Ilmenau University of Technology
Institute of Economics

Ilmenau Economics Discussion Papers, Vol. 29, No. 189

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Oliver Budzinski & Annika Stöhr

May 2024

Institute of Economics
Ehrenbergstraße 29
Ernst-Abbe-Zentrum
D-98693 Ilmenau
Phone 03677/69-4030
Fax 03677/69-4203

ISSN 0949-3859

https://www.tu-ilmenau.de/iedp

Perfect Competition, Market Power, and Contestability

Oliver Budzinski & *Annika Stöhr*[*]

Abstract: The model of perfect competition is one of the most famous, most important, and most misunderstood concepts in economics. Rather than aiming to be a full-blown model of real-world competitive markets, the perfect competition model isolates the decentralized coordination mechanism inherent in all competitive markets. Coordinating supply and demand is not the only feature of market competition, but it plays a central role regarding to its virtues, and understanding the working mechanism of this coordination is valuable for economic thinking and economic theory. However, the implications of the perfect competition model for competition law and policy are limited.

Market power is a multifaceted phenomenon that consists of several distinguishable types. This contribution explains absolute market power (single-firm monopoly and dominance), collective market power, relative market power, and systemic market power. Due to the possibility of merit-driven paths to market power positions (especially disruptive innovations), market power is difficult to prohibit – despite its welfare-reducing effects within the affected markets (anticompetitive effects) and in other parts of the economy and society (rent-seeking, lobbying, distributional issues). Therefore, competition policy usually focuses on preventing non-merit paths to market power (merger control) and on combating the (anticompetitive) abuse of market power.

Contestability refers to the openness of markets. More specifically, it is the ability of companies to overcome barriers to entry and exit as well as to expansion on markets. While the original economic theory of contestability defines very strict conditions for perfectly contestable markets, antitrust has employed the term contestability in broader and in varying ways, emphasizing the role of potential competition and potential market entries to discipline the behavior of powerful incumbents on monopoly or dominance markets. Recently, contestability is rising to new prominence as a major goal of the European regulation of digital ecosystems.

Keywords: perfect competition, atomistic competition, coordination of supply and demand, market power, monopoly, market concentration, dominance, digital ecosystems, price setting, economic power, contestability, entry barriers, exit barriers, potential competition, open markets, Digital Markets Act (EU)

JEL-Codes: A10, A20, B10, B20, D00, K21, L12, L13, L40

[*] Prof. Dr. Oliver Budzinski and Dr. Annika Stöhr, Economic Theory Group, Ilmenau University of Technology, Germany, emails: oliver.budzinski@tu-ilmenau.de and annika.stoehr@tu-ilmenau.de. This paper comprises three contributions written for an encyclopaedia of competition law which will contain modified and revised versions.

A. Perfect Competition

I. Introduction

The model of perfect competition (also called atomistic competition; technically the market structure of a homogeneous polypoly) is one of the most famous, most important, and most misunderstood concepts of economics. It is not a model that aims to provide an empirically-supported, realistic model of competitive markets as a whole. Instead, it isolates a specific element of competition – namely its decentralized coordination function – that cannot be observed without the virtues of an abstract model, excluding everything that overshadows the pure coordination effect in real-world markets. As such, its far-reaching – and often criticized as being unrealistic – assumptions deliberately remove many elements of reality in order to make visible what would otherwise remain buried under the complexity of reality. In doing so, it stands in line with Robinson's (1973: 54) famous metaphor of the useless character of a roadmap in the scale of 1:1, the only roadmap that does not simplify reality and excludes relevant features of the real-world.

Thus, the importance and the usefulness of the model of perfect competition exactly originates from its "unrealistic" assumptions, revealing a mechanism that does not meet the eye without sound modelling. Obviously, this also implies that the use of the perfect competition model for analysing real-world markets – which predominantly show up in some form of oligopoly, displaying strategic interdependency between the competitors – is limited (see section III). It certainly does not fit as a paragon or role-model for real-world markets in the sense that they should be as similar to perfect competition as possible. This, indeed, would lead to eroding most of what characterizes competitive processes in real-world markets (Hayek 1948). Therefore, perfect competition cannot be the goal of antitrust law and policy as well. It is neither a sound general description of competitive markets nor a useful goal for economic policy. Nevertheless, the model of perfect competition is an important milestone in economic theory and paramount for our understanding of market processes.

II. The Model in Historical Context

II.1 The Invisible Hand …

The virtues of competition are manifold. Many of them are incentive-based and dynamic at heart: competition provides incentives for companies (i) to provide better and new products and technologies, (ii) to invest in more efficient ways of production, (iii) to follow the (changing)

preferences of consumers (for instance, producing vegan food when more and more consumers demand so), and (iv) actively find new solutions to get the economy going again in times of economic crisis. These effects of competition are commonly emphasized since Adam Smith (1776) and have been supported by empirical analyses again and again.

However, there is another element to Smith's (1776) virtue of competitive markets: if all market participants seek their own good, then the market, "like an invisible hand", transforms these actions into social welfare. This aspect – allocative efficiency – immediately became one of the most controversial elements of the economic theory of markets. First of all, it was revolutionary in comparison with the prevailing view of society at the time of its first publication: while feudalism sees the right to exist of the common man in his function to increase the wealth of his ruler (be it a king, a prince, a count, a baron, a representative of a church, or any other ruling clique), the market economy paradigm emphasizes methodological individualism as its foundation: the right of every individual to live for his own good. This is a normative statement.

Second, this element is often associated with providing a justification for egoistic, maximize-wins-at-all-costs, reckless behaviour. The second criticism misunderstands that utility and preferences are inherently subjective concepts, and include other-regarding preferences and altruistic motives just as much as any other motivation. As such, at its heart, it is a positive theory rather than a normative statement: presented with two alternatives, individuals will choose the one which best fits their preferences and (tends to) maximizes their utility.[1] What these preferences are and how egoistic/altruistic, self-/other-regarding, calculating/emotional they are, is not the subject of economic theory, and the logic of market economics works irrespective of the distribution of self-/other-regarding preferences in society. Adam Smith himself was a moral philosopher and far away from disregarding the value of moral rules and sentiments (Smith 1759).

[1] Utility maximization is another often misunderstood concept in economics. It postulates that individuals, when faced with a choice will choose the alternative that they believe will give them the higher utility. As such, they attempt to maximize their utility (without always achieving this). Note that notions of hyper-rationality and error-free choices in this context rely on the assumption of perfect information. Under more realistic assumptions of imperfect and distorted information, individuals make "mistakes" in trying to maximize their utility because they assess some of the choice options incorrectly (and do not even know about others). Nevertheless, they choose what they believe to be the better option if they act (subjectively) rationally. Empirical evidence supports that individuals act subjectively rational in the majority (but not all) of their choice situations. Note that economic theory also includes that limited cognitive capacities imply that "routine" decisions are made according to a "satisfying" standard (i.e., if the utility level exceeds certain thresholds, individuals do not actively search for even better options), whereas "non-routine" decisions are usually attempt to actually maximize utility (without necessarily succeeding).

The virtue of Smith's invisible hand is that coordination emerges in the competitive market process without (i) any individual seeking to contribute to coordination and (ii) any centralized authority providing coordination. Instead, the decentralized interaction of individuals on markets under competition produces coordination of supply and demand in a decentralized, self-organizing way. This core idea of market economies arouses to scepticism of anyone who desires to centrally plan and organize the economy, whether from the perspective of a king, a ruling party (left or right), an engineering expert trained in relying on centralized solutions, or an autocratic regime that wants to have everything under control, or anyone else. While Smith (1776) understands the process on an intuitive level – hence, the "invisible hand" – the economists of the nineteenth century sought to make the invisible hand visible and provide an explanation for the decentralized, self-organizing coordination force of competitive markets. Following the paragon of "modern science" of those times, adapting a Newton-style framework of a balance (or equilibrium) of forces in a (stationary) mathematical model was the preferred choice for modelling.

