

Dominant positions or dominant designs? Market power and innovation in European competition law

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Abstract

Although market power in platform-mediated markets seems to be ubiquitous, in some cases it may be short-lived due to innovation. A new undertaking fuelled by innovation can take away the market power of established undertakings. The theory of the industry life cycle and the concept of dominant design might help to understand when market power is a problem and when innovation may make market power short-lived. All industries follow a similar pattern, where the emergence of a dominant design is the key turning point, signifying when innovation is no longer a competitive constraint. It is this more dynamic theory that the Court and the Commission could use to both *nuance and inform* the market power assessment and the role of innovation used in abuse of dominance and merger control cases. These theories will not replace the market power assessment but it could support the current assessments of market power.

Keywords: dominant design, dominant position, innovation, online platforms, ecosystem.

JEL Classification: K210

1. Introduction

Innovation can disrupt the market power of online platforms quickly and unexpectedly, as can be seen by looking at the development of the mobile operating systems market. Symbian was a mobile operating system in the 2000s, consistently obtaining a market share between 40% and 60% (Linux Netbook, 2014). The position of Symbian suddenly changed in 2010, where it started the year with a market share of more than 40% but had to see Google's Android take over its market power. By early 2011, Google's Android obtained a market share of about 40% (Linux Netbook, 2014). What happened to ensure that Google was able to take over this market so quickly? With an innovative new mobile operating system, Google drastically changed the nature of mobile operating

systems by allowing third party app developers to develop for the mobile operating system (Markovic and others, 2018, p. 6). The mobile operating system became an online platform with its own ecosystem of app developers who adopted the new platform *en masse*.

Innovation brings an uncertainty to the market, which is especially prominent in markets where online platforms operate. In these innovative and uncertain platform-mediated markets new undertakings frequently enter and exit the market, as was also the case for the mobile operating market (*Google/DoubleClick*, para 335). At the same time platform-mediated markets seem to be a breeding ground for market power. Online platforms bring together groups of users that interact or innovate on top of the platform (Cusumano, 2019, p. 13). For example, Apple brings together app developers and iPhone users through its App store and iOS operating system, which allows for new ancillary products and services to be developed. The operating system is the core platform and the app developers and users compose the ecosystem or the periphery of the core platform (Moore, 1996; Cusumano, 2019, p. 13). As more users in an ecosystem connect to the core platform, the more valuable the core platform becomes. Once a platform reaches a critical mass of users, the market may “tip” in favour of the platform, giving the platform market power (Katz and Shapiro, 1994, p. 93; Crocioni, 2007, pp. 468–469). It seems that this happened to Google’s Android in 2010, providing the operating system with a competitive edge over other operating systems in the market.

This quick rise to dominance coupled with the uncertainty caused by innovation poses a problem for traditional European competition law tools, which cannot take into account these suddenly changing conditions (Costa-Cabral, 2017, p. 8). European competition law is predominantly concerned with static efficiency, which can be defined as the best configuration of production factors at a certain point in time (Costa-Cabral, 2017, p. 8). Such a static analysis is also used to assess market power in European competition law, which is determined at the moment of an alleged abuse. Market power is legally defined by the concept of a dominant position, which is a position of economic strength that allows undertakings to behave independently from its competitors, customers, or consumers (*United Brands*, 1978, para 65; *Hoffman La Roche*, 1979, para 38; *Michelin*, 1983, para 30). This position of strength is determined by the competitive constraints on an undertaking, which can be the constraints imposed by actual competitors, future competitors, and countervailing buyer power (Guidelines 102 TFEU, para 12). Only potential competition considers a future change in the market, whereas the other competitive constraints focus on the current situation. As innovation as a competitive constraint brings a degree of uncertainty to the future market

development, it becomes difficult to predict whether there is a durable dominant position (Crocioni, 2007, p. 519)

In this article I will show how the market power assessment in European competition law currently is not fit to deal with the uncertainty that innovation brings in platform-mediated markets. I will discuss this in section 2. In economic theory, there has been a move from static theory to a dynamic theory of markets. It has been theorized that all markets follow a similar pattern of development, where innovation is initially a competitive constraint but stops constraining market power when a dominant design emerges. I will explore this theory and its relevance to online platforms in section 3. In section 4, I will show how this pattern of innovation and the concept of dominant design can inform market power assessments in European competition law. Section 5 then concludes by answering the question how the market power assessment in European competition law could change to deal with the uncertainty that innovation brings to the platform-mediated markets.

