d) The increased supply of monetizable interactions caused by more usage of the product and the concomitant increased demand at M_i means that the price of M_i can be maintained while the quantity sold increases, leading to an increased revenue equal to $P(Q' - Q)$.

Figure 5: A series of price-quantity graphs for M_i showing the progression of a “marching monopoly” caused by tied product and monetization layers. As long as the monetized product market can continue growing, and the demand at M_i grows proportionally to that of P_i , the monopoly can “march” to the right.

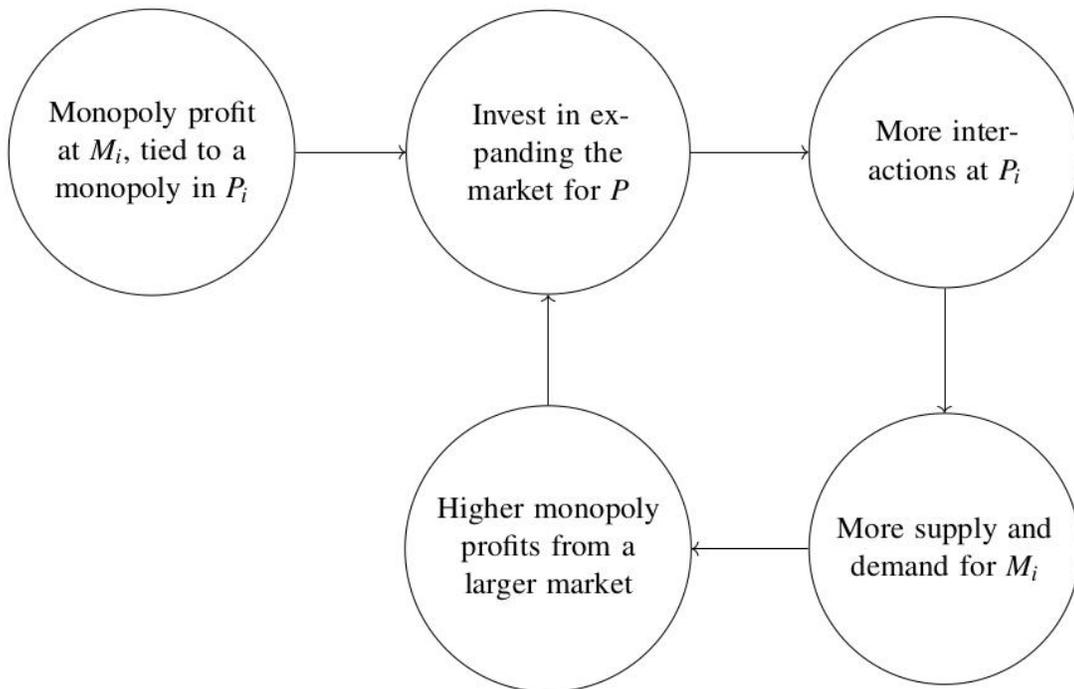


Figure 6: The monopoly profits at M_i are used to expand P , which in turn expands the market for M , allowing for the capture of more profit and the perpetuation of the cycle.

Thus, there is an incentive for integrated firms to expand the size of the market for P as much as possible. These incentives can result in their expanding the scope of P to encompass many seemingly different products (e.g., social networks, search products, mobile phones, app stores, and so on), so long as they all contribute to shifting the supply curve for M to the right.²⁶

Observe that, according to this logic, innovations produced through this process are born from a desire to expand the size of the market, in order to drive demand for M_i .²⁷ As such, this growth, while fueled through innovation to some degree, is ultimately aimed not at the creation of consumer welfare, but at maximizing consumer engagement with products in P , regardless of the eventual outcome for consumers.

IV. Marketization as a tool to fix market failures arising from monetization

It is clear that monetization benefits but can also harm consumers and businesses alike. The challenge is to specify how monetization can continue to be used while retaining the competitive incentives in markets, thus safeguarding their efficiency.

This task is complicated by the tightly coupled nature of monetized products as described in the model given in Section II. This section aims to first highlight the need for structurally oriented regulatory intervention. Furthermore, it will show the benefits of disintegrating the product used by consumers (products in market layer P) from the monetization product that funds their usage (products in market layer M). This disintegration creates the possibility for competing firms to be involved in the production of the end-products used by C_p and C_m in order to expose the single monopolistic integrated firm to competitive pressure.

As such, it describes *marketization*, which is a market institution able to achieve decoupled monetization through the creation of a competitive market for M . In turn, this allows C_p to choose which monetization firm to contract with. Marketizing M prevents integrated firms from transferring power from P to M , and thus arrests their accumulation of market power, the creation of marching monopolies, and the harms associated with both.

1. The need for structurally oriented regulation

Structural remedies, such as divestitures, are intended to maintain or restore competitive structure inside a market, and are typically applied as an ex-ante²⁸ rule in anticipation of problematic conduct on markets characterized by systematically weak competition. Behavioral remedies, in turn, can be applied in any market context and are designed to modify or constrain one-off anti-competitive conduct of firms; they are often applied ex-post and are core antitrust enforcement tools (International Competition Network Merger Group 2016). Structural measures used to be a mainstay of sector-specific regulation (telecoms, gas, airlines, etc.) in the US in the 1970s, but with the advent of Chicago thinking, have been largely superseded by a less-interventionist approach based on laxer behavioral measures (Khan 2019).