II.2 … Made Visible

Continuing pioneering work by Augustin Cournot, Edgeworth (1881) provided the first attempt for a rigorous and systematic definition of perfect competition (Stigler 1957: 6; 1987). Adding developments championed by, inter alia, Léon Walras and Irving Fisher, Clark (1899) finally brings together the assumption of a stationary equilibrium (for analytical purposes, not as an empirical statement) with competition as a coordination mechanism of supply and demand. According to Stigler (1957: 11), the final formulation of perfect competition should be ascribed to Knight (1921), who refined the underlying knowledge assumptions. The purpose of the assumptions is to remove any real-world factor that distracts from or overshadows the pure coordination mechanism of competition. In other words, anything that causes shifts in the supply and demand curves (represented as quantity (Q) as a function of price (p); Q(p)) is excluded by the assumptions, so that purely (and in that sense "perfectly") the movements along the supply and the demand curves determine the model. For the purpose of the abstract model, it is necessary that the supply and the demand curves in the price-quantity depiction are stable and do not shift.

Consequently, the following assumptions are usually listed to be necessary for deriving the abstract model of perfect competition:

- The number of sellers and buyers must each be so large that no single seller or buyer can influence the market price by their individual and non-coordinated actions. Thus, each market participant acts as a price-taker. Note that this does not require an infinite number of sellers and buyers. Instead, it is "only" necessary that each seller and buyer be sufficiently small so that no individual power to influence the market conditions is possible. – This assumption essentially rules out strategic interdependency through direct rivalry, which is common in real-world markets. Individual opportunities to influence the price by applying business strategies (such as innovation, pricing strategies, product differentiation, marketing, etc.) "disturb" the pure coordination mechanism in the short run by leading to shifts and/or changes in the slope of the supply curves.
- Goods are homogenous, so that buyers have no preferences about which seller to buy from. Products within a market are therefore perfect substitutes for each other. In reality, only few goods are homogenous, mostly raw materials or strictly standardized goods. However, heterogeneous goods lead to deviations from the law of one price within one and the same market and are closely interrelated to strategic business actions. Supplier-specific preferences, such as brand preferences or preferences for specific product variations, are natural in real-world competition but imply shifts in the demand curve. An important implication of homogenous goods is that buyers strictly choose the cheapest product and do not select according to other criteria. This leads to a single market price. In contrast, markets with heterogeneous goods display several prices because some buyers are willing to pay more for a certain brand or a special feature of the good, etc., and buy the more expensive good, while others are not and switch to the cheaper one.
- All market participants are assumed to behave rationally to maximize their utility (profits in the case of sellers). – While often subject to criticism, this assumption is largely content with empirical analyses. Rational behaviour implies the congruence of mind and action, i.e., sellers and buyers choose the option that they believe is the best one for them. What is "best" is determined by the individual's preferences – which may be self- or other-regarding or all kinds of things (see section I.1). Depending on the assumptions about information and knowledge, this assumption may be rather unrestrictive (rationality with subjective information may include all kinds of behavioural "mistakes" and "anomalies"). Therefore, the next assumption is crucial in this context.

- The assumption of perfect information implies that each seller and each buyer is perfectly informed about everything relevant in that market. Together with the assumption of rational behaviour, perfect information implies that sellers and buyers choose the "right" option to maximize their utility. – In reality, information is incomplete (bounded rationality; Simon 1955) and qualitatively distorted (subjective information and exploitable information asymmetries; Kahneman 2003a, b; Denzau & North 1994; as well as Arrow 1963, respectively). This, however, creates the opacity of real-world markets and overshadows the coordination mechanism by creating new coordination needs.
- Zero transaction costs (including costs of geography) and no costs of market entry and exit are assumed. – Again, this assumption avoids changes in the supply and demand curve due to these factors.
- Similarly, the absence of externalities as well as supply-side or demand-side size effects (including economies of scale and scope as well as network effects) is assumed. – Such phenomena imply that suppliers or buyers gain (limited) influence over the price.
- No government intervention other than well-defined and perfectly enforced property rights as well as antitrust policy eliminating inter-seller and inter-buyer collusion. – While perfectly functioning property rights are a relevant precondition for smooth market exchange, and while antitrust policy safeguards the price-taker restriction, any further government intervention would change the conditions for supply and demand and thus create new coordination needs.

Note again that these restrictive assumptions are not set because economists believe that they mirror reality. On the contrary, they serve to exclude anything that overshadows the pure coordination mechanism of competitive markets, so they only make sense if they exclude phenomena that are relevant in real-world markets. It is not possible to exactly define the minimum necessary conditions precisely because several of the assumptions interact and the necessity of some depends on the narrow or broad definition of others (Stigler 1957, 1987).

What remains after the long and ambitious list of assumptions is a market in which the behaviour of suppliers can be represented by a stable linear supply curve and the behaviour of buyers by a stable linear demand curve with opposite signs of the slopes, yielding a single equilibrium at the intersection of the two curves. This equilibrium satisfies two conditions:

(1) Whatever price this market starts with, suppliers and buyers experience incentives to change their individual supply and demand plans in the direction of the equilibrium.

However, they do not move in the "right" direction because they intend to contribute to coordination. Instead, they only act to maximize their individual utility. For instance, a price above the equilibrium price causes demand to be lower than supply. Thus, a number of suppliers cannot find buyers for their goods, and they experience incentives to reduce the price (in order to sell the products that did not find buyers, and thus maximize their profits in this given situation) and/or to reduce the number of products they put on the market (in order to avoid being stuck with unsold products, again for profit-maximizing reasons). A decreasing price implies that some buyers who found the original price to be "too high"[2] will now reverse their decision and want to buy, thus contributing to an increase in demand. In other words, supply and demand move towards each other, thus resulting in coordination. The incentives for suppliers and buyers remain the same until all products that suppliers put on the market are sold (equilibrium). Conversely, if the initial price is below the equilibrium price, demand exceeds supply (because only low-cost production is profitable at a very low price). Now, buyers who want to buy but do not get one of the scarce products have an incentive to outbid other buyers (since their utility is maximized by getting a good at an incrementally higher price than not getting the product at all), thus raising prices as sellers want to maximize their profits and sell to the highest bidders. The increasing price changes the individual supply and demand plans, so that some buyers stop buying because the good is now "too expensive"[3] for them, and at the same time sellers with higher costs find it profitable to bring additional products to the market. Thus, demand decreases and supply increases, coordinating supply and demand towards each other. Again, the incentives remain the same until the equilibrium is reached.

(2) At the equilibrium price, demand and supply meet quantity-wise and market participants have no incentive anymore to change their behaviour. The equilibrium is stable.

Thus, the abstract model makes Smith's invisible hand visible: although all market participants seek to maximize their individual utility, coordination occurs in the sense that supply and demand move towards each other. This happens in a decentralized way (through incentives to change the individual supply and demand plans), and without anyone being aware that they are contributing to market coordination – or anyone being required to want/intend to contribute to coordination.

[2] In economic terms: the price is higher than the marginal utility of buying the (next unit of the) product in question. The marginal utility derives from the subjective preferences of each buyer and differs among them.
[3] Again, this refers to the price-marginal-cost relation (see preceding footnote).

