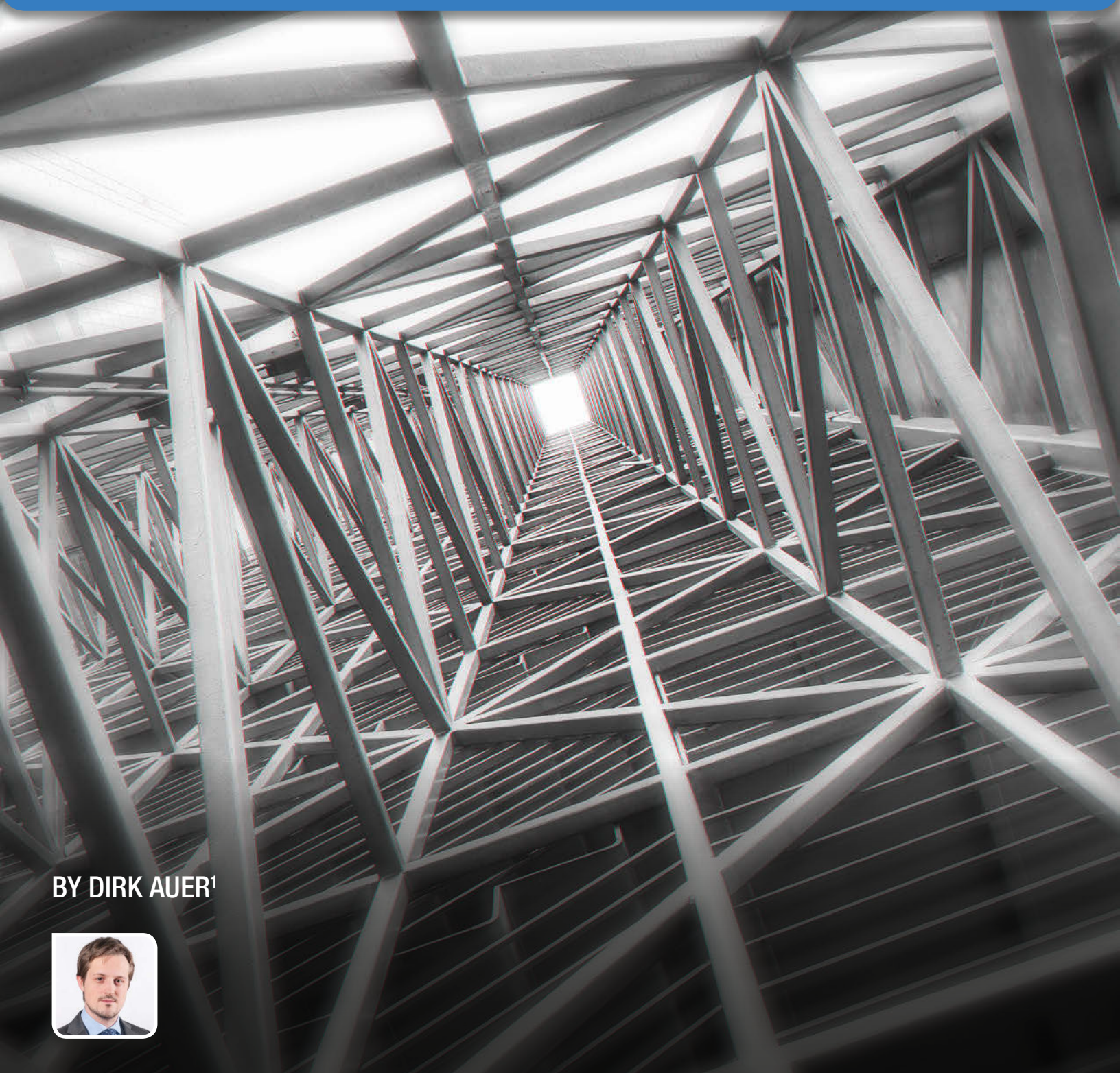


STRUCTURALIST INNOVATION: A SHAKY LEGAL PRESUMPTION IN NEED OF AN OVERHAUL



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By Pinar Akman



Google Android: Record-Breaking Fine on Anti-Competitive Practices Under Article 102 TFEU