This paper takes the view that the harms of integrated monetization should be addressed by viewing integrated monetization as a structural problem. Thus, remedies that offer structural solutions should be used. That said, note that this does not preclude behavioral remedies such as mandated interoperability, which act similarly to purely structural remedies, though without actually separating firms.

In itself, structural regulation can ensure that the profit-maximizing incentives of individual firms are aligned with the behavior required to create competitive outcomes for the whole market

(Maier-Rigaud 2016). Such a regime has huge advantages compared to the Chicagoan *status quo*, because its self-policing nature reduces the workload of competition authorities (International Competition Network Merger Group 2016, Khan 2016). This is especially important in the case of digital markets, where it is imperative to avoid a tight coupling of policy to constantly-changing technological advances, as is the necessity for behavioral regulation (Bar&Sandvig 2000).

The speed and timing of decisions about a market is important, since if a market is prone to tipping, as Section 2.3 showed for monetized markets, it may have already done so by the time a ruling is made. Structural remedies offer two benefits in this regard. First, uncovering violations of imposed structural remedies requires less technical expertise and legwork on behalf of authorities. Second, when regulators separate out individual businesses from large conglomerates, the complexity of each individual business is reduced (Garofalo et al. 2020). As such, structural regulation is likely to be quicker to enforce than behavioral regulation, and so more likely to correct anti-competitive behavior before markets can tip. Even if a competition authority is able to create a timely behavioral remedy, the fast-moving nature of digital economies means that it may be useful for a disappointingly-short period of time.²⁹

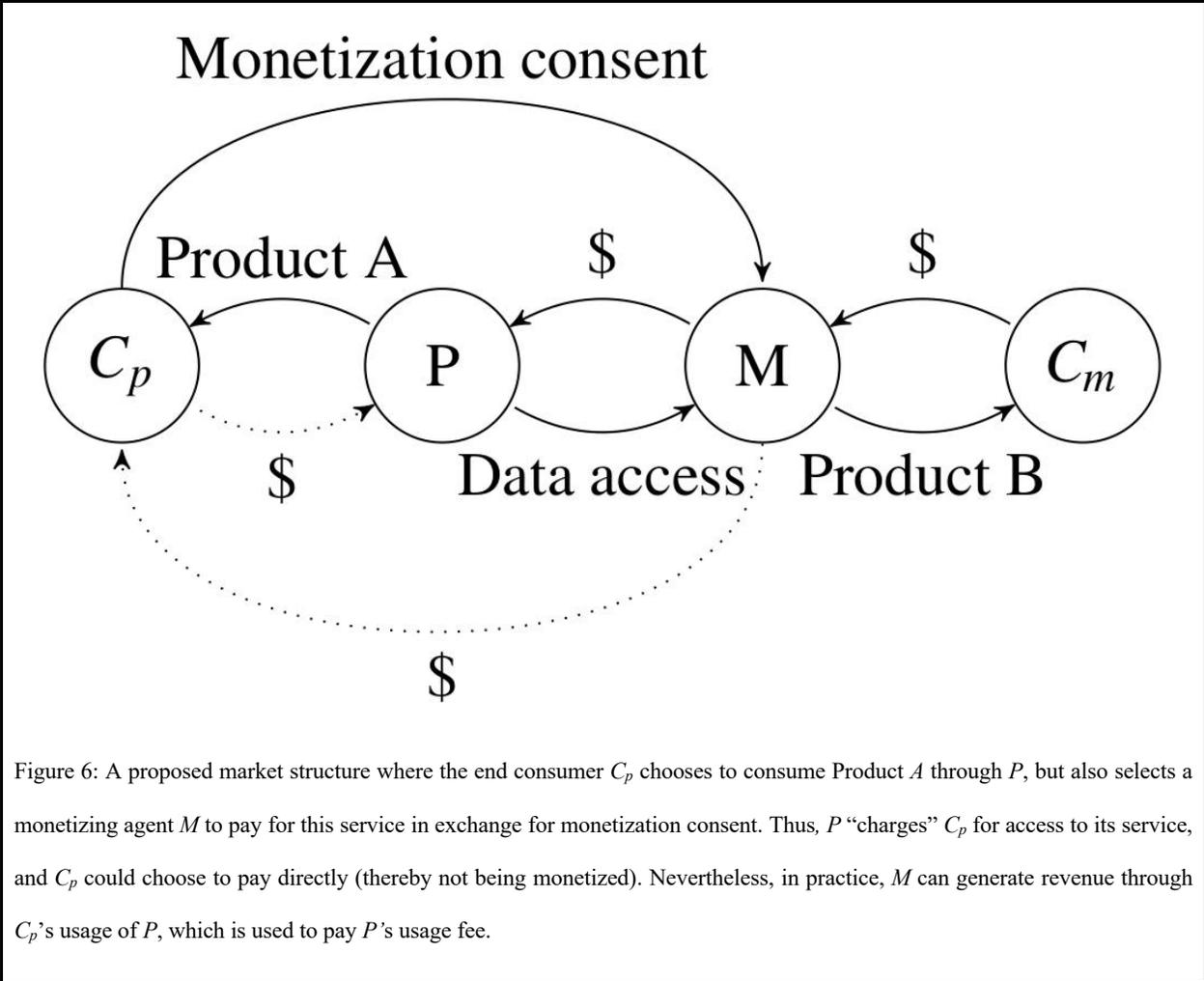
2. How marketization can be implemented for monetized markets