2. Market power and innovation in European competition law

In this section I will show that the current assessment of the market power in European competition law is not fit to deal with innovation as a competitive constraint on the power of online platforms. European competition law focuses on static efficiencies and adopts a static view of the market. This is a problem as innovation relates to dynamic efficiencies and requires a dynamic view of the market. I will first explain this difference. Afterwards, I will show how market power or a ‘dominant position’ is currently assessed in European competition law in both abuse of dominance as well as merger control cases.

2.1 Static versus dynamic efficiency

European competition law has traditionally been driven by static concerns, which means that undertakings and consumers are observed at a particular point in time (OECD, 2012, p. 12). Static concerns have made the assessment of a dominant position and certain types of abuses measurable but give an incomplete representation of reality. Static efficiencies focus on the most efficient result as it relates to output, price, and costs, which can be calculated by using allocative efficiency and productive efficiency (OECD, 2012, p. 12). A market achieves allocative efficiency when all resources are allocated to their highest valued use (Kolasky and Dick, 2003, p. 242). When there is productive efficiency, it is not possible to produce a given quantity of output at a lower cost (OECD, 2012, p. 13). For these efficiencies, it is assumed that the technology with which goods are produced is also assumed to be fixed, or, not subject to change (OECD, 2012,

p. 12). This is at odds with what we observe from platform-mediated markets, which seem to be constantly subject to change.

Dynamic efficiencies are more closely related to that potential of change in technology. Dynamic efficiencies denote the ability of an undertaking and its incentives to introduce new products or processes of production or to improve existing ones (OECD, 2012, p. 14). Dynamic efficiencies display their effects over time and show the best combination of production factors considering how they might be improved (OECD, 2012, p. 14; Costa-Cabral, 2017, p. 8). It seems that dynamic efficiencies, considering a longer time frame and development, are better fit to deal with the changes and uncertainty in platform-mediated markets than static efficiencies.

In the next two sections I will show how in European competition law the assessment of market power in abuse of dominance cases and merger control is focused on static efficiencies, which only accommodates innovation to a limited extent.

2.2 Market power and innovation in abuse of dominance cases

To determine whether an undertaking has a dominant position in European competition law, the Commission examines the competitive structure of the market, and, in particular, the competitive constraints imposed by actual competition, future entry and exit or potential competition, and countervailing buyer power (Guidelines 102 TFEU, paras 13–24). The existence of a dominant position derives in general from a combination of these factors which, taken separately, would not necessarily be determinative for the assessment of a dominant position (*United Brands*, 1978, paras 65–66; *Hilti*, 1991, para 90; *Gøttrup-Klim*, 1994, para 47; *Telefonica*, 2012, para 148).

However, from these factors, the actual competition as measured by market shares is highly important in determining that an undertaking has a dominant position (*Hilti*, 1991, para 90; *Imperial Chemical Industries*, 2010, paras 255–256; *Telefonica*, 2012, para 148). An undertaking holding a market share in excess of 40% will be presumed dominant but additional factors like barriers to entry will have to be observed to conclusively establish dominance (Communication of the Commission on article 82, para 15). Very large market shares of more than 50% “are in themselves, and save in exceptional circumstances, evidence of the existence of a dominant position” (*Hoffmann-La Roche*, 1979, para 41; *Solvay*, 2009, para 277; *Imperial Chemical*, 2010, paras 256 and 259).

The Commission and the Court have always nuanced the importance of market shares by clarifying that “a substantial market share as evidence of the existence of a dominant position varies from market to market according to the structure of these markets [...]” (*Hoffman La Roche*, 1979, paras 39–41; *AKZO*, 1991, para 60; *Hilti*, 1991, paras 90-92; *France Telecom*, 2007, para 100). In previous cases on

online platforms, the market shares have nearly always exceeded this threshold of 50%, which has been a decisive factor in determining that an undertaking has a dominant position (*Google Shopping*, 2021, para 54; Commission decision *E-Book MFN*, 2017, para 58; Commission decision *Google Android* 2018, para 439).