By Anca D. Chirita



Assessing the Impact of Vertical Integration in Platform Markets

By Jerome Pouyet & Thomas Trégouët



Amazon and the Law of The Jungle

By Simonetta Vezzoso



With Uncertain Damage Theory Come Unpredictable Effects of Remedies: "Libres Propos" on The Android Case

By Frédéric Marty & Julien Pillot



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CPI Antitrust Chronicle December 2018

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I. INTRODUCTION

How does a market's structure affect innovation? This crucial question has occupied the world's brightest economists for almost a century, from Schumpeter who found that monopoly was optimal,² through Arrow who concluded that competitive market structures were key,³ to the endogenous growth scholars who empirically derived an inverted-U relationship between market concentration and innovation.⁴ Despite these pioneering contributions to our understanding of competition and innovation, if the past century of innovation economics has taught us anything it is that no market structure is strictly superior at generating innovation. Just as the SCP paradigm ultimately faltered because structural presumptions were a weak predictor of market outcomes,⁵ so too have dreams of divining the optimal market structure for innovation.⁶ Instead, in any given case, the right market structure likely depends on a plethora of sector- and firm-specific characteristics that range from the size and riskiness of innovation-related investments to the appropriability mechanisms used by firms, regulatory compliance costs, and the rate of technological change, among many others.

Against this backdrop, it may come as a surprise that the European Commission believes it has cracked the innovation market structure conundrum. Throughout its recent competition decisions, the Commission has almost systematically concluded that more firms in any given market will produce greater choice and more innovation for consumers.⁷ I call this the "Structuralist Innovation Presumption." Notably, this presumption seems to have played a pivotal role in the recent *Google Android* decision (although the text of the Commission's decision is not yet publicly available).⁸

In what follows I argue that the Structuralist Innovation Presumption is a misguided heuristic that antitrust authorities around the globe would do well to avoid. Although it has been almost unequivocally endorsed by

2 See J.A. SCHUMPETER, *CAPITALISM, SOCIALISM AND DEMOCRACY* 72 (1976).

3 See Kenneth Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in *THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS* 620 (Richard R. Nelson ed., 1962).

4 See, e.g. Philippe Aghion, Nick Bloom, Richard Blundell, Rachel Griffith & Peter Howitt, *Competition and Innovation: An Inverted-U Relationship*, 120 Q. J. ECON. 702 (2005).

5 See generally *INDUSTRIAL CONCENTRATION: THE NEW LEARNING* (Harvey J. Goldschmid, H. Michael Mann, and J. Fred Weston eds., 1974), and see especially Harold Demsetz, *Two Systems of Belief About Monopoly*, in *id.* at 164-184. See also Sam Peltzman, *The Gains and Losses from Industrial Concentration*, 20 J. L. & ECON. 229 (1977); Yale Brozen, *The Concentration-Collusion Doctrine*, 46 ANTITRUST L. J. 826 (1978).

6 See, e.g. Michael L. Katz & Howard A. Shelanski, *Mergers and Innovation*, 74 ANTITRUST L. J. 1, 22 (2007) ("The literature addressing how market structure affects innovation (and vice versa) in the end reveals an ambiguous relationship in which factors unrelated to competition play an important role.").

7 These cases are discussed throughout Section 2 of this paper, *infra* at p. 2, ff.

8 *Infra* note 19.

the European Commission, the presumption is at odds with the mainstream economics of innovation.⁹ To make matters worse, structuralist innovation also ignores the complex second-order effects that may arise when antitrust intervention tampers with rapidly evolving markets.

II. “STRUCTURALIST INNOVATION” AND EUROPEAN COMPETITION LAW

The concept of structuralist innovation is best illustrated in a recent speech, given by European Commissioner for Competition Margrethe Vestager. Speaking of the *Google Shopping* case, she surmised that “[Google’s Behavior] got in the way of the competition that drives innovation forward. . . . [B]y making sure these markets are open for competition, our decision will help innovation to thrive.”¹⁰ Her conclusion is clear: More competition on the market leads to more innovation.