The core reason for the market failures of monetized markets, is that markets tip towards the single best product in P ,³⁰ which is then improved further due to monopoly profits in the tied market M .³¹ The integration between M_i and P_i not only safeguards the dominant position of an integrated firm, but also insulates individual consumers from the costs incurred by their consumption.

This paper proposes to disintegrate P_i and M_i , in order to create two functionally-separate entities. This could be achieved through structural regulation, for example, by mandating a

divestiture in order to create two separate companies, or through behavioral regulation that has structural effects, such as a mandate that products in P must be interoperable with products in M .³² This is possible in digital markets because consumer products are personalized and created in real-time. The aim of such operations is to turn the single profit-maximizing incentive of the integrated firm into the separate and oppositely aligned incentives of P_i and M_i . This is achieved by rearranging the model first presented in Figure 1 (right panel) with two key changes in order to “marketize” the monetization; first to have P_i “charge” C_p for access to its service (at least in principle), and second, to have C_p contract with a firm in M in order to generate revenue with which service charges from firms in P can be paid.³³ The updated diagram can be seen in Figure 6.

Crucially, market layer M should be marketized in such a way that C_p can select from a variety of different firms within M , each with its own competitive offering. The capacity of consumers to specify which firms participate in the creation of the goods and services they consume is called *delegability* (Windwehr&Schmon 2020). In order to facilitate delegability, P_i must allow vertical interoperability between itself and different firms in market layer M .³⁴ Thus, one important effect of M ’s marketization is to afford consumers more sovereignty by allowing them to exercise greater choice over the firms with which they do business with.³⁵ In such a market, C_p could even pay directly for P_i and thus avoid being monetized at all. In the context of digital advertising, this gives C_p back their autonomy (freedom from observation) and seclusion (the right to be left alone) as described by Hui&Png (2005), and solves the dilemma posed by Cooper (2012) that some consumers may care little about being tracked online while others may care greatly.



As various authors clarify, price-analysis methods used by conventional competition analysis are ineffective at determining the market power in cases where consumers access products and services at zero cost (Waller 2011, Gal&Rubinfeld 2016, Crémer et al. 2019). The marketization of M solves this dilemma, by ensuring that firms in P do charge a price for their products, even if consumers themselves do not pay directly. As such, with the introduction of prices to market layer P , the SSNIP test and other forms of price analysis can more easily be used to determine the extent of market-power that firms possess.

3. How marketization prevents market failure

This section analyzes the incentives of market participants if P_i and M_i are separated out into two functionally separate entities, and C_p is able to choose which firm in market layer M to be monetized by; we call this process *marketization*. It shows how marketization prevents monopoly power from being transferred from market layer P to market layer M , and how the introduction of competition at market layer M thins profit margins which cannot then be returned to reinforce growth-over-profit strategies at market layer P .

Marketization of M fundamentally changes incentives on the whole market, primarily by ensuring that firms in M are exposed to direct competition by making the market contestable. Specifically, firms in M are forced to compete on two dimensions. First they must compete in order to sell to C_m , who in turn, will be aiming to find firms with low prices but high-quality products. Second, they must compete to attract C_p to their network in order to gain the “raw material” with which to create product that can be sold to C_m .³⁶ C_p has incentive to choose a firm at M which will cover their usage costs of P through monetization, in the most convenient way for them.³⁷ Convenience from the point of C_p could be data protection standards, minimal monetization (e.g., fewer ads), customer service, and so on.

Note that the aim of a remedy which marketizes M is to ensure that firms in M compete for the privilege of monetizing customers who are using P . This paper considers a continuum of regulatory solutions for achieving this end, from “weak” marketization, which would constitute a behavioral remedy imposing interoperability regulations on P_i so that it can be used by other providers of monetization in the market for M , to “strong” marketization which would be a structural remedy forcing the integrated firm to divest from M_i . Stronger forms of marketization

are likely to be more drastic, but would have the added advantage of preventing firms from both running and participating on the same market without limitations on unfair conduct (Srinivasan 2019).