For online platforms, the Commission held that a dominant position can still be determined based on market shares, as the “fast-growing market does not show signs of marked instability during the period at issue and, on the contrary, a rather stable hierarchy is established” (*Google Shopping*, 2017, para 267).

Subsequently, market shares and barriers to entry and expansion were used to determine that Google had a dominant position and innovation as a competitive constraint was therefore not a factor to refute these indicators of market power (*Google Shopping*, 2017, section 6.2.1 and 6.2.2). This decision by the Commission has been recently confirmed by the Court (*Google Shopping*, 2021).

Another way for the Court and the Commission to consider innovation as a competitive constraint on undertakings is by using the concept of potential competition. The Court and the Commission can then consider how potential competitors exert a competitive constraint on undertakings. This concept of potential competition does not immediately relate to innovation. Yet, when a potential competitor is fuelled by innovation, innovation can indirectly be taken into account as a competitive constraint on the dominant position of an undertaking. For a potential competitor to discipline an undertaking or pose a competitive constraint on the position of undertakings, it must be reasonably certain that entry is likely, timely, and sufficient, which in practice means that a potential competitors should be able to enter the market within the next two years (Commission Guidelines 102 TFEU, para 16).

In sum, market power in abuse of dominance cases is assessed using relatively certain and predictable competitive constraints, focusing the assessment on static efficiencies. Market shares as an important factor show the current competition on the market and potential or future competition can only be taken into account when it is likely, timely, and sufficient. Innovation as an inherently unpredictable and uncertain factor is rarely considered.

2.3 Market power and innovation in merger control

In merger control, concentrations that significantly impede effective competition are not allowed, in particular if this is the result of the creation or strengthening of a dominant position (Article 2(2) and (3) Merger Regulation). This makes the assessment of a dominant position only a subset of the broader assessment of significant impediments to effective competition. This is a forward looking assessment where the Commission compares the pre- and (estimated) post-merger competitive conditions (Article 2(1) (b) Merger Regulation). The assessment of

a dominant position is therefore different from abuse of dominance cases, which assesses the past.

As assessing a dominant position in merger control is only a subset of the overall assessment and has a forward-looking nature, there is a different weight placed on the factors used to assess a dominant position than in abuse of dominance cases. In abuse of dominance cases, the Court and the Commission seem to rely heavily on market shares at the time of the alleged abuse. Market shares in merger control are inherently less important as other factors may also significantly impede effective competition and as the market will necessarily change following the concentration. Post-merger market shares can then only be *an estimation* of what is expected after the merger.

The Court and the Commission therefore more readily accept other competitive constraints such as innovation in the assessment of competitive conditions. Innovation is seen as a competitive constraint on undertakings that leads to market shares not being indicative of market power and, therefore, of lasting damage to competition (Cisco, 2013, para 69). The fact that an undertaking has high pre- or post-merger market shares can be made insignificant by other market conditions such as the instability of a market due to innovation or low entry barriers combined with a heterogeneous market character with growth, innovation and technological change (*Tetra Pak/Alfa Laval*, 1991; *Philips/Agilent Health Care Technologies*, 2001, paras 31-32; *HP/Compaq*, 2002, para 39; *Microsoft/Skype*, 2011, paras 78 and 99; *Cisco Systems*, 2013, paras 61 and 65). The problem with these assessments is that we cannot predict the future of innovation. The forward-looking assessments in merger control therefore always have a certain level of uncertainty, reducing the credibility of the assessment.