In the *Google Shopping* decision, the Commission found that Google’s conduct decreased both its own and its rivals’ incentives to innovate. It notably concluded that “the conduct is likely to reduce the incentives of Google to improve the quality of its comparison shopping service as it does not currently need to compete on the merits with competing comparison shopping services.”¹¹ The implication is clear: Google would innovate only if it faced competition from rivals within the market (in this case, the market for comparison shopping services). The Commission thus excludes the possibility that “for the market” competition or competition from firms outside the relevant market would provide sufficient incentives to innovate in the market for comparison shopping.

Commissioner Vestager did not conjure her words, nor the Commission’s *Google Shopping* decision, out of thin air. Indeed, the idea that competitive market structures lead to innovation has long been a mantra of the European Commission in its competition decisions. In *Microsoft*, for example, the Commission found that Microsoft’s refusal to supply interoperability information to downstream rivals would limit technical development because “new products other than Microsoft’s work group server operating systems will be confined to niche existences or not be viable at all. There will be little scope for innovation – except possibly for innovation coming from Microsoft.”¹² Although adduced without evidence, the Commission’s message is clear: Product market competition and diversity inevitably lead to more and better innovation than if a single firm is left to itself.

The Commission adopted the same assumption in the *Groupement des Cartes Bancaires* decision.¹³ In *Cartes Bancaires* the Commission determined that a set of measures put in place by members of a payment card network would reduce the entry of new firms into the network. In the Commission’s own words, this had the effect of “stifling innovation (in so far as new entrants would have supplied cards with new functions).”¹⁴ Yet the Commission provided no additional evidence to support the claim that entrants would have provided new products and services (nor, *a fortiori*, what those new products and services would be or whether they would be particularly innovative or successful).

Similarly, in *Intel*, the Commission found that innovation was harmed because potentially more efficient rivals had been foreclosed and could therefore not provide innovative products.¹⁵ The Commission further noted that Intel’s behavior deprived “AMD and its investors of a return

9 This is not to say that some economists do not believe that more competitive market structures generally lead to more innovation. But rather that these writings have (i) not garnered a wide consensus among the economics profession, and (ii) often rest on narrow assumptions that reduce their application to specific settings. See, e.g. Carl Shapiro, *Competition and Innovation: Did Arrow Hit the Bull’s Eye?*, in *THE RATE AND DIRECTION OF INVENTIVE ACTIVITY REVISITED* 400 (Josh Lerner and Scott Stern eds., 2011). See also Ilya Segal & Michael D. Whinston, *Antitrust in Innovative Industries*, 97 *AM. ECON. REV.* 1712 (2007). For instance, both of the above papers conclude that exclusivity, though it may increase innovator’s *ex-post* profits, is unlikely to increase incentives to innovate because it prevents entry by more innovative rivals. To reach this conclusion, the authors notably assume that consumers that are bound by exclusivity contracts never find it profitable to purchase the innovation of a second firm (they assume the innovation costs more to produce than the value to consumers of its incremental improvement). There is no reason to believe that this is, or is not, a good reflection of reality.

10 See Speech by Margrethe Vestager, “Clearing the path for innovation,” Lisbon Web Summit (Nov. 7, 2017), available at https://ec.europa.eu/commission/commissioners/2014-2019/vestager/announcements/clearing-path-innovation_en.

11 See Commission Decision No. AT.39740 (*Google Search (Shopping)*), C(2017) 4444 final, slip. op., §594-595 (June 27, 2017). The Commission also found that “competing comparison shopping services will have an incentive to invest in developing innovative services [...] only if they can reasonably expect that their services will be able to attract a sufficient volume of user traffic to compete with Google’s comparison shopping service.”

12 See Commission Decision No. COMP. 37792 (*Microsoft*), C(2014) 900 final, slip. op., §700 (March 24, 2004).

13 See Commission Decision No. COMP.38606 (*Groupement des Cartes Bancaires “CB”*) 2001 O.J. L. 162/21.

14 *Id.* at §476.