This arrangement means that firms would find it hard to extract supernormal profits from M ; if C_m is overcharged, they could easily move to other monetizing firms, and if they overmonetize C_p , then C_p can do the same.³⁸ This is obviously good for consumers, since C_m will be charged lower prices (and which may also decrease prices that C_m may later charge to C_p), and C_p will get higher-quality monetization. Such interoperability could bypass the need for horizontal data-sharing regulation as proposed by various authors (Gal&Rubinfeld 2016, Graef 2016, Crémer et al. 2019, Furman et al. 2019, Parker et al. 2020, United Kingdom Competition and Markets Authority 2020). For example, if C_p were to grant firms in M access to its data stored by firms in P , all firms in M would have automatic access to C_p 's data when C_p chooses to be their customer and consents to be monetized. This means that switching between monetization firms is easy for C_p provided awareness of this option;³⁹ assuming firms in P and M are vertically interoperable (as explained in Section 4.1), only the legal right to access and process C_p 's data need be transferred from the old firm in M to the new one, after which P_i will use the new firm for monetization.⁴⁰

Finally, all firms in M have a high incentive to innovate in order to lower costs or increase quality. Significantly, they are motivated to pass these gains onto consumers in order to gain market-share from their rivals. Such an arrangement differs from the status quo, where the dominant position of incumbents as a result of integrated monetization means that any efficiency gains need not be re-invested into lowering prices or increasing quality; instead, firms may retain efficiencies as profit, thus breaking competitive dynamics.

Likewise, P_i now needs to compete on its own merits and cannot rely on monopoly profits extracted by M_i from market layer M . That said, if it has market power then it may be able to set a monopoly price for its own service. Nonetheless, even if P_i has market power, there are four factors that make the market power of P_i on its own less problematic than the market power of an integrated firm controlling both P and M .

First, competition in the monetization layer means that P is less able to leverage its market power into a larger adjacent market (as described in Section 3.1). As such, P is only able to use its market power to extract supernormal profits in its own market, which is by definition smaller than the combined markets of P and M .

Second, while P_i had previously benefited from surplus funds from monopoly profits at M (as described in Section 3.4), the marketization of the monetization layer and commoditization of its product means that it must charge its monopoly profits in its own market layer. This change has a leveling effect, since—in order to maintain its dominant market share—it must compete against other firms in its own market which now compete on a more level playing field.

Third, if P_i pushes prices too high, then firms in M may struggle to generate enough profit through monetization to fund C_p 's usage of P_i .⁴¹ Alternatively, these firms would be forced to aggressively monetize C_p , to the detriment of their user experience of the product. In this latter case, consumers could be pushed to consider using P_i 's competitors as to avoid the aggressive monetization required for firms in M to profit. If competitors do not yet exist (i.e., if M has been marketized, but P is still dominated by a single firm), then this provides a stronger incentive for other firms to enter the market for P , thus also increasing competition in the market for P .

Finally, in the case where P_i and M_i are disintegrated, new competition in P is free to contract with M_i in order to compete against P_i , something not possible when P_i and M_i are

connected. The converse of this phenomenon also applies, if new competition arises for M_i . As a consequence, barriers to entry are lowered for both P and M , ensuring that consumers can pick the most efficient combination of firms from both rather than choosing from a selection of pre-defined bundles of options.

All of these factors degrade the ability of P_i to maintain its monopoly, by reconstituting the link between C_p and price or performance incentives at market layer M . Thus, the re-introduction of competition at market layer M can also encourage a similar effect in market layer P - even if P_i remains dominant, the reach of its market power is vastly diminished.

4. Avoiding inefficiencies

One obvious concern with structurally-oriented remedies that break up previously-integrated businesses is that they could introduce inefficiencies that degrade the quality of the end products consumed by both C_p and C_m . These events could, in turn, reduce the economic value of the products overall; this represents an outcome good for nobody (Manne et al. 2020). There are two reasons why this need not be the case.

First, if P and M are structurally separated, as outlined in Figure 6, then firms in M could be granted access to C_p 's data stored by firms in P as a condition of monetization (as indicated by the arrow labeled "data access"). Crucially, this means that the same data would be available to firms operating in a post-marketized M as would be available to M_i in the integrated firm, and thus there is little reason to think that the quality of the monetization would be any lower. On the contrary, in the marketized case, a consumer can use the same monetizing firm across multiple distinct monetized products (e.g., for their social network *and* search engine), which would allow for the productive combination of data from both sources in a way not possible in vertically-

integrated markets. This also affords consumers better control over who is monetizing their data, since firms in P would be prevented from doing so, and firms in M could be required get explicit consent from C_p . Furthermore, all firms in M would have equal access to data gathered by firms in P , so that they may compete on the merits and efficiency of their information-extraction processes which convert the raw data from P into valuable information. As such, rather than degrading the quality of monetization, the introduction of competition is likely to drive it ever higher. In addition, products in both P and M would retain their internal network effects since they would remain whole, if separate entities.

Second, the incentives are aligned so that it is in the interests of all parties that monetization works well and is of high quality. C_p is incentivized to choose a monetizing firm in M which efficiently generates enough revenue to cover the costs incurred by their usage of products in P , while monetizing them as little as possible. Firms in P have an incentive to create and maintain robust and comprehensive APIs (Riley 2020)⁴² to provide data access to firms in M , so that they may efficiently monetize consumers and generate revenue to pay P .⁴³ Firms in M are incentivized to make the most efficient use of, and extract the most value from, consumer data obtained from firms in P , so they can create higher quality products to sell at a higher price to C_m . Finally, C_m will want to purchase products in market M which have the best price-quality trade-off, thus favoring efficient firms in M .