In the real world, where all the restrictive assumptions of the perfect competition model do not hold, a multitude of permanent and de-coordinating forces affect markets, driving supply and demand away from each other. Competitive markets, however, possess an underlying mechanism that pushes supply and demand towards each other, thus preventing the system from exploding in the sense of ever-increasing unsatisfied demand or ever-increasing excess supply. The market-internal coordination mechanism probably never reaches equilibrium due to all the permanent forces with de-coordinating effects – but there is always an inherent tendency to bring supply and demand back together.

It is the virtue of the concept of perfect competition to identify Smith's invisible hand and to isolate the market-internal coordination function of competitive markets in the face of permanent de-coordinating forces. It is thus important for understanding the allocative welfare of competition. However, its empirical application is obviously limited by its high degree of abstraction. In other words, no real-world market mirrors the model of perfect competition, although they all possess this inherent coordinating force as long as competition works. Nevertheless, it remains somewhat uncomfortable that a snapshot of a stationary model of the economy represents something that is inherently a dynamic coordination mechanism, causing some of the problems and misunderstandings with this landmark economic model.

III. Applicability and Interpretation

III.1 Problematic Applications

It should be clear from the very nature of the concept of perfect competition that it is not applicable to real-world markets, either as an ideal or as a goal, paragon, or empirical model for real-world competition policy. The idea that perfect competition represents ideal markets in some normative sense, and that real markets "suffer" from imperfections that reduce their workability, may – in part – stem from the notion of "perfect" in naming what is technically a homogenous polypoly market structure. However, many of the phenomena that are excluded by the assumptions of the perfect competition model are integral parts of competition and important for its virtues. These include, for example, the dynamic aspects of competition such as incentives to innovate, strategic interdependency between rival firms, etc. Their existence does not make competition "imperfect" in the sense that it works worse or functions less well. On the contrary, competition unfolds its full benefits for society only as a dynamic process (inter alia, Hayek 1948, 1968; Petit & Teece 2021; Kerber 2023) of innovation and imitation (Clark 1961). It would be strange to describe dynamic competition in innovative markets as

"imperfect" in any sense of being inferior. The same holds for the natural aspects of everyday markets, such as imperfect information, heterogeneous goods, positive transaction costs and costs of geography, etc. These are all regular elements of competition. The term "perfect" refers to the isolation of the decentralized coordination mechanism (the visibility of the invisible hand) and does not carry any normative meaning (in the sense of being superior, better, desirable, etc.).

Equally problematic is the widespread use of the perfect competition model as a theoretical benchmark concept in other areas of economic policy. "Perfect competition is a theoretical benchmark concept in economics that results in the achievement, in the long run, of maximum efficiency, and is used as the basis against which to measure market performance for other theoretical and real-world market structures and other economic concepts" (Pleatsikas 2018: p.1). For the same reasons that perfect competition cannot be a goal of competition policy, it cannot serve as a benchmark for evaluating market performance or economic policy interventions. The – unfortunately widespread – idea that real-world markets can be evaluated according to their deviation and distance from perfect competition (Pleatsikas 2018: p. 3) is problematic, since these "deviations" are inherent elements of dynamic competition and integral to the sense, meaning, and virtues of competition (Hayek 1948, 1968). Nevertheless, to this day, many macroeconomic models in particular rely on the assumption of perfect competition in the underlying markets, which is understandable for reasons of (mathematical) feasibility, but creates problems in terms of empirical soundness.

III.2 Modern Meaning and Legacy

Understanding competition as a process of dynamic strategic interdependency among rival competitors that creates incentives to innovate and imitate implies valuing the virtue of the concept of perfect competition. Its core implication is that the coordinating power of competition must not be distorted or blocked by regulatory or political intervention. The coordination of supply and demand is a task that must be solved by any economic system that provides welfare to its citizens. And since there is currently no alternative coordination mechanism with a similar coordinating power as competition (see also the following paragraph), the preservation of effective competition is an important goal – naturally for antitrust policy, but also for economic policy in general. Economic policy interventions can create *economic* benefits for society only if they address market failures, i.e., situations in which the coordination function of the market is distorted (such as in the case of extreme positive externalities (so-called public goods), collusion- or dominance-based resolution of competition,

natural monopolies (subadditivity of costs on markets with homogeneous goods), and very strong and abuse-prone asymmetric information or externalities). They can only create other *social* benefits if they change the institutional framework of markets without distorting the coordination power of competition. Similarly, competition policy may successfully pursue goals other than the protection of competition only if and insofar as the coordinating power of competition remains effective.

An important legacy related to perfect competition as an abstract model to visualize the coordination function of competition is the proof that the decentralized character of competitive coordination cannot be replaced by centralized systems of coordination (Hayek 1945). Irrespective of information processing capacities, the relevant knowledge to coordinate supply and demand cannot be obtained in a centralized way. The reason lies in the individual changes in supply and demand plans in response to perceived market conditions and the other market side (see section II.2). Individual plans are changed because expectations about prices, quantities, and other elements of competition have not been met, and new best options adapted to the changing environment are developed by the market participants. And the latter is crucial: market participants do not start with a complete and determined set of individual supply and demand plans for all circumstances, instead they only *create* new solutions when it is necessary – new options that they themselves did not even know about in advance. This knowledge cannot be collected in any centralized way because it is created only in the decentralized process of competitive interaction and does not exist beforehand or otherwise.

Finally, there is a legacy of the perfect competition model that relates to theory building in economics. It represents an important component and prerequisite for demonstrating at the macroeconomic level that an economy, in a purely theory state, can be in a general equilibrium (although this is extremely unlikely to ever happen). The possibility of an economy-wide equilibrium was first demonstrated in the nineteenth century by Léon Walras, whose model still required a circumvention around the decentralized coordination mechanism in the form of an omnipotent auctioneer. In the 1950s, however, Kenneth Arrow and Gérard Debreu managed to prove the possibility and stability of a general equilibrium (Arrow & Debreu 1954). This insight is highly relevant for economic theory building, especially in macroeconomics.

IV. Conclusion

The abstract model of perfect competition is a seminal landmark contribution to economic theory. It isolates the coordination mechanism underlying competitive markets and visualizes

how individual utility-maximizing action contributes to the coordination of supply and demand. It is not, however, an empirical model of real-world competition. Although all markets with effective competition inherently contain the perfect competition element in their power to provide a decentralized coordination of supply and demand, real-world competition processes are much more than this and cannot be described in their effects and dynamics by the abstract model. Important elements of dynamic competition are excluded by assumption in the model of perfect competition, such as the interplay of innovation and imitation incentives, the strategic dependency among rival competitors, etc.

Thus, it is important to understand that the "perfect" in the abstract model of perfect competition has no normative meaning in the sense of being "better", "superior" or "desirable". Therefore, perfect competition is not suited to serve as a goal for competition policy or as a benchmark for evaluating competition, markets, or regulatory interventions. To the extent that the term is misleading, the term "perfect" competition may not be perfectly well chosen – but it has evolved historically. In sum, while the abstract model of perfect competition is of paramount importance for economic theory, it has very little to offer for antitrust analysis, policy, and law – except the important understanding that coordination of supply and demand is necessary for social welfare, and that competition provides the best mechanism – according to current knowledge – for this permanent coordination task.