Similar to abuse of dominance cases, innovation can also be considered as a competitive constraint by using the concept of potential competition. This concept of potential competition does not immediately relate to innovation but might take into account *innovative* potential competitors. Potential competitors can only impose a competitive constraint if their entry is likely, timely, and sufficient to deter or defeat any potential anti-competitive effects of the merger (Commission Guidelines on horizontal mergers, paras 68–69). This entails that barriers to entry are assessed for the likelihood of entry, entry should take place within two years for the timeliness of entry and be of sufficient scope and magnitude to deter or defeat the anti-competitive effects of the merger (*Saint-Gobin/Wacker-Chemie*, 1997, para 184; *Alcoa/Reynolds*, 2002, paras 31–32; *Tetra Pak/Laval*, 1991, section 3.4). It seems that the Court and the Commission still adhere to a static view of competition by limiting the impact of innovation in time.

In sum, the assessment of a dominant position in merger control is only part of the overall assessment of significant impediment of competition and is forward-

looking in nature. As a consequence, a different weight is placed on the factors for determining market power and other factors than market shares, such as innovation, are more readily accepted as a competitive constraint on a dominant position. However, the static nature of European competition law remains a problem, as innovation is inherently uncertain and unpredictable, reducing the value of the forward-looking assessments of market power in merger control. For online platforms, innovation and its inherent uncertainty and unpredictability becomes even more important and there is a need to understand when innovation is important as a competitive constraint. The research done by economists on the industry life cycle can help *inform* and *nuance* the notion of innovation as a competitive constraint in European competition law, with the concept of a dominant design functioning as a key turning point.

3. Dominant designs for online platforms

In innovation studies and economic theory, there has been a move from static efficiencies to including more dynamic theory by showing that all industries follow a similar pattern. The emergence of a dominant design is the key turning point when innovation stops constraining market power. Online platforms seem to also follow this pattern but innovation might constrain market power in the ecosystem longer than in the traditional manufacturing industries (section 3.1). This pattern can inform and nuance European competition law concepts of market power and innovation by identifying a dominant design. If the emergence of a dominant design is the key turning point for using innovation as a competitive constraint, it is important to know how to determine when we can speak of a dominant design. Besides a 50 % market share of the dominant design, the design needs to be the archetype of the product in both the user and the designer imagination, the design needs to provide an answer to the need of a large number of people and the winning design freezes the socio-economic context (section 3.2).

3.1 Dominant design in the industry life cycle for online platforms

Dynamic efficiency as associated with innovation shows that markets are not stable and do not necessarily reach an equilibrium but there can be a degree of change. This change can be visualised by a dynamic pattern, which all industries follow, called the industry life cycle. The phases are roughly the same across industries: the start-up phase, the growth phase, the maturity and the decline phase. Customer demand starts out limited in the start-up phase and then slowly gains traction, attracting other undertakings to the market in the growth phase. In the maturity phase customer demand stagnates, which leads to a shake out of undertakings and thus consolidation in the market. In the decline phase,

customer demand declines in favour of a new industry. Profitability and market characteristics depend on the phase of the industry (Porter, 1980).

The competitive constraint of innovation on undertakings also varies with these market phases (Utterback and Abernathy, 1975; Tushman and Murmann, 1998). After a technological breakthrough, in the start-up and growth phase, there are many competitors that market many different designs of a product. For example, when the automobile was brought to the market, there were many different designs with different engines, steering wheels, clutches, and materials. The companies that market these designs compete on innovation and try to persuade the most customers to use their design (Utterback and Abernathy, 1975, p. 641; Anderson and Tushman, 1990, p. 606 and 610; Tushman and Murmann, 1998, p. 10). Competition at this stage is marked by competition on innovation (Anderson and Tushman, 1990, p. 611).