15 See Commission Decision No. COMP. 37990 (*Intel*), D(2009) 3726 final, slip. op., §1612 (May 13, 2007).

on their research and development investments which would have been proportionate to the success of their inventions.”¹⁶ The decision does not discuss whether AMD’s innovations would have been superior to Intel’s, nor does it present any evidence to suggest that pressure from AMD would have increased innovation by Intel. In fact, empirical research produced after the decision suggests that the presence of competitors, such as AMD, may actually *decrease* innovation in the microprocessor industry.¹⁷ The list of Commission decisions goes on...¹⁸

Most recently, the structuralist innovation theory appears to have had a significant influence over the Commission’s *Google Android* decision. The Commission’s press release notes that “[t]his practice reduced the opportunity for devices running on Android forks to be developed and sold... Therefore, Google’s conduct has had a direct impact on users, denying them access to further innovation and smart mobile devices based on alternative versions of the Android operating system.”¹⁹

The commonality between these decisions is readily apparent. The Commission assumes that reducing the number of rival firms in a market will, by the same token, also harm innovation. Moreover, the Commission rationalizes these conclusions with broad, ideologically-driven statements, rather than detailed assessments of the underlying market realities in each case. In short, according to the Commission’s decisions, it is systematically the case that fewer firms in a market will produce less innovation, to the detriment of consumers.

III. A PRESUMPTION AT ODDS WITH ECONOMIC SCIENCE

Some readers may be asking... So what is the big deal? Is it not obvious that more competition and greater diversity leads to more innovation? The answer to this question hinges on a crucial distinction between competition *for the market* and competition *in the market*.

On some basic level, the idea that competition is a key driver of innovation is undoubtedly true. Ever since the writings of Schumpeter, it has been uncontroversial that competition to attract consumers may spur firms to innovate. In this light, the invention of the automobile can be seen as a competitive response to horses; consumer air travel initially vied for the same consumers that used trains and boats; etc. As Schumpeter wisely observed, this type of creative destruction is not necessarily the fruit of old incumbents.²⁰ Instead, it is often down to aspiring firms that seek to displace the incumbent, rather than languish in its shadow.

This vision is one of competition *for the market*, where monopoly power is transitory, and where firms compete to overthrow incumbents, potentially moving industries towards new standards or paradigms in the process.²¹ This is not to say that incumbents cannot also be highly innovative, but rather that (i) entrants do not need to be present in a market before they innovate, or induce innovation by incumbents; and (ii) it is not clear what competition authorities (or entrenched incumbents, for that matter) can do to manage (or prevent) this type of innovation. To take just one of innumerable examples: Blackberry was unable to prevent Apple from disrupting its business, even though Apple had never sold a mobile handset before the iPhone, and Blackberry had a commanding position on the market.²²

Although competition *for the market* is frequently a crucial driver of innovation, it is only tangentially addressed by current antitrust regimes. Instead, these laws tend to focus more heavily on competition within well-defined markets — that is, on competition *in the market*.²³ In that regard, the indicia of competition upon which current antitrust regimes tend to focus may, when considered within the context of innovation, point in the wrong direction. Indeed, whereas competition *for the market* is a key driver of innovation, it does not follow that ever-more compe-

16 *Id.* at §1614.

17 See Ronald L. Goettler & Brett R. Gordon, *Does AMD Spur Intel to Innovate More?*, 119 J. POL. ECON. 1141 (2011).

18 See, e.g. Commission Decision No. COMP. 39525 (*Telekomunikacja Polska*), slip. op. (June 22, 2011), §830 & 902; Commission Decision No. AT. 39523 (*Slovak Telekom*), C(2014) 7465 final, slip. op. (October 15, 2014), §1053.

19 See European Commission, “Antitrust: Commission fines Google €4.34 billion for illegal practices regarding Android mobile devices to strengthen dominance of Google’s search engine,” (Jul. 18, 2018), available at http://europa.eu/rapid/press-release_IP-18-4581_en.htm.

20 See J.A. SCHUMPETER, *THE THEORY OF ECONOMIC DEVELOPMENT: AN INQUIRY INTO PROFITS, CAPITAL, CREDIT, INTEREST, AND THE BUSINESS CYCLE* 66 (1934) (“On the contrary, new combinations are, as a rule, embodied, as it were, in new firms which in general do not arise out of the old ones but start producing beside them... in general it is not the owner of stage-coaches who builds railways.”).

21 See, e.g. David J. Teece, *Strategies for Managing Knowledge Assets: The Role of Firm Structure and Industrial Context*, 33 LONG RANGE PLANNING 47 (2000).