B. Market Power

I. Introduction

In competitive markets, firms face two restrictions to their market behaviour: (i) the demand restriction, which implies that some customers will stop buying when the price increases (or the quality decreases at the same price), and (ii) the competition restriction. The latter refers to the fundamental situation of strategic interdependence in competition. The effects of a strategy (or any market action) by a firm in a competitive market depend significantly on how the competitors react to that strategy/action. While the demand restriction highlights the role of marginal utility in determining the willingness-to-pay of customers and, thus, is customer preference driven, the competition restriction emphasises the oligopolistic character of (real-world) market competition. Market power relates to the relaxation of the second restriction, the competition restriction, which implies that a powerful firm is able to act independently of its competitors to a certain extend. Maximal market power is associated with an incontestable monopoly, where no (actual or potential) competitor can influence the behaviour of the

monopolist. Note that even monopolists are still subject to the demand restriction and the elasticity of demand (more precisely, the own-price elasticity) influences the extent of market power. A high elasticity of demand (implying that a significant number of customers stop buying when the price increases) limits the profitable exercise of market power in contrast to inelastic demand (implying that only few customers stop buying when the price increases). Consequently, a comprehensive assessment of market power requires a dynamic assessment that incorporates the dynamics of the firm's behaviour and the evolution of the market (Bishop & Walker 2009). Additionally, a sole focus on price-setting power does not sufficiently capture the notion of market power. Rather, factors such as product quality or investments in innovation must also be taken into account – particularly in the context of a dynamic view of competition and market power.

Market power is a multifaceted construct, encompassing both legal and economic elements and can be referred to as "the most important determinant of liability in competition law" (Kaplow 2017: 1304), since preventing the creation and exploitation of undue market power can be seen as the overall objective of antitrust policy (Krattenmaker et al. 1987). Its assessment, approached through this multidisciplinary lens, has ambivalent implications. On the one hand, the acquisition of market power may be indicative of a firm's efficiency and competitive advantages. On the other hand, it opens avenues for potential exploitation and abuse of this dominant market position, and is associated with various negative effects on social welfare.

II. Types and Measurement of Market Power

II.1. Economic Theory: Types of Market Power

The above-mentioned multi-faceted character of market power as a phenomenon and the various potential effects of its (ab-)use, necessitates an initial overview of the various types of market power (II.1) and an examination of the methods employed by regulatory bodies and practitioners to assess it (II.2).

Monopoly and Single-firm Dominance

According to definition, a monopoly is a market situation where a specific good is exclusively supplied by a single firm, thereby conferring upon that firm a market share of 100 percent. Monopolistic market power is not restricted by competitors anymore, especially if the monopoly is incontestable, i.e., protected by prohibitive market barriers that prevent any other firm from entering the market. In general, an unchallenged *monopolistic* firm represents the

pinnacle of market power attainment. In the real world, pure monopolies are rarely observed without artificial protection by the government or other authorities.

Nevertheless, a firm may enjoy a very high market share, which allows it to act mostly independent from its competitors. This firm then may then be able to behave like a monopolist, for instance setting prices that are close to those dictated by a monopolistic firm (*quasi-monopoly*) (Krattenmaker et al. 1987; Motta 2004). For example, during the 2010s and 2020s, Google Search enjoys a market share of over 90 percent in some European and North American markets. Although this firms is not a perfect monopoly, it is dominant in the market and is able to exploit significant market power. Such circumstances are typically referred to as single-firm dominance or market dominance. The objective is to identify instances where a single firm does not face a relevant competition restriction anymore, thereby enabling it to act independently of the reactions of the remaining firms in the market. Although market power is often correlated with market share, this interrelation is not perfect. Therefore, it is impossible to scientifically determine a specific market share threshold that unambiguously delineates market power in terms of dominance from effective/workable competition. For example, a firm with a 60 percent market share may be considered dominant or not depending on various factors, including the size of the next largest competitors, their capacity to increase supply, their competencies to grow, their innovation competence, their financial situation (many of the listed factors in relation to the corresponding competencies of the dominant firm), the market characteristics, etc. Even a firm with less than 50 percent market share may exert market power if it is the only large firm facing numerous small firms without growth potential. On the other hand, even high market shares may not be indicative of high market power if the demand is highly elastic or if competitors possess strong innovation and growth potential.

Different to a monopolist, a dominant firm exerts a discernible influence on the market, evidenced by its capacity to establish prices independently, thereby marginalising the influence of competing firms within the market (*competitive fringe*). Conversely, these fringe firms often operate as price-takers, lacking significant pricing autonomy. This distinction from monopoly is further emphasised by the focus on the relatively substantial market share of a dominant firm in contrast to the marginal presence of fringe firms. This conceptualisation is in close alignment with the legal definition of dominance, which denotes a firm's preeminent standing within the market landscape (Këllezi 2008; Carlton & Perloff 2015). Many competition laws define a market share threshold for the conjecture of market power in competition policy investigations. In the EU, for instance, a market share below 40 percent is indicative of the absence of market

power, whereas a market share above 40 percent suggests the possibility of market power, which must then be further substantiated and established in the competition policy proceedings. From an economic perspective, this threshold appears somewhat arbitrary and cannot be derived from economic theory. Nevertheless, it has proven to be quite workable in competition law practice.

Collective Dominance

In addition to the phenomenon of single-firm dominance, firms can *collectively* hold and exercise market power. This can be achieved through forms of coordination such as keeping prices above competitive levels, limiting production, or dividing the geographical market (European Commission 2004, para. 40), thereby creating tacit collusion-like equilibria. This may occur particularly in narrow oligopolistic markets, where a limited number of operators possess the capability to monitor each other's competitive conduct, goods (or assortments/ranges of goods) are relatively homogeneous, and innovation dynamics as well as the spirit of competition (Hoppmann 1968) are low. The behaviour of collectively dominant firms may closely resemble that of a single dominant entity or a cartel. Both Article 102 of the Treaty on the Functioning of the European Union (TFEU) and the EU Merger Regulation (and the associated guidelines) address the notion of *collective dominance*. However, cases involving collective dominance predominantly arise within the framework of merger control rather than abuse of dominance (Lovdahl Gormsen 2024).

Relative Market Power and Countervailing Powers

Firms that do not hold a dominant position but exert significant influence over their business partners within certain market contexts can be described as firms with *relative market power* or *superior bargaining power*. This especially applies to markets with a limited number of (close) substitutes or high switching costs, where alternative options for transacting with third-party entities are deemed insufficient or not reasonable, leading to a kind of *economic dependence* (Moussis & Yamada 2024; Bougette et al. 2019). Another example of this phenomenon is multi-sided markets, where the services provided by a platform are essential to the operations of other firms reliant upon their intermediary functions. In such instances, the intermediary firm exerts considerable power over the interactions and transactions facilitated through its platform.

Furthermore, dependency may arise from disparities in data control (Graef 2015). This occurs when one company controls access to essential data that another firm requires to conduct its own operations effectively, and this data cannot be reproduced or collected again. In such

instances, the controlling entity is able to exercise market power due to its control over critical data resources, which are essential for the functioning of dependent firms. These firms wield influence disproportionate to their market share, and in the absence of a dominant position (OECD 2022).

Relative market power is often contingent upon the absence of countervailing powers, i.e., on the ability of dependent parties to organize themselves in a manner that creates a similar power. For example, firms that depend on a digital marketplace could form alliances to establish a countervailing power and enforce fair contractual conditions. However, this may further erode competition in the respective market and may violate antitrust rules against cartel formation.

Systemic Market Power

Another specific type of market power, which occurs particularly on digital platform markets and within digital ecosystems, can be referred to as *systemic market power*. This represents a fourth form of market power, alongside relative, absolute, and collective market power. In determining the market power of ecosystem firms, for instance, it is necessary to consider their power as intermediaries and rule makers (Schweitzer et al. 2018). This power arises from the interdependencies between the products and services offered, which are consciously internalised by the firms. Examples of such market power include digital marketplaces (for general goods or such for specific goods like app stores or platforms/services for audiovisual content) and market-internal governing bodies in professional sports markets.