Divesting parts of a business can incur significant costs; this forms another source of inefficiencies arising from structural remedies. Though the high cost of structural separation is an unavoidable truth, that cost can be mitigated to some extent by applying behavioral regulation with structural effects such as interoperability mandates between P and M , rather than by requiring outright divestiture. This approach also has advantages from a legal perspective because it scores high

on proportionality grounds and as such offers a sensible middle-of-the-road solution that we support. What should be unequivocally avoided, however, is a policy of non-intervention that allows firms to “scramble the eggs” by tightly integrating multiple markets ever more closely, until they have built an unassailable platform that would incur ruinous costs if interoperability were to be enforced. Next, we shall turn to the discussion of remedies in current policy debates, and their relation to our marketization concept.

V. Policy developments around digital platforms and possible legal remedies

In mid-December 2020, within the framework of its European Digital Strategy, the European Commission issued the legislative proposals for a Digital Markets Act (DMA) and a Digital Services Act (DSA). Because only the former instrument has a direct bearing on the (upcoming) regulation of zero-price vertically integrated platforms, we will focus exclusively on it. The DMA is set to be enforced as an ex-ante regulatory regime that complements ex-post competition enforcement where the latter (i) does not apply or (ii) is ineffective (DMA, recital 5).

The Commission considers two elements of antitrust ineffective, its slowness and its market-definition-based reasoning, when applied on digital markets. The latter always requires delineation of “specific markets” (DMA, recital 5). To counter the latter deficiency, the instrument introduces the threshold category of “gatekeeper,” which—if reached—puts the business within the scope of the DMA, without requiring market delineation (Article 3, DMA). At that point, a number of behavioral remedies automatically start applying to the gatekeeper (Article 5, DMA), and a number of additional ones are imposed after negotiation with the enforcer (Article 6, DMA). The option for structural remedies is also not discounted, but rather presented as a last resort measure (Article 16.2, DMA). It is of note that the Commission’s preparatory work on the DMA

(the unrealized proposal for a New Competition Tool) recognized “structural market failures” on digital markets, and the necessity of a tool that allows for intervention *before* competitive harm materializes (“ex-ante”). In this sense, it is strange that the DMA treats the structural remedy option as a last resort. We will now examine this argument, as well as some concrete behavioral remedies under Articles 5 and 6 of the DMA. Finally, we test their congruence with marketization.

1. The proposal for an ex-ante regulatory solution (the DMA)

Dearth of structural remedies

When one considers policy and regulatory intervention, one needs to be mindful not only of the economic theory but also of the surrounding legal and political considerations. Hence, the Commission’s caution regarding structural remedies might be driven by: (i) the (likely) international character of to-be-designated gatekeepers, (ii) proportionality, and (iii) the competition-inspired nature of its behavioral remedies under Articles 5 and 6 of the DMA.

The first consideration is pragmatic: given that many of the potential gatekeepers under the DMA will likely be international companies, an imposed structural separation of their EU assets only might prove unnecessarily cumbersome. This could trigger concerns of stifling business acumen through regulatory interventions, or even of the EU’s boycotting innovative foreign businesses. Second, proportionality in the application of remedies is a legal issue that enforcers must consider in their assessments. Proportionality requires a strict weighing of means and ends, with the caveat that parties should use the least-restrictive means to an end. In the context of remedies, if both a behavioral and a structural option are equally effective, the former will prevail. This consideration could inform the DMA’s “last resort” attitude to structural remedies (Article 16.2, DMA).

Our third and last concern is more complex. Since the publishing of the preparatory instruments of the DMA, commentators have observed that the Commission’s inventory of envisioned remedies can target behaviors that either a) are currently under review in competition cases or b) heavily draw on competition-based understandings of harm (Lamadrid 2020). Hence, concerns of regulatory conflict between the two regimes have pervaded the literature. While ex-post competition and ex-ante regulation use the same remedial toolkit, the Commission has traditionally hesitated to use heavy structural remedies to enforce competition. This is so because of the EU policy line of a more flexible, effects-based enforcement under the influence of the Chicago School.⁴⁴ Since many of the practices automatically outlawed under the DMA’s Article 5 are currently under review in competition cases at the level of the CJEU or in Member States, questions and doubts concerning the imposition of structural remedies are apt.

However, as mentioned earlier, Chicago School ideas might have to be qualified in their application to digital markets – an issue that sits at the core of economic analysis, law, and policy in the field.

Abundance of behavioral remedies

The above concerns regarding structural remedies invalidate neither the need for an ex-ante approach to regulation, nor the question whether the hurdles to contestable markets could be addressed through behavioral remedies instead. Here, we want to remind the reader that our approach favors behavioral remedies that have structural effects; wherever such remedies are listed under the DMA, we could conclude that the proposal is compatible with our idea of marketization. More importantly, marketization can be reinforced through the DMA. Hence, the pertinent question is: do Articles 5 and 6 of the DMA include behavioral remedies that have structural effects?