Online platforms also start with this start-up phase or era of experimentation, where innovation is a competitive constraint on the power of online platforms. Taking the development of mobile operating systems as an example, we currently have two dominant mobile operating systems: Apple's iOS and Google's Android (Taleby, 2017, p. 31). Until Apple and Google made their mobile operating systems open to third party app developers, different manufacturers, such as Nokia, Blackberry, and Samsung, had introduced various different devices with different operating systems that substantially differed from each other since the introduction of the smartphone in 2000 (Markovic and others, 2018, p. 6). At this point, innovation imposes a competitive constraint, as new designs are often and quickly introduced in the market and gain some traction among customers. This phase of uncertainty and innovation as a competitive constraint ends with the establishment of a dominant design. Although the definition of dominant designs has varied over time, in essence, a dominant design is the successful design which is widely adopted and changes the nature of competition, driving out other competitors (Murmann and Frenken, 2006, p. 932; Sidak and Teece, 2009, p. 604). The emergence of a dominant design means that future technological progress consists of incremental improvements elaborating the standard, meaning that subsequent design are so similar that disruption seems unlikely. (Anderson and Tushman, 1990, p. 613). Innovation therefore *stops being a competitive constraint on the core platform* and undertakings switch to price competition (Anderson and Tushman, 1990, p. 613). For example, once Google introduced a mobile operating system open to third parties, other undertakings either copied the design (e.g., Apple) or left the market (e.g., Symbian) (Taleby, 2017, p. 31). Dominant designs tend to remain stable for long retention periods in a relatively concentrated market, which then enters the maturity stage in the industry life cycle (Sidak and Teece, 2009, p. 604).

This can also be seen in platform-mediated markets. For example, in the 1990s, many search engines entered the market with different ways of categorizing and searching the Internet. Dominant positions were taken over by new entrants with an innovation quite frequently until Google Search entered the market with its PageRank algorithm (Buganza and Della Valle, 2010, p. 47). Google Search became the dominant platform design, which comprises a stable technological architecture of core components (Zeijen and others, forthcoming). The core platform has a community of organizations and individuals that produce goods and services value on the core platform (Moore, 1996). The dominant platform is the core platform and the community depending on the platform is the ecosystem or the periphery (Kenney and Zysman, 2016, p. 67; Kenney and others, 2021, p. 1). Google Search, for example, has advertisers, businesses, and users depending on the search engine.

The emergence of a dominant design on the core platform leads to a shake out of undertakings in the market of the core platform (Porter, 1980). A shake-out means that the market consolidated and competition on the core platform market diminishes. For mobile operating platforms, Apple and Google became the dominant platform designs around 2011, after which they have not changed substantially despite new entrants such as Amazon's Fire OS (Taleby, 2017, p. 31). As innovations elaborate on the standard, users are not persuaded to switch to alternative designs because of network effects, switching costs, and market tipping. Users are attracted to platforms with many other users and when a critical mass of users is reached, the market tips toward the platform, leaving no room for alternatives (Katz and Shapiro, 1994, p. 93; Crocioni, 2007, pp. 468–469; OECD, 2020, p. 17). New entrants in the market are not different enough to overcome the costs that users occur when switching to alternatives, such as losing connections with other users or learning how a new platform works (Fan and Suh, 2017). Innovations therefore no longer a competitive constraint on the market power of undertakings.

In the periphery of the core platform an opposite movement takes place: a shake-in. A shake-in means that where core platforms leave the market, the number of complementor firms in the periphery of the platform increases (Ozalp and others, 2018, p. 1205; Zeijen and others, forthcoming). Complementor firms are attracted to stable core platforms, as they face steep learning curves and increased development costs with every significant change to the core platform (Ozalp and others, 2018, p. 1205). For example, if Apple changes its operating system, all app developers need to change their apps. Stable core platforms with a dominant design benefit complementor firms (Impact Assessment Report Digital Markets Act, 2021). When it became clear that Google and Apple were

the dominant platform designs, more app developers dared to invest in their platforms (Markovic and others, 2018, p. 6).

Complementors in the periphery of the core platform can still innovate after the emergence of a dominant design. Even if Android and iOS are the dominant core platforms, app developers can still innovate on those operating systems. Complementors design and develop their own functionality within the boundaries that the core platform gives them. This means that even when a dominant design has emerged on the core platform level, and innovation is no longer a competitive constraint on the market power of core platforms, more significant changes can still be expected in the periphery of the product (Zeijen and others, forthcoming). In the periphery of the platform, innovation can therefore still be a competitive constraint on the companies in the periphery of platform, such as app developers. In sum, a dominant design is the key turning point for innovation as a competitive constraint on online platforms. Before a dominant design emerges, innovation makes the future trajectory of the market uncertain and unpredictable. A new undertaking can enter the market at any time with an innovation and take over the market. After a dominant design has emerged, this is less likely to happen and innovation is no longer a competitive constraint on the core platform. Yet, it can still constrain the complementor firms that operate in the periphery of the core platform.