In order to prevent abuse, it is not sufficient to only consider the conditions of competition in narrowly defined markets. Beyond that, the economic power arising from broader, cross-market interoperabilities, interconnections and interdependencies, often combining horizontal, vertical, and conglomerate conduct and arrangements, needs to be taken into account (Budzinski & Stöhr 2024). Dealing with systemic market power has not been at the core of antitrust policy in most competition regimes until the 2020s.

(Ab-) Use of Market Power

Firms that possess any type of market power can use it to implement a multitude of profit-maximising conduct and practices, including, inter alia, raising prices, decreasing quality, slowing down innovation, implementing and raising market (entry) barriers, segmenting markets and customer groups, enforcing unfavourable conditions up- and downstream, etc. Market power reduces the incentives for firms to provide allocative efficiency and to strive for

dynamic efficiency. If they behave incentive-driven, both is reducing social welfare. Empirically, one of the benefits for a firm holding market power is that it can enjoy a quiet life (Hicks 1935). This emphasises the dynamic disadvantages, which include – next to significantly lower innovation dynamics – decreasing cost efficiency over time, inter alia, through increasing X-inefficiencies.

All types of market power are elements of economic power, which is also associated with negative effects on society. Firms with market power are incentivised to focus their strengths and creativity on maintaining their market power, rather than investing in competition on the merits (i.e., improving their goods). Market power leads to rent-seeking and lobbying (Tollison 1982, 2012), particularly when the market power is already supported by some political privilege. Granting one privilege is often followed by the request for the next privilege by the privileged firms (Eucken 1952: 335-336; Vanberg 1999). Furthermore, market power, as an element of economic power, contributes to an increasing inequality of income and wealth within a society. Newer research has also highlighted that market power strengthens the power of firms on labour markets at the expense of workers and employees (inter alia, Shapiro 2019).

II.2 Empirical Economics: Measuring Market Power

The assessment of market power is of significant importance for antitrust legislation, which endeavours to safeguard competitive markets and mitigate the potential abuse of market dominance, whether by a singular monopolistic entity or by a group of colluding or cooperating firms. “The standard method of proving market power in antitrust cases involves first defining a relevant market in which to compute the defendant's market share, next computing that share, and then deciding whether it is large enough to support an inference of the required degree of market power.” (Landes & Posner 1981: 938). In order to ascertain the presence and extent of market power, antitrust practices frequently use indicators such as market share and market concentration. In a functioning market, a firm with a substantial market share is commonly perceived as possessing market power (as a rebuttable presumption) and an industry with significant concentration is often deemed susceptible to collective manifestations of market power. Furthermore, metrics such as markup ratios or profit margins are frequently incorporated into this evaluative framework (Baker & Bresnahan 1992; Kaplow 2015).

Following the market definition, there are several measures used to assess market power. The standard measure of monopoly power is the so-called Lerner Index, developed by Abba Lerner in a 1934 seminal paper (Lerner 1934). To identify the “degree of monopoly”, Lerner used the

difference between the firm's price and its marginal cost at the profit-maximising rate of output ($(P - MC)/P$), a greater wedge between price and marginal cost meaning greater monopoly power. By using the relationship between price and marginal cost rather than average cost, the Lerner Index focuses on the allocative inefficiency created trough monopoly power and the pursuit of monopoly rents (Lerner 1934; Elzinga & Mills 2011). One significant drawback of the index is that it fails to acknowledge instances where deviations in price from marginal costs may be driven by efficiency gains or the necessity for firms to cover fixed costs. Consequently, it is erroneous to ascribe all of these deviations to the exercise of monopoly power (Lindenberg & Ross 1981). As *perfect competition* (see section A) is used here as a benchmark, the aforementioned limitation is of considerable relevance, given that only few if any firms and markets fit the assumptions of this model (Elzinga & Mills 1981).

Another measure of market power through market concentration is the Herfindahl-Hirschman-Index (HHI). The HHI is employed in merger control proceedings and in antitrust litigation to assess the potential for market power and to create so-called safe harbours for cases that are deemed to be unproblematic (e.g., in block exemption regulations for horizontal and vertical agreements). It puts the size of a firm in relation to the industry it operates in and is calculated by squaring the market share of each competing firm in the industry and summing up the resulting numbers, the market shares being expressed as fractions or points. The result is proportional to the average market share weighted by market share and can range from 0 to 1.0, moving from a large number of very small firms to a single monopolist. A low degree of concentration describes an industry where many firms of more or less equal size share the market among themselves. Increases in HHI generally indicate a decrease in competition intensity and an increase of market power, whereas decreases indicate the opposite (European Commission 2004, para. 16).

III. Emergence, Persistence, and Abuse of Market Power

III.1 Ways to obtain Market Power

Market power, in its various forms, can arise from three fundamental sources: (i) internal growth of firms, (ii) external growth of firms, and (iii) power privileges granted by the government and its authorities.

The term "internal growth" is used to describe the process by which firms expand and become significant players in their respective markets organically. It is based on the firms' own investments into higher capacities and their ability to sell higher volumes at the market. Usually,

the internal growth of firms is limited by competition. In a game of strategic interdependence, competitors react to unilateral growth strategies, preventing internal growth from reaching the level of market power. Exceptions may occur in two ways. Firstly, if a single firm is able to consistently meet the preferences of consumers in a given market more effectively than its competitors, its continued expansion of market share may gradually lead to market power. While this is not implausible for the origin of relative market power (see section II.1), it is highly unlikely for absolute power if no assisting protection from competition is accompanying the internal growth. This is especially true for markets with heterogeneous goods, where consumer/customer preferences diverge and, thus, different products are favoured by different consumers or customers. Conversely, if a homogeneous good is demanded by consumers/customers with homogeneous preferences, and additionally there is a subadditivity of costs at the market-level quantity of goods, then a natural monopoly will occur. This phenomenon is most prevalent in the context of physical network industries. Note, that even in the event of significantly decreasing total costs (due to the dominance of fixed costs over variable costs, as in the case of purely digital goods), a natural monopoly or absolute market power will not be reached if the goods and preferences are heterogeneous.

The second way of internal growth is more plausible. A firm may successfully establish a disruptive innovation, either by eliminating all of the previously existing products or by creating a whole new market. Consequently, this firm may now enjoy a degree of market power, which may be beneficial for society because the prospect of the accompanying profits increases the incentives to create, invest in, and establish radical innovations. Note, that investing in innovation is a high-risk business strategy with a high probability of failure. Thus, the post-innovation market power and the accompanying profits may be regarded as a risk-rewarding premium.

Secondly, firms may short-cut their growth process by acquiring or merging with another firm (external growth). By combining the assets of two or more firms, external growth works much quicker than internal growth, although it usually requires a greater initial investment. In contrast to internal growth, which typically has a gradual effect on competition (with the notable exception of specific disruptive innovations), external growth through horizontal mergers and acquisitions directly and immediately eliminates at least one competitor, thereby reducing the number of competitors (independent firms) in the respective market. Vertical integration through vertical mergers and acquisitions may result in bottlenecks along the supply chain, which could facilitate anticompetitive foreclosure and raising-rivals'-costs strategies. In

complex digital service markets, such as digital platforms and digital ecosystems, vertical integration sets incentives for anticompetitive strategies such as self-preferencing, selective withholding of business-relevant data, blackouts and foreclosure, abuse of economic dependence, price and condition discrimination, etc. Conglomerate mergers and acquisitions may generate economic power through the utilisation of superior financial means (cross-subsidisation, deep pocket threats, etc.). However, these are typically perceived to be less anticompetitive than horizontal and vertical mergers and acquisitions. Nevertheless, there is a growing awareness of the anticompetitive potential of vertical and conglomerate mergers and acquisitions in the context of the novel anticompetitive conduct and arrangements in digital ecosystems.