22 See Vlad Savov, *BlackBerry’s Success Led to Its Failure*, THE VERGE (Sep. 30, 2016), <https://www.theverge.com/2016/9/30/13119924/blackberry-failure-success>.

23 See William M. Landes & Richard A. Posner, *Market Power in Antitrust Cases*, 94 HARV. L. REV. 960 (1981).

tion in each and every market is necessary, or even desirable, to achieve the optimal rate of innovation in an economy. As Harold Demsetz has put it: “Once perfect knowledge of technology and price is abandoned, [competitive intensity] may increase, decrease, or remain unchanged as the number of firms in the market is increased. . . . [I]t is presumptuous to conclude. . . . that markets populated by fewer firms perform less well or offer competition that is less intense.”²⁴

In the more circumscribed realm of antitrust law, and competition *in the market*, economists have long fretted over the type of market structure that would be most conducive to the production of innovations. The Schumpeterian view suggests that monopolies are naturally better suited to innovating because they have superior access to capital and, presumably, are not hampered by the free-riding that plagues competing innovators.²⁵ In turn, these monopolies compete against each other to create new markets and disrupt existing ones.²⁶ At the other end of the spectrum, Arrow considered that competitive market structures are indeed necessary for firms to produce the second-best rate of innovation (according to him, markets necessarily produce suboptimal incentives to innovate, prompting a stern rebuttal from Harold Demsetz).²⁷ Taking a more empirical perspective, the endogenous growth scholars have shown that intermediate market structures tend to produce higher rates of innovation, though endogenous factors affect the optimal market structure in any given case, and optimal firm size changes over time.²⁸

Do any of these views support the Commission’s Structuralist Innovation Presumption? The answer is clearly no. Take the point of view that is most favorable to the Commission’s position. Arrow did indeed suggest that perfectly competitive markets would produce more innovation than monopolies.²⁹ But the story did not stop there. Because the prospect of monopoly profits was necessary to spur these competitors to innovate, Arrow was immediately faced with a time consistency problem. *Ex-ante*, a benevolent social planner would want to give the winning innovator a monopoly over its creation, but *ex-post* the same planner would remove all protections in order to spur further innovation.³⁰ Under Arrow’s model, an economy where perfect competition is enforced in every market would produce no innovation whatsoever. Moreover, his model ignores the potential for firms active in different markets to compete against each other and introduce innovations in markets that are yet to be created or in which they don’t yet compete. When this is the case, a monopolist (either threatened by entry or vying to enter an unrelated market) will act as a firm in a “competitive” market would, because innovating does not cannibalize its current sales.³¹ In short, promoting innovation is a balancing act that is simply incompatible with the idea that atomistic market structures invariably increase innovation.

IV. APPROPRIABILITY: A MORE SOPHISTICATED TOOL

As soon as the time consistency problem is considered, authorities must contend with a significant challenge. Not only must they seek to protect competition, but they must also ensure that their interventions do not chill innovation by preventing firms from earning a positive expected return on their inventions. Whether firms will be able to do so notably hinges on appropriability – that is, the extent to which an innovator can capture the social benefits of its innovation. The higher the level of appropriability, the more likely a firm is to earn a positive return on its investments in innovation.

24 See Harold Demsetz, *The Intensity and Dimensionality of Competition*, in HAROLD DEMSETZ, *THE ECONOMICS OF THE BUSINESS FIRM: SEVEN CRITICAL COMMENTARIES* 137, 140-41 (1995).

25 See Schumpeter, *supra* note 2, at 72, 91 & 396.

26 See Schumpeter, *supra* note 20, at 66.

27 See Arrow, *supra* note 3, at 620. See also Harold Demsetz, *Information and Efficiency: Another Viewpoint*, 12 J. L. & Econ. 19 (1969) (arguing that, under modest changes in assumptions, monopoly is more favorable to innovation and that antitrust law should thus be pursued less diligently).

28 See Aghion et al., *supra* note 4, at 702 (“The essence of the inverted-U relationship between competition and innovation is that the fraction of sectors with neck-and-neck competitors is itself endogenous, and depends upon equilibrium innovation intensities in the different types of sectors.”). See also Robert E. Lucas Jr., *On the Size Distribution of Business Firms*, BELL J. Econ. 508 (1978). (showing that average size of firms increases with GDP. This is because a firm’s size is a reflection of economic agents’ ability to manage, and because more advanced economies are better at fostering the human capital necessary to produce good managers.). The upshot is that the relationship between industry concentration and innovation might be expected to veer further towards large firms as economies continue to grow.