Many remedies under these provisions aim to make the business models of designated gatekeepers more open, but do not mandate true interoperability (the latter being our preference, as explained in Section 4). This is why some scholars have expressed the view that the proposal could have been bolder (Robertson 2021). The strongest DMA provision⁴⁵ that comes closest to an interoperability obligation is Article 5c of the DMA. This article contains an obligation that allows business-users to choose how they promote offers to end-users through the core platform service. That is business users are no longer tied to their core platform, but can opt for informing their customers of other ways in which to purchase products and services. As a next step, notwithstanding the channel of purchase, the core platform is obliged to ensure proper user-experience with the product/service in question.

By analogy, this provision can ensure marketization of zero-price vertically-integrated platforms *once* market M (ad networks) has been opened for competition through a true interoperability requirement. Concretely, the prescription of Article 5c can apply only once there has been mandated entry, ensuring more than one supplier on market M . However, the DMA does not envision a tool to that effect. Should such a tool exist in future versions of the DMA, the next step would be to use Article 5c to make users C_p choose providers in M , by allowing the latter to approach C_p with information about different offers and where/how they could be “purchased.” Crucially, the success of this model will depend on consumers’ awareness of their monetization and their willingness to control its use. At this juncture, we enter the domain of consumer law and policy, which is beyond the scope of this paper; nevertheless, given the centrality of the consumer for competition in digital markets, this issue certainly needs further scholarly attention.

In summary, the DMA needs greater reinforcement in order to secure true interoperability and infuse with competition at least one side of the (two-sided) market, on which zero-price vertically integrated platforms operate. Thereafter, users could effectively apply Article 5c.

2. Reverting back to ex-post competition enforcement

Because ex-post competition enforcement is currently the regime used to curb power on digital markets, and because this will not change until late 2023 (Wiggers et al. 2020), we must discuss how that enforcement can apply to the business models of zero-price vertically-integrated platforms. This discussion comes with the caveat that, although competition policy does not target structural market failures (such as those detected in Sections 3 and 4), it can provide both structural and behavioral remedies on a case-by-case basis. To the extent that the EU Commission has now started competition investigations of all the major digital platform giants, and on the assumption that it will likely opt for behavioral remedies with a structural effect (Turner 2020)⁴⁶ the ultimate effect on the market generated by ex-ante or ex-post intervention against zero-price platforms may be similar. How can marketization be captured under the EU's competition legal framework?

With respect to the concrete abuse of market-power, under which the practices described above could be caught (see Section 3.1), the ability of the integrated firm to transfer market power from P_i to M_i underpins the harmful business model of connected monetization. In order to prevent this transfer, one could use Article 102 sub-d) of TFEU. This is the so-called “anticompetitive tying” provision which constituted the legal ground used in ordering Microsoft to unbundle Internet Explorer from its Windows OS in the early 2000s. The theory of harm under tying lies precisely in the fear of the leveraging of power that a company dominant in one market can use to enter and subsequently monopolize another (adjacent) market. As we saw earlier, the theory of

leveraging is a prominent concern in the workings of zero-priced platforms. Therefore, tying as an ex-post enforcement strategy could be suitable in “catching” such practices. In particular, it could be argued that by forcing consumers into accepting monetization, P_i is *making the conclusion of contracts subject to acceptance by the other parties of supplementary obligations* (Article 102 d TFEU).⁴⁷

One way to address this concern through an appropriate ex-post remedy, would be for C_p to be given sovereignty over how they pay for P_i . This could effectively work by introducing the same remedial system as described in the previous section, only using Article 102 TFEU. Therefore, a solution not dissimilar to the one envisioned by ex-ante regulation is achieved, with the caveat that ex-post competition enforcement works much slower than the envisioned ex-ante regulatory tools. Therefore, to the extent that expediency might be of the essence in digital markets, one might consider using ex-ante regulation—a point also made in the proposal for a DMA.

VI. Conclusion

As markets evolve, it is vital that competition law reacts in kind, so as to preserve the competitive nature of markets and their benefits. This paper contributes to the debate on appropriate policy and enforcement responses within the realm of competition and regulation in order to achieve that aim in the context of a continuing digital revolution.

This paper shows how current doctrine is not applicable in the context of developments in digital markets, highlighting how zero-priced products break long-standing assumptions about relationships between market participants, and how vertical integration can be truly harmful in those situations. The paper further describes the misaligned incentives for integrated firms in several situations and outlines how the economically rational actions of such firms can result in

reduced innovation and consumer sovereignty. Finally, it makes proposals for new regulation that can fix the permanent market failures arising from the integration of monetization services with products used by consumers.

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Proposal for a Regulation of the European Parliament and of the Council on Contestable and Fair Markets in the Digital Sector (Digital Markets Act) COM (2020) 842 final (Dec. 15, 2020).