Thirdly, market power may originate from public protection of a specific firm. The most extreme scenario would be a monopoly privilege granted by the government, which would give one single firm the exclusive right to supply a certain good. Milder forms include state ownership, public liability for business debts and consequences, selective subsidies, asymmetric/selective regulations, discriminatory application of rules and regulations, institutional barriers to entry, tariff- and non-tariff-based barriers to international trade, further instruments of promoting "national champions" or similar concepts, etc. In addition to conferring market power vis-à-vis competitors without these privileges, these interventions set incentives for rent-seeking behaviour, i.e., firms re-allocating their investments and their creative forces away from improving goods and technologies and towards securing and enhancing privileges. This in turn encourages an increase in lobbying activity.

III.2 Prohibiting Market Power versus Combating its Abuse

Despite its negative effects on competition and social welfare, obtaining market power is not usually prohibited by competition law. The rationale for this market power privilege, which is conditional upon certain conditions, is twofold. Firstly, innovation monopolies or innovation-generated dominance can be beneficial for society. Disruptive innovations, such as the invention of electricity, automobiles, personal computers and smartphones, may propel societies on new levels of welfare despite the destruction of previously important industries, such as candlelight lamps, horse-drawn vehicles, typewriters, or traditional cell phones. Most societies do not want to opt out of such innovations in order to prevent subsequent market power. Secondly, if, for whatever reason, a sufficient number of competitors leave a certain market, leaving behind a firm that now obtains market power, it would be incongruous to "prohibit" this market power. Although infrequent, the latter may occur, for instance, in markets that are permanently in

decline or experiencing a significant reduction in size due to the good becoming more and more outdated.

Consequently, performance-based market power (resulting from competition on the merits) is generally accepted. Nevertheless, competition economists and legal scholars have long emphasised the importance of the contestability of merit-based dominance. It is only when other firms are able to – maybe with some delay – come back and challenge the (once) merit-based position of market power, thereby eroding the advantage of the market leader, that it is acceptable for a single firm to temporarily enjoy a dominant or monopoly-like position. In order to maintain a dynamic and competitive market structure, it is essential to preserve the interplay of creative, innovative forces (narrowing down market structure) and adaptive, imitating forces (broadening market structure again) (inter alia, Clark 1961; Kerber 2023). Neither can the (once) merit-based dominant firm be allowed to (ab-)use its power to prevent other firms from challenging its position, nor can it be welfare-increasing for the state to succumb to lobbying and to begin protecting the leading firm from future competition. Every conduct and every arrangement that results in the transformation of temporary, merit-based market power into persistent, anticompetitive market power harms social welfare – and granting firms the privilege to obtain market power (hopefully based on merit) is accompanied by a special responsibility to refrain from the abuse of their power in order to further erode competition.

As a result, most antitrust jurisdictions prohibit the abuse of market power, rather than prohibiting market power itself. To illustrate, in EU competition law, Art. 102 TFEU prohibits any abuse of a dominant position by one or more firms in the common market. This entails the rationale of conferring a market power privilege upon those who have achieved it through merit, while simultaneously imposing an accompanying special responsibility through the prohibition of all conduct and arrangements that further impede effective competition. This may also include an asymmetric treatment compared to non-powerful firms. Some strategies that are allowed for firms under competition may be prohibited for dominant firms because they effectively impede further competition in this market. Examples from EU antitrust law include discrimination between business partners or forced bundling/tying (Art. 102 TFEU). The German competition law (Gesetz gegen Wettbewerbsbeschränkungen; GWB), also includes a prohibition of the abuse of relative market power (§ 20 GWB) as well as a control of abusive behaviour of firms with paramount significance across markets (§ 19a GWB). This way, German competition law also addresses the issue of systemic market power (see II.1).

While abuse control addresses the issue of firms that legally grew into a market power position, merger control plays a complementary role. By prohibiting mergers and acquisitions that lead to a significant impediment of effective competition, especially through the creation or strengthening of a dominant market position, merger control limits the external growth of firms and thus aims to prevent the rise of (absolute) market power. In accordance with its more immediate and typically stronger concentration effect, external firm growth is thus treated differently from internal firm growth. While the former is limited by merger control, the latter is "only" supervised in combating its abuse, rather than its existence. Merger control and abuse control interplay with each other with the former seeking to prevent the emergence of (absolute) market power and the latter regulating the non-prevented cases of market power.

III.3 The Rise of Economic Power

Recent empirical studies based on data from North America and Europe and employing different methodologies have shown a significant rise in market power across various industries and markets throughout the last decades, accompanied by growing concentration and decreasing competition intensity (inter alia, Autor et al. 2017; Gutiérrez & Philippon 2018; Grullon et al. 2019; Autor et al. 2020; De Loecker et al. 2020; Affeldt et al. 2021; Bajgar et al. 2023; Koltay et al. 2023). In addition to the negative effects on the competition process and its virtues, the rise of economic power is also associated with related societal problems, including increasing spending on lobbying and growing rent-seeking (inter alia, Cowgill et al. 2023).

While the discussion on the causes for this development is just starting, it must be considered that the enforcement of competition policy instruments against market power may have been insufficient (inter alia, Budzinski 2010; Salop 2018; Shapiro 2019; Valletti & Zenger 2019). This includes both abuse control and merger control. The discussion will encompass a number of key areas, including the length of procedures, irreversible damage done before enforcement becomes effective, ambitious standards of proof competition authorities are required to meet, deficiencies in practices and procedures, political risk-aversion hampering controversial/confrontational enforcement, etc. In addition to reinvigorating these two areas of competition policy, the political agendas of numerous jurisdictions in the early 2020s included the introduction of further regulation of market power. This was driven by a considerable number of commissioned expert reports which identified enforcement deficits and (in part) recommended regulation (comparative summary: Kerber 2019).

In 2022, the EU implemented the Digital Markets Act (DMA) in order to regulate the behaviour of gatekeepers in specific digital ecosystems. Focusing on *contestability* (see section C) and fairness, the DMA is usually viewed to limit the (relative, absolute, and systemic) market power of these gatekeepers (inter alia, Budzinski & Mendelsohn 2023; Mendelsohn & Budzinski 2023; Podszun 2023). Thus, the obligations imposed on these gatekeeper firms, which each can be regarded as dominating a specific digital ecosystem, exhibit similarities to the special responsibilities for dominant firms as codified in the prohibition of the abuse of market power. Several obligations resemble theories of harm that played a significant role in abuse control antitrust cases against these firms in the recent past. Overall, the DMA can be considered a regulatory instrument for the control of market power in addition to competition law (inter alia, Beems 2023; Podszun 2023).

IV. Conclusion

Market power is a multi-faceted phenomenon that consists of several distinguishable types like absolute market power (single-firm monopoly and dominance), collective market power, relative market power, and systemic market power. Due to the possibility of merit-driven ways into market power positions (especially disruptive innovations), it is difficult to prohibit market power – despite its welfare-reducing effects inside the affected markets (anticompetitive effects) and in other parts of the economy and society (rent-seeking, lobbyism, distributional issues). Therefore, competition policy usually focuses on preventing non-merit ways into market power (merger control) and on combating the (anticompetitive) abuse of market power. New developments in the context of digitization and new empirical insights on the rise of market power have pushed the topic of market power up the antitrust agenda in the 2010s and 2020s. In particular, there is a need to embrace phenomena of systematic market power more intensively.