29 See Arrow, *supra* note 3, at 620.

30 *Id.* at 617 (“[I]n a free enterprise economy the profitability of invention requires a nonoptimal allocation of resources.”).

31 The importance of this incremental increase in post-innovation rents, rather than *ex-ante* market structures, was notably stressed by Aghion and his co-authors. See Aghion et al., *supra* note 4, at 702 (“Innovation incentives depend. . . upon the difference between postinnovation and preinnovation rents of incumbent firms.”).

The notion of appropriability, at least as is it currently understood, owes a great debt to the works of David Teece. In a seminal paper, Teece showed that appropriability is affected not just by intellectual property but by a wide array of other factors.³² These include the ease with which rivals can copy or reverse-engineer an innovation, whether the knowledge that underpins it is tacit or codified, and whether the innovator owns complementary assets, among others.³³ Teece's work also provides another critical insight: appropriability is not given by nature; instead it is up to firms to shape their business environment so as to earn a return on their inventions.

Firms' attempts to generate appropriability for themselves will inevitably raise competition issues, as protecting their profits will generally imply the exclusion of at least some potential competitors. For example, keeping an innovation secret may prevent a firm's rivals from using the underlying information to compete against it in the market. Likewise, using monopoly power over a complementary good to make an innovation profitable implies that rivals may be excluded from both the monopoly market and the innovation market (the latter because they may not have access to a complementary good in order to generate some appropriability). It is this sort of appropriability through complementary goods that was at stake in the Commission's *Google Android* decision.³⁴

Accordingly, policymakers must decide whether firms should be given some leeway to engage in nominally anticompetitive conduct when this increases appropriability over their innovations, or whether this type of exclusion is solely the domain of intellectual property protection.³⁵ The abundant empirical literature on this topic is unambiguous: Except for some patent-heavy industries like pharmaceutical and chemical goods, intellectual property protection is far from being the most important source of appropriability for innovators.³⁶ Instead, firms tend to rank lead-time and secrecy as being more important than patents. Owning complementary assets is also high on the list of appropriability mechanisms.³⁷

The upshot is that, based on our current understanding of economic science, it is impossible to identify a single type of market structure that is strictly superior at producing innovations.³⁸ On the contrary, the optimal setting for innovation depends upon numerous factors, most notably the way in which firms in each industry manage to appropriate the benefits of their innovations. These appropriation strategies will inevitably affect a market's structure. Authorities thus cannot dismiss the possibility that, in some cases at least, tolerating behavior that increases a market's concentration will also foster innovation, because the increased concentration is a direct consequence of firms' appropriability decisions. The Commission's Structuralist Innovation Presumption ignores this complex interplay.

V. THE PROBLEM OF SECOND ORDER EFFECTS: THE *GOOGLE ANDROID* DECISION

Even if the Commission's Structuralist Innovation Presumption was in line with the mainstream economics of innovation – and it is not – it would still likely fail as a heuristic for antitrust decision-making. As Schumpeter famously noted (referring to the notion that competitive market structures produce more innovation): “The conclusions. . . are almost completely false. Yet they follow from observations and theorems that are almost completely true.”³⁹ Schumpeter's point is that the world is infinitely more complex than an economic model, and it is rarely possible for authorities to modify a single parameter of competition without giving rise to complex second-order effects. Unlike economic models, antitrust authorities cannot maintain other things equal when they operate. Once these secondary effects are accounted for, it becomes even more speculative to suggest that atomistic market structures necessarily increase innovation.

32 See David J. Teece, *Profiting From Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy*, 15 RESEARCH POL'Y 285 (1986).

33 *Id.*

34 See Dirk Auer, *Appropriability and the European Commission's Android Investigation*, 23 COLUM. J. EUR. L. 647 (2017).

35 Even then, they also need to decide when business conduct surrounding IP itself is problematic, most obviously in the context of standard setting organizations and SEPs. See, e.g. Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991 (2006).