¹ Monopsony, or countervailing buyer power, is "bargaining strength vis-à-vis a seller due to its size, commercial significance and its ability to switch to alternative suppliers." Whish R, Bailey D (2015) *Competition law*. Oxford University Press, USA.

² Specifically, downstream firms force upstream firms to lower prices by threatening to change suppliers, and upstream firms refuse to sell at below-cost prices. See Easterbrook FH (1984) Vertical Arrangements and the Rule of Reason. *Antitrust Law Journal* 53, 159-161.

³ Zero-price markets are those "wherein firms set the price of their goods or services at \$0," Newman JM (2015) Antitrust in Zero-price Markets: Foundations. *University of Pennsylvania Law Review*, 149-206.

⁴ This is similar to the concept of 'behavioral surplus' as described by Zuboff, though not limited to the creation of 'prediction products'. Zuboff S (2019) *The Age of Surveillance Capitalism: the Fight for a Human Future at the New Frontier of Power*. Profile books.

⁵ It is common to think of consumers 'using' Facebook and advertisers advertising 'on' Facebook rather than thinking of Facebook as consisting of a social network and an advertising network which are two different but related products.

⁶ An example would be if the upfront price of an e-reader was discounted and cross-subsidized by paying lower prices to publishers for their e-books. That would only work if the manufacturer has market power in the e-book market that allows extraction of increased profits from the sale of e-books through lower prices paid to publishers.

⁷ This assumes that consumers are not swayed by other costs such as privacy violations or perceived social harms that could arise through use of a monetized product or service.

⁸ This analysis is based purely on price and ignores other costs that consumers could take into account, such as the time cost involved in consumption. However, the thrust of the argument remains: consumers are incentivized to consume more when prices are discounted.

⁹ The term 'allocative efficiency' refers to the state of perfect competition whereby economic resources are allocated between different goods and services in such a way that it is not possible to make anyone better off without making someone else worse off (the Pareto principle).

¹⁰ For instance, a consumer may not use the highest-quality free social network if their friends all use another social network. We hypothesize that in these cases, the absence of monetary incentives reduces the need for consumers find the best price-performance trade-off for their needs. They instead settle for a good-enough free service. This degrades the ability of firms to compete, since in contrast to conventional markets, price is not part of a competitive offer and price-competition is no longer a viable market mechanism.

¹¹ This also drives up the risk of market entry; unless a competitor is able to produce the best product in the market, it is likely that they will not be able to gain much foothold at all.

¹² The report found that "default positions have a significant impact on consumer behavior", and that a positive feedback loop occurs when a high market share leads to an increased ability to maintain default positions.

¹³ If other firms in market layer M are able to source supply from places other than P_i , this effect is reduced. However, in many segments, a monopoly over P grants a de-facto monopoly over M (such as having a monopoly in social networks grants a monopoly over social network advertising, assuming that advertising on social networks is sufficiently distinct from other forms of advertising).

¹⁴ Evans writes that "efforts to coordinate interdependent markets - and thereby produce potential efficiency gains in multi-sided markets - must be distinguished from efforts to extend a monopoly from one product to another." Evans DS (2003) *The Antitrust Economics of Multi-Sided Platform Markets*. *Yale Journal on Regulation* 20, 325.

¹⁵ This assumes that monetization negatively impacts C_p 's experience of P_i . For example, where monetization is achieved through advertising, consumers may not appreciate being shown more ads.

¹⁶ Even assuming firms can compete within P , some authors are skeptical of the equivalence of substitution between competition for and in the market. See generally Crémer J, de Montjoye Y-A, Schweitzer H (2019). *Competition Policy for the Digital Era*. European Commission.

¹⁷ In digital markets with a high volume of transactions, even small inefficiencies can incur high costs.

¹⁸ In 'perfect competition', producers are price takers. The term also refers to generally not having power over pricing; this is the meaning we use here.

¹⁹ In a competitive market, the integrated firm aims at gaining a larger market share. A drop in its marginal costs allows it to pass these cost savings on to consumers and take business away from its competitors. Whish R, Bailey D (2015) *Competition law*. Oxford University Press, USA.

²⁰ The potential for harm is great considering that the top five firms in the US economy are tech giants, all of which employ monetized vertical integration. Jamison M (2019) Applying Antitrust in Digital Markets: Foundations and Approaches. *AEI Paper & Studies*, 1.

²¹ UK Competition and Markets Authority (2020). Online Platforms and Digital Advertising Market Study Final Report. Competition and Markets Authority. Part 6.20.

²² Rational market participants only transact when they get a net-positive value. Thus, monopolies cannot raise prices without a corresponding drop in demand, and are bounded in how much profit they are able to extract.

²³ This is the case with many monetized markets today; ex: advertising where brand owners (C_p) want their brand to reach as many consumers (C_p) as possible.

²⁴ This provides an alternate theoretical basis for the empirically observed upward sloping MR and MC curves of FANG firms as observed by Petit, but going further, suggests that in addition to firms having a short-term interest to grow output as suggested by Petit, their long term interests are also aligned with this goal. Petit, N (2019) Are 'FANGs' Monopolies? A Theory of Competition under Uncertainty. Available via SSRN doi: <https://dx.doi.org/10.2139/ssrn.3414386>.