C. Contestability

I. Introduction

Contestability refers to the openness of markets, i.e. the conditions for market entry and exit as well as expansion of business activities. Crémer et al. (2021: 14) provide the definition "[c]ontestability is the ability for non-dominant firms to overcome barriers to entry and to expansion to the benefit of users", representing modern competition economics thinking. However, the term contestability is often used in antitrust law and economic discussions without a clear definition and with varying meanings. Recently, the term has gained new attention and

popularity as one of the two main objectives of the European Union's Digital Markets Act (DMA), a new law to regulate gatekeepers in digital services markets.

II. The Theory of Contestable Markets

II.1 The Baumol Model

The economic theory of contestability was pioneered by William J. Baumol and his co-authors (Baumol & Willig 1981; Baumol 1982; Baumol, Panzar & Willig 1985; see also: Spence 1983; Baumol & Willig 1986), although the term had been used earlier (Stigler 1957, 1987). While the early literature mostly used the rather vague notion that contestability in the sense of free access to markets promotes competition, Baumol and his co-authors analysed in detail the prerequisites for perfect contestability. The latter is given when so-called hit-and-run entries are possible: firms can enter markets at no cost, compete, and exit the market again at no cost. If hit-and-run entry is always possible, threatening the monopolist's profits, the monopolist will anticipate this threat and change its market behavior to that of being in competition (rather than being a monopolist). Thus, Baumol's concept addresses the idea that potential competition may suffice to discipline a monopolist, i.e., that the actual market structure does not matter much. In perfectly contestable markets, even a monopolist behaves as in competitive markets, and there is no harm to social welfare. Since monopolists cannot exploit their market power in any way without provoking hit-and-run entry, no regulatory or antitrust action against monopolists is necessary in perfectly contestable markets.

On the one hand, Baumol and co-authors on the one hand, demonstrate that potential competition can work similar to real competition if markets are perfectly contestable. However, they also show in detail what prerequisites are required for perfect contestability. Their analysis makes clear that hit-and-run entry requires, inter alia, the total absence of barriers, including entry costs, homogeneous goods (no supplier-specific preferences of demand), and also no exit costs. The latter brought attention to the concept of sunk costs, i.e. costs of market entry that cannot be recouped upon exit, such as certain investment costs and fixed costs, but also opportunity costs such as the acquisition of knowledge. Furthermore, perfect contestability rests on the assumption that the incumbent monopolist maintains its pre-entry price and does not or cannot lower its price in the face of entry. If this flexibility exists, monopolists can charge monopoly prices and react to entry only when it is imminent (Motta 2004: 74). Overall, the assumptions that are necessary to derive perfect contestability are rarely met in real-world markets. This also implies that real-world monopolies usually occur in only imperfectly (if at all) contestable markets and thus require and justify antitrust attention.

Later literature has extended the theory of contestable markets to narrow oligopolies, multi-product firms, product differentiation, and different forms of competition – often with the result that an effective disciplining of powerful incumbents becomes even less likely and the necessary modelling departed further from antitrust applicability (inter alia, D'Aspremont et al. 2000; Crémer et al. 2021: 15-16). An important conceptual extension is to include the expansion of a firm's market activities in addition to "pure" entry (Crémer et al. 2021). Especially in markets where one firm dominates (without holding a monopoly in the strict sense), potential competition can come from both new entrants and fringe firms that expand their business activities in the market in question. The barriers to entry and the barriers to expansion may be similar to some extent and, more importantly, the competitive effects are similar in structure.

II.2 Antitrust Implications

The development and publication of the contestable markets model in the late 1970s and early 1980s coincided with the heyday of the Chicago School of Antitrust Analysis. Thus, it may not be surprising that it was commonly interpreted through a Chicago lens and, as such, has been seen as supporting the Chicago School by reinforcing the importance of potential competition and thereby emphasizing the self-healing forces of market competition in the absence of social barriers to competition.

This interpretation thus rested on the procompetitive effect of (perfect) contestability. As long as markets are contestable, and as long as direct and immediate market entry is possible to cream off the monopolist's profits, (quasi-)monopolies do not cause any competition problems. On the contrary, even monopolies can be competitive if they are contestable. Thus, there is no need for regulation or antitrust intervention in such monopolies. Combined with the Chicago assumption that barriers to entry are mostly the result of government regulation and policy intervention, and rarely the result of market evolution itself, the contestable market theory was used by Chicago advocates to promote antitrust laissez-faire.

However, this is just one (albeit prominent) reading of the theory of contestable markets from an antitrust policy perspective. It is a reading that focuses on the main result – potential competition can discipline even a monopolist under perfect contestability – and tends to neglect the conditions for this theorem to hold. In economic theory, early critics have pointed to an interpretation in which these prerequisites are so ambitious that they usually do not hold (inter alia, Dixit 1982; Shaked & Sutton 1983; Shepherd 1984; Sutton 1991). In particular, this addresses the assumptions that (i) an incumbent monopolist will stick to the pre-entry price, (ii) goods must be homogeneous because otherwise preferences and price differentiation will create

"natural oligopolies", (iii) the absence of sunk fixed and other sunk costs, and (iv) the existence of switching costs (Klemperer 1987; 1995). Further research since these early days (see section II.1) leads to the following recent summary by leading industrial economists: "It is never the case that entry is costless, and it is extremely rarely the case that the incumbent monopolist cannot decrease its price nearly instantaneously upon entry by a rival. If this is the case, entrants have no incentives to enter, unless they can recover all the costs that they have incurred to enter – which is, in practice, never the case. (…) There is also no empirical evidence that contestable markets provide a good guide to any industry" (Crémer et al. 2021: 16).

In sharp contrast to the Chicago-style reading, the theory of contestable markets can be interpreted from an antitrust policy perspective as actually demonstrating how unlikely it is that there will be sufficient contestability in real-world markets for potential competition to effectively discipline monopoly power. Since the conditions for perfect contestability will rarely be present, and since even small deviations from perfect contestability undermine the procompetitive effect, the theory of contestable markets can be read as actually pointing to the need for an active antitrust policy. It cannot rely on contestability as a substitute for active protection of competition. In later publications, Baumol and his co-authors embrace this second line of reasoning and emphasize the limits of potential competition to cure the inefficiencies of (quasi-)monopolies, especially from a dynamic perspective (Audretsch et al. 2001). If markets are incontestable, the crucial issue of sunk costs must be addressed – along with structural and strategic barriers to entry and exit.

Following up on the second reading, a third interpretation of the theory of contestable markets may emphasize the importance of contestability in limiting the scope for incumbents to abuse market power – even if it does not completely erode it (Motta 2004: 74). If the threat of entry and expansion at least imperfectly limits the potential for abuse of market power by monopolistic and dominant firms, this finding emphasizes the importance of (preserving) open markets and the importance of addressing barriers to contestability through competition policy. This is particularly true when the erection of strategic market barriers is part of the (anticompetitive) arsenal of dominant firms in a given market, perhaps in addition to existing structural barriers to entry and exit. Reconsidering public and regulatory barriers to contestability remains relevant, even if it is not the sole focus, as in the Chicago-style reading of the theory.

The combination of the second and the third readings would then suggest that antitrust policy has a role to play in preserving open markets. Protecting and enhancing contestability is an

element of protecting the competitive process, and as such it may be a sensible task of antitrust policy to actively address contestability issues.