3.2 Determining the emergence of a dominant design

If the emergence of a dominant design is the key turning point for using innovation as a competitive constraint, it is important to know how to determine when we can speak of a dominant design. A dominant design has emerged if a majority of designs in the market is the same. The notion of a majority of designs can be defined empirically by using either a threshold (e.g., 50, 40, 30, 20% market share) measure or a variety measure (such as the Herfindahl index) (Murmman and Frenken, 2006, p. 944). To determine whether a dominant design has emerged, it is not the market shares of an undertaking that needs to be measured but the design.

In economic theory, using only the empirical calculation of market shares is regarded as oversimplified and insufficient to determine the existence of a dominant design (Anderson, Tushman, and O'Reilly, 1997; Murmman and Frenken, 2006, p. 944). This criterion has therefore been expanded with three further characteristics to know whether a dominant design has emerged. Besides a 50% market share of the dominant design, the design needs to be the archetype of the product in both the user and the designer's imagination, the design needs to provide an answer to the need of a large number of people and the winning design freezes the socio-economic context (Anderson, Tushman, and O'Reilly, 1997). For example,

Google Search answered nearly all needs of people using search engines and other search engines changed to Google's single search bar design. This froze the socio-economic context and changed innovation from disruptive to incremental innovations (Buganza and Della Valle, 2010, p. 47)

Using a combination of these three criteria is also important because a dominant design can be best viewed as a continuum instead of a binary state: it is not that there is or is not a dominant design but there can be a dominant design to a certain extent (Murmman and Frenken, 2006, p. 944). This means that a design can be more or less dominant in an industry (Murmman and Frenken, 2006, p. 944). This could entail that when the majority of these factors point towards a dominant design, innovation might no longer pose a competitive constraint.

The industry life cycle can inform and nuance the current static market power assessments in European competition law. By determining the phase of the market, innovation as a competitive constraint can be either integrated in the assessment of market power or not. In the industry life cycle, the turning point for innovation as a competitive constraint seems to be the emergence of a dominant design. For online platforms, before a dominant design, innovation is a competitive constraint on the core platform. After a dominant design emerges, the competitive constraint of innovation is no longer exerted on the core platform but on the periphery of the platform, which in turn flourishes because of the stability of the core platform.

4. Dominant designs for online platforms in European competition law

Market power assessments in European competition law are inherently static in nature, where the market power of an undertaking is measured at a certain point in time. Innovation as an unpredictable and uncertain force is important in markets where online platforms operate but is also difficult to integrate in these static European competition law assessments. By identifying the market phase and the emergence of a dominant design through market surveys can help our understanding of innovation as a competitive constraint. When a market is in the start-up or growth phase and does not have a dominant design, innovation can constrain the market power of online platforms. However, when the market is in the maturity phase, it seems less likely that innovation will disrupt the core platform (section 4.1). A dominant core platform means that there will be little innovation on the core platform level (section 4.2) but might leave room for innovation in the ecosystem of the online platform (section 4.3).

4.1 Integrating innovation in the market power assessment

European competition law currently looks at market power at one point of time in the case of abuse of dominance cases and two points in time in merger

control. This is a static assessment of market power and innovation. Innovation is inherently dynamic, unpredictable, and uncertain. Identifying the broader pattern of the market and identifying whether a dominant design has emerged or not can help integrate innovation as a competitive constraint in European competition law.

The phase in which the market is, can show the value we should attach to market shares in market power assessments. When the Commission has measured the market shares, it can simultaneously identify the market phase through the use of market surveys and customer surveys. Before a dominant design has emerged, innovation as a different factor should be taken into account, as has been done by the Commission and the CJEU in merger control cases (see *Cisco v Commission*, par. 69). The turning point is the emergence of a dominant design, which needs to comprise at least 50% of the designs in the market. The design also should be perceived as the archetype of the product in both the user and the designer imagination, answers the need of a large number of people and freezes the socio-economic context (Anderson, Tushman, and O'Reilly, 1997). Determining if a majority of these elements are present in the market can be measured through market and consumer surveys, the Court and the Commission can use this as a reason to pay less attention to innovation in the market power assessment. The industry life cycle or the concept of a dominant design is not the holy grail for assessing the constraining influence of innovation on market power but might be an element to consider.