²⁵ Parker, Petropoulos and Van Alstyne describe how network effects and economies of scale and scope make it hard to dislodge a monetized early mover who has 'disrupted' a new market. Hence, conventional firms aiming to make a profit out of the market cannot hope to outcompete a firm with large amounts of funding from an adjacent monetizing market.

²⁶ Feld uses Amazon to describe how entering an increasing number of businesses and tying them together, as possible in the case of monetization, has a snowball effect since the strength of each business in the network is increased when another is added. Feld H (2019) The Case for the Digital Platform Act: Market Structure and Regulation of Digital Platforms. *Roosevelt Institute & Public Knowledge*.

²⁷ This logic of endless growth of product lines, regardless of the worth of the product itself is highlighted by Zuboff. See Zuboff S (2019) *The Age of Surveillance Capitalism: the Fight for a Human Future at the New Frontier of Power*. Profile books.

²⁸ 'Ex-ante' and 'ex-post' are terms of art in the field of economic regulation; the former is used to denote regulatory intervention before the market has suffered (anticompetitive) harm and the latter – intervention thereafter.

²⁹ In contrast, structural regulation aims to solve competition issues at a higher level of abstraction by targeting the underlying market structure which poses a threat to competition.

³⁰ See Section 2.3.

³¹ See Section 3.1.

³² Note that regulation mandating interoperability would likely require auxiliary rules to prevent similar anticompetitive techniques such as self-preferencing.

³³ In the case of digital advertising markets, a thriving market for non-integrated digital ad networks already exists, which suggests that entry by both new and existing firms is likely in the event of marketization. UK Competition and Markets Authority (2020). Online Platforms and Digital Advertising Market Study Final Report. Competition and Markets Authority (Appendix C).

³⁴ Vertical interoperability is defined as "the interoperability of a product, service or platform with complementary products and services." Kerber W, Schweitzer H (2017) Interoperability in the Digital Economy. *Journal of Intellectual Property Information Technology and Electronic Commerce Law* 8, 39.

³⁵ The separation of M from P makes the system more modular, allowing consumers more discretion in how they consume and enabling them to "create end products that perform functions more closely suited to their idiosyncratic needs." Schilling MA (2000) Toward a General Modular Systems Theory and its Application to Interfirm Product Modularity. *Academy of Management Review* 25(2), 312-334.

³⁶ 'Raw material' could be C_p 's consent to be monetized or access to their data stored by P_i , etc.

³⁷ If the new monetization firm does not make enough profit to cover C_p 's costs, it could absorb the difference as a loss, or require C_p to pay the difference.

³⁸ Note that regulation to ensure C_p can easily switch between products in M could be warranted here. This is known as horizontal interoperability, the benefits of which are described in the Stigler Report and are a key recommendation of the UK's CMA report. See Stigler Committee on Digital Platforms (2019) Committee on Digital Platforms Final Report. Chicago Booth Stigler Centre for the Study of the Economy and the State and UK Competition and Markets Authority (2020). Online Platforms and Digital Advertising: Market Study Final Report. Competition and Markets Authority.

³⁹ Hereby we assume the standard of an 'aware consumer', which the European Commission works with. Wilhelmsson T (2004) The Abuse of The "Confident Consumer" as a Justification for EC Consumer Law. *Journal of Consumer Policy* 27(3), 317-337.

⁴⁰ For example, if the end-user C_p switched advertising providers for their social network, the social network would simply request adverts from the new provider instead of the old one. The new advertising provider could request the data on the consumer from the social network to better target the ads.

⁴¹ In this case, C_p could either choose to make up the difference, or would be deterred from consuming P_i , since they must bear the extra costs. An interesting corollary is that lack of consumer payment for many online services contributes to the high number of spam users and 'bots' that characterize many services today. In a post-marketized environment, firms in M would likely be able to generate far less revenue from bots, and would be less willing to serve them. Thus, such low-quality 'consumers' could have to pay for their usage of products in P , increasing the cost of nuisance actions.

⁴² Application Programming Interfaces (APIs) are a mechanism for allowing digital services to interact with other digital services, and thus offer access to key data and functionality of a service in order to unlock downstream markets.

⁴³ Integration between different firms using an API to achieve real-time access to data is a standard practice in technology markets as explained in the CMA report.

⁴⁴ The entry into force of Regulation 1/2003 in May 2004 marked the beginning of a 'more economic' or 'effects-based' approach to competition enforcement in the EU.

⁴⁵ The provisions of Article 5 DMA are 'stronger' than those of Article 6 because the former are non-negotiable and the latter are. Still, please note that Article 6e also prevents anticompetitive vertical integration, though is specific to operating systems.

⁴⁶ Making the case for structural remedies under competition law is not frivolous. In particular, one needs to show that the remedy envisioned can adequately address the harmful behavior in question.

⁴⁷ The only way that C_p can use P_i is also by using M_i so that P_i is forcing consumers into a contract with M_i .