III. Contestability in Competition Law and Policy

III.1 General Remarks

Consistent with the different interpretations of contestability outlined in the previous section, contestability reasoning has played very different roles in competition law and antitrust cases. In its Chicago-style understanding, contestability contributed to justifying the hands-off approach of lenient antitrust enforcement and reliance on self-healing forces during the Reagan era of antitrust policy. In general, contestability has focused attention on potential competition and its disciplining effects. This is particularly relevant to merger control, where the creation or strengthening of a dominant position may be mitigated by the existence of potential competition – a force that prevents the new dominant entity from behaving like a monopolist, so that competition is not actually lessened. Although contestability did not make it explicitly into the law, it was discussed as a relevant argument in more than 60 U.S. antitrust and regulatory cases between 1982 and 1993, including the Santa Fe/Southern Pacific railroad merger (Shepherd 1995).

More in line with the second line of interpretation, the European Commission used contestability as a reason to inquire whether the conditions for perfect contestability were actually met by the real markets in question. In analysing the data clearing market in the context of the proposed Syniverse/MACH merger, the Commission accepted that potential competition may be sufficient to discipline market power. However, the Commission carefully analysed whether entry and expansion into the market were sufficiently easy to make contestability effective. It found that there were relevant barriers to entry and exit and that goods were rather heterogeneous, which further weakened the case for contestability (Goeteyn et al. 2015). It cannot be concluded, however, that contestability has become a regular argument in European competition law cases.

Contestability has also played a role in discussions about the liberalization and regulation of network industries in several countries. In such markets, firms can often only compete if they have access to certain bottlenecks, which usually consists of the physical network (of rails, telephone cables, power lines, etc.). While contestability has often been used in the U.S. to abolish access regulation in such industries (Shepherd 1995), many European countries have used contestability arguments to justify regulation of the incumbent in order to guarantee

competitors access to the markets in question. Thus, contestability reasoning also plays a role in the context of the essential facilities doctrine and related access regulation.

Recently, the contestability of markets has become more relevant and intensively discussed with the rise of digital ecosystems, which are often characterized by a mix of direct and indirect network effects (both being demand-side size economies of size), that limit contestability by frustrating entry and expansion. In addition, these digital ecosystems typically contain potential new barriers to contestability based on the prominent role of data-driven business models (inter alia, Budzinski & Kuchinke 2020; Budzinski & Mendelsohn 2023). Data-based barriers may include (the restriction of) access to relevant data, to relevant amounts of data, or to sophisticated data analysis tools and skills. In addition to merger cases where the pooling of data from different sources may become possible (e.g., Facebook/WhatsApp in 2014 or Google/Fitbit in 2020), abuse of dominance cases increasingly revolve around contestability issues, for instance when marketplace providers restrict marketplace business users' access to data from their own transactions through these marketplaces in order to self-preference their own shops, goods, and content (inter alia, Bougette et al. 2022). According to Crémer et al. (2021: 17), a contestability-oriented competition policy should focus on "(a) prohibiting practices that make entry and/or expansion difficult while at the same time hurting the welfare of users; and (b) proposing proactive pro-competitive interventions that make entry of new platforms and expansion of small ones easier." Furthermore, it favours competition within the market over competition for the market (Crémer et al. 2021: 18-23).

III.2 Contestability and the EU Digital Markets Act

In response to the perceived incontestability of digital ecosystems and their markets, the European Union puts contestability at the heart of a new competition-related regulatory regime. The EU's Digital Markets Act (DMA) targets providers of core digital platform services, which it views as gatekeepers with significant anticompetitive power over (especially) business users and consumers. One of the primary objectives of the DMA is the contestability of the markets surrounding these core platform services. To this end, rec. 32 of the DMA provides the following definition: "For the purpose of this Regulation, contestability should relate to the ability of undertakings to effectively overcome barriers to entry and expansion and challenge the gatekeeper on the merits of their products and services." Thus, unlike traditional utility regulation, the DMA does not assume that markets in which gatekeepers have market power are completely incontestable or fundamentally unsuited to sustainable competition (i.e., no market failure). Instead, the DMA assumes that gatekeepers can, in principle, be subject to

competitive pressure. However, rec. 3 discusses how the contestability of these markets is reduced by "very high barriers to entry or exit". While this may partly be due to structural barriers such as strong direct and (symmetric) indirect network effects and other economies of scale (e.g., related to the collection and use of data), the European Commission also argues that gatekeepers create "serious imbalances of bargaining power" which in turn incentivize "unfair practices and conditions for users" (Recital 4). Thus, strategic barriers to contestability join structural ones, so that – according to the European Commission – regulation is necessary to preserve and revive contestability in digital ecosystems.

Whether contestability is a goal in itself or rather a milestone to protect and/or to generate competition is controversial in the literature discussing the DMA (recent summaries: Mendelsohn & Budzinski 2023; Podszun 2023). In addition to targeting the protection of competition in specific markets, the DMA also includes competition for and access to markets as relevant objectives (inter alia, Caffarra & Scott Morton 2021; Schweitzer 2021). Furthermore, many of the obligations that the DMA imposes on gatekeepers mirror previous antitrust cases in the EU and elsewhere, indicating that competition issues are at their very core. Examples include rules to facilitate entry or access by ensuring that new entrants obtain the necessary data to compete with incumbents (Art. 6 No. 9, 10 DMA), or to create "room" for competitors (see also Podzsun et al. 2021) by ensuring that users can switch between applications (Art. 6 No. 6 DMA) or uninstall the gatekeeper's applications (Art. 6 No. 3 DMA). These obligations are strongly reminiscent of the European Commission's Google Android decision (Google Android Case AT.40099) and the Apple Add Store controversy (Apple Cases AT.40437 and 40716; see also Caffarra & Scott Morton 2021). Other obligations seem to derive from competition law cases such as Google Shopping, Google Android and Google Adtech (Google Shopping Case AT.39740; Google Android Case AT.40099; Google Adtech, AT.40670) and aim at preventing gatekeepers from leveraging their economic (market) power into adjacent markets (Art. 5f, Art. 6b, Art. 6f. DMA; see also Caffarra & Scott Morton 2021).

On the other hand, the DMA's unique notion of contestability refers to the (direct) control of the power of gatekeepers, an economic power that extends diagonally across markets and also into emerging markets (inter alia, Colomo 2021), thus emphasizing leveraging of power and conglomerate effects. Although the latter terms are common in antitrust analysis (although usually – and perhaps wrongly – regarded as only exceptionally dangerous to competition), the direct regulation of corporate power through obligations can be seen as a significant departure from competition policy (inter alia, Ryna 2021; Beems 2023; Moreno Belloso & Petit 2023).

Moreover, the sector-specific (regulatory) character of the DMA is emphasized (Franck et al. 2021; Podszun 2023) and the appropriateness of ex ante regulation in dynamic markets is questioned (Budzinski & Mendelsohn 2023). Additionally, contestability may complement (traditional) competition protection by including interventions to generate competition where sclerotic structures do not (or no longer) allow for effective competition. In any case, contestability in the sense of the DMA goes beyond narrow interpretations of the consumer welfare-oriented approach of competition law and justifies regulations that serve to open markets without necessarily being tied to direct positive effects for consumers in individual cases.

Irrespective of whether the DMA and its focus on contestability mirrors competition law with new instruments or represents a type of sectoral regulation, its understanding of contestability departs from Baumol's theory of contestable markets. According to Crémer et al. (2021: 14), contestability in the DMA "should (…) be understood as making it easier for nondominant firms, both new entrants and smaller competitors, to compete with the gatekeepers."

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