4.2 Core platform level

For abuse of dominance cases using the industry life cycle and the emergence of a dominant design can be a complementary factor for the Court and the Commission to determine if and if so, how to consider innovation in its assessment. When a dominant design has not been established, innovation could be a factor to consider in the market power assessment. Market power or a dominant position can be constrained by innovation and other factors need to therefore play a more prevailing role in assessing market power. For example, innovation in a general broad sense or *innovative* potential competitors as a competitive constraint could be taken into account. As markets may remain in the pre-dominant design state over a number of years – as we have seen in the case of operating systems and search engines – this might imply that the two-year threshold for potential competitors needs to be extended. After a dominant design has emerged, innovation is less likely to constrain market power due to the stability of the dominant core platform design and the Court and the Commission might be less inclined to consider innovation as a competitive constraint.

For merger control, the industry life cycle and the concept of dominant design can inform the market power assessment in the same way as in abuse of dominant cases. The Court and the Commission have previously considered innovation as a competitive constraint on market power in specific cases. However, the concept of a dominant design and the overall pattern of the industry life cycle might still be valuable for the assessment of market power. The concepts might nuance or clarify why innovation is considered to be a competitive constraint in some cases, whereas in others it is not.

4.3 Ecosystem or complementor level

For the undertakings in the ecosystem, the emergence of a dominant platform design can be beneficial. When a dominant design emerges in the core platform, complementors are more willing to invest in building on that platform as their investment will less likely be lost. The competitive constraint of innovation therefore moves from the core platform level to the ecosystem once a dominant platform design emerges. For European competition law, the industry life cycle and the emergence of dominant design may have implications beyond the assessment of market power. While it is outside of the scope of this article to examine these implications, they can be interesting avenues for future research. For example, it can be observed that once a dominant platform design emerges, complementors become increasingly dependent on these dominant (online) platforms. That turning point of an emerging dominant design therefore might also signify the need for a closer scrutiny abuses of dominance and mergers. The concept of a dominant design shows that horizontal mergers can be a natural movement in the development of markets when a shakeout occurs. The concept also shows that after a dominant design emerges for an online platform with an ecosystem, it seems unlikely that there will be a competitor on the core platform level. Undertakings inside and outside of the ecosystem of the core platform are then more vulnerable to abuse or killer acquisitions.

5. Conclusion

Innovation brings uncertainty to the market. With innovation, a new undertaking may at any point enter the market and quickly take over the dominant position from another undertaking. This uncertainty is especially prominent in platform-mediated markets. This poses a problem for European competition law, which focuses on static efficiencies that are measured at a certain point in time. The development and changes in the market over time are not always considered by competition law tools. The question therefore arises how the market power assessment in European competition law could deal with the uncertainty that innovation brings to platform-mediated markets.

Innovation studies move beyond static theories and conceptualize a more dynamic theory, the industry life cycle. The industry life cycle shows that all industries follow a similar pattern, where the emergence of a dominant design is the key turning point in when innovation is no longer a competitive constraint. It is this more dynamic theory that the Court and the Commission could use to both *nuance and inform* the market power assessment and the role of innovation used in abuse of dominance and merger control cases. These theories will not replace the market power assessment but it could support the current assessments of market power.

How can the Court and the Commission use the industry life cycle and the concept of a dominant design to inform their current assessments? Before a dominant design has emerged, market power may be short lived as innovation constrains it by letting a new undertaking suddenly taking over. Before the emergence of a dominant design, innovation could be a factor to consider in the market power assessment. However, after a dominant design has emerged, we might need to be more sceptical of the competitive constraint that innovation exerts on the market power of online platforms. After a dominant design has emerged, innovation is less likely to constrain market power due to the stability of the dominant core platform design and the Court and the Commission might be less inclined to consider innovation as a competitive constraint. The industry life cycle and dominant designs might be a first step in the direction of dealing with the dynamic force of innovation in the static analyses of European competition law.

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