36 See Edwin Mansfield, *Patents and Innovation: An Empirical Study*, 32 MANAGEMENT SCI. 175-176 (1986). See also Richard C. Levin, Alvin K. Klevorick, Richard R. Nelson, Sidney G. Winter, Richard Gilbert & Zvi Griliches, *Appropriating the Returns From Industrial Research and Development*, 1987 BROOKINGS PAPERS ON ECON. ACTIVITY 797 (1987); Najib Harabi, *Appropriability of Technical Innovations an Empirical Analysis*, 24 RESEARCH POL'Y 981 (1995).

37 See Wesley M. Cohen, Richard R. Nelson & John P. Walsh, *Protecting Their Intellectual Assets: Appropriability Conditions and Why US Manufacturing Firms Patent (Or Not)*, No. w7552 NBER 5 (2000).

38 See Katz & Shelanski, *supra* note 6, at 14 (“[T]he linkage between *current* concentration and *future* price and output competition and resulting welfare may be weak in some circumstances, notably when there is significant, ongoing innovation. This is so because innovation may be unrelated to the concentration of current sales and may make future market structures hard to predict. In other words, in markets in which innovation is significant, the traditional concentration-competition relationship is on a weaker or more nuanced empirical and theoretical footing than otherwise.”).

39 See Schumpeter, *supra* note 2, at 72.

Take the European Commission's recent *Google Android* decision.⁴⁰ In a nutshell, the Commission found that Google restricted competition on the market for Android forks and that this reduced innovation from competing forks. Google is notably said to have withheld access to the Play Store App for firms that produced "incompatible" Android forks.⁴¹ I have written elsewhere that Google's behavior might simply have been a way to increase the appropriability of investments in the Android operating system.⁴² But there is another argument to be made against the Commission's decision.

Imagine that the Commission gets its wish, and the Android ecosystem effectively moves from a model where Google's rivals face some limits on the forks they can produce to one where these firms can produce whichever fork they see fit without any penalty from Google. Even if one assumes that more competitive market structures lead to more innovation, and that the Commission's move has effectively made the market for Android forks more competitive, it is still impossible to tell whether innovation will increase as a result.

For instance, naïvely applying basic models of innovation ignores the fact that fragmenting the market for Android forks will undoubtedly have some effect, be it positive or negative, on the incentives of developers to join the Android platform. As things stand, there are roughly the same number of apps on the Google Play Store as there are on Apple's App Store.⁴³ Nothing guarantees that this will still be the case if the Android ecosystem becomes heavily fragmented, however.⁴⁴ In turn, this could have significant ramifications for innovation in the market for forks. Mobile operating systems can be analyzed as two-sided platforms that allow app developers and users to meet.⁴⁵ Reducing the number of developers that produce software for a platform necessarily reduces its attractiveness for users. There is thus a very real risk that fragmenting the Android ecosystem will not lead to more innovation, as the Commission hopes, but that it may instead cause the entire ecosystem to unravel, leaving consumers with even less choice and innovation than is currently the case.⁴⁶

The idea that the Android ecosystem could collapse might seem improbable, but readers need look no further than the market for game consoles for an example of a successful platform disintegrating. It took just two generations of consoles (less than a decade) for Sega to go from producing the highest-selling game console in the U.S. to completely exiting the console market.⁴⁷ Though the causes of its demise are complex, one of Sega's biggest mistakes was releasing its Saturn console without any developer support in the U.S. and European markets.⁴⁸ This gave the upper hand to Sony and its PlayStation, and Sega never recovered. There is little doubt that a highly fragmented Android operating system could readily face this same existential threat.

40 See Commission Press Release, "Antitrust: Commission fines Google €4.34 billion for illegal practices regarding Android mobile devices to strengthen dominance of Google's search engine," (Jul. 18, 2018), available at http://europa.eu/rapid/press-release_IP-18-4581_en.htm.

41 *Id.* ("Google has prevented device manufacturers from using any alternative version of Android that was not approved by Google (Android forks). In order to be able to pre-install on their devices Google's proprietary apps, including the Play Store and Google Search, manufacturers had to commit not to develop or sell even a single device running on an Android fork.").

