Organisation for Economic Co-operation and Development

DAF/COMP/WD(2023)56

Unclassified

English - Or. English

2 June 2023

DIRECTORATE FOR FINANCIAL AND ENTERPRISE AFFAIRS
COMPETITION COMMITTEE

# The Relationship between Competition and Innovation – Note by BIAC

14 June 2023

This document reproduces a written contribution from BIAC submitted for Item 4 of the 140th OECD Competition Committee meeting on 14-16 June 2023.

More documents related to this discussion can be found at https://www.oecd.org/competition/the-relationship-between-competition-and-innovation.htm

Antonio CAPOBIANCO
Antonio.Capobianco@oecd.org, +(33-1) 45 24 98 08

JT03520559

# *BIAC*

## 1. Introduction

1. *Business at OECD* (BIAC) is pleased to provide this contribution to the Hearing on the Relationship Between Competition and Innovation. Competition and innovation are two important drivers of economic growth and development. Competition drives firms to improve, among other things, efficiency and productivity, while innovation helps firms to create new products, services, and processes that meet the changing needs and preferences of consumers. BIAC has previously explored the impact of disruptive innovation on competition,[1] as well as the intersection of competition and innovation in specific industries,[2] and the associated issues regarding enforcement.[3]

2. This submission will not explore in detail how innovation is considered in competition enforcement.[4] Indeed, BIAC observes that competition agencies are not responsible for innovation *per se*, and it is not the role of agencies to try to artificially create innovative marketplaces.[5] However, as previously stated, BIAC is of the view that antitrust policy should contemplate innovation and be ready to accommodate novel business models and incentivise innovation.[6]

3. As observed by the Secretariat, there is indeed no theoretical consensus on the precise relationship between competition and innovation, and especially regarding "cause and effect," i.e., that increased competition in any industry will drive a corresponding increase in innovation (or vice-versa).[7] In fact, policies and regulatory action that seek to establish or maintain this causal relationship can sometimes have the opposite effect, harming or holding back innovation in the process. Due to the multi-faceted nature of innovation, a detailed analysis is required in any given case into the precise nature of the

[1] OECD, Hearing on Disruptive Innovation – Note by BIAC, DAF/COMP/WD(2015)48 (June 12, 2015), https://one.oecd.org/document/DAF/COMP/wd(2015)48/En/pdf [hereinafter BIAC Note on Disruptive Innovation].

[2] OECD, Hearing on Disruptive Innovation in the Financial Sector – Note by BIAC, DAF/COMP/WP2/WD(2015)15 (Oct5. 20, 2015), https://one.oecd.org/document/DAF/COMP/WP2/WD(2015)15/en/pdf [hereinafter BIAC Note on Disruptive Innovation in the Financial Sector].

[3] OECD, The Impact of Disruptive Innovation on Competition Law Enforcement – Contribution from the Business and Industry Advisory Committee, DAF/COMP/GF/WD(2015)45 (Oct. 21, 2015), https://one.oecd.org/document/DAF/COMP/GF/WD(2015)45/En/pdf.

[4] As directed by the Secretariat, this paper will not explore how innovation is considered in competition enforcement, i.e., what are the relevant theories of harm or the standard of proof in innovation cases, be those mergers or regulated conduct cases.

[5] Al Barbarino, FTC's Khan Says Antitrust Laws Favor 'Building Over Buying', LAW360 (Apr. 26, 2023), https://www.law360.com/articles/1601402 (quoting Federal Trade Commission Chair Lina Khan, "The FTC is not in the business of picking and choosing which mergers allow innovation.").

[6] BIAC Note on Disruptive Innovation