42 See Auer, *supra* note 34, at 647.

43 See *Number of Apps Available in Leading App Stores as of 3rd Quarter 2018*, STATISTA.COM (last visited, Nov. 25, 2018), <https://www.statista.com/statistics/276623/number-of-apps-available-in-leading-app-stores/>.

44 The Android app developer community has decried the Commission's decision for this very reason. See Developers Alliance, "App Developer Letter to the Commission: Don't Undermine Progress!," available at <https://www.developersalliance.org/open-letter-eu-govt/> ("[E]arly Android was a mess. Because it was open source and many manufacturers were heavily customizing Android, our apps were breaking or not rendering correctly, and we were having to test apps on dozens of devices and rewrite them for all of the 'Androids.' ... Fortunately Google heard this frustration and invested in efforts to harmonize Android.").

45 See Marc Rysman, *The Economics of Two-Sided Markets*, 23 J. ECON. PERSP. 129 (2009). More generally, see Jean-Charles Rochet & Jean Tirole, *Two-Sided Markets: A Progress Report*, 37 RAND J. ECON. 645 (2006).

46 See, e.g. Julian Morris, *The European Commission's Google Android Decision Takes a Mistaken, Ahistorical View of the Smartphone Market*, TRUTH ON THE MARKET (Jul. 23, 2018), <https://truthonthemarket.com/2018/07/23/the-european-commissions-google-android-decision-takes-a-mistaken-ahistorical-view-of-the-smartphone-market/>.

47 See Ryan Lamble, *The Death of Sega's Consoles: History's Warning*, DENOFGEEK (Jan. 29, 2008), available at <https://www.denofgeek.com/games/11565/the-death-of-segas-consoles-historys-warning>.

48 See Keith Stuart, *Sega Saturn: How One Decision Destroyed PlayStation's Greatest Rival*, THE GUARDIAN (May 14, 2015), available at <https://www.theguardian.com/technology/2015/may/14/sega-saturn-how-one-decision-destroyed-playstations-greatest-rival>.

All of this is not to say that the Android ecosystem is certain to unravel in the wake of the European Commission's decision. Instead, this example merely illustrates that authorities must contend with a series of complex second-order effects before they can conclude that making a market “more competitive” will improve innovation — and, in fact, make the market more competitive. Complex market realities thus further undermine the European Commission's Structuralist Innovation Presumption.

VI. CONCLUDING REMARKS

It is important to understand the limits of the claims discussed here: Just as there is no reason to believe that more-atomistic market structures are systematically more conducive to innovation than concentrated ones, it is equally uncertain that monopolies are necessarily superior. Rather, the crucial point is that a sound reading of economic science calls for meticulous assessments in actual cases to determine whether restrictions on a firms' practices will improve or hamper innovation. Unfortunately, this is contrary to the Commission's practice in its recent decisions. And although this may seem like a daunting task, it is better than the alternative, which is to rely on presumptions that have no basis in either theoretical science or fact.

Policymakers on both sides of the Atlantic are currently in the midst of high-profile hearings to determine how competition law should be applied in the 21st century.⁴⁹ A central theme of these consultations is the question of how antitrust authorities should deal with the fast-moving world of digital platforms, and how they can protect consumers without harming innovation. If these hearings are a sign of things to come, then the interplay between competition law and innovation is set to play an increasing role in future competition proceedings. In that regard, this paper suggests that authorities concerned with safeguarding innovation should at all costs steer clear of naïve heuristics such as the EU's Structuralist Innovation Presumption. Although applying this type of presupposition might initially make enforcers' lives easier, reducing the burden of proof they must meet to show anti-innovative effects would turn successfully prosecuted cases into pyrrhic victories. Intervention risks doing more harm than good by shackling firms' ability to offer consumers the best possible products. A more nuanced approach is thus required.

49 See European Commission, “Call for contributions: Shaping competition policy in the era of digitization,” (2018), available at <http://ec.europa.eu/competition/scp19/> (last visited Nov. 21, 2018); Federal Trade Commission, “FTC Announces Hearings On Competition and Consumer Protection in the 21st Century” (Jun. 20, 2018), available at <https://www.ftc.gov/news-events/press-releases/2018/06/ftc-announces-hearings-competition-consumer-protection-21st> (last visited Nov. 21, 2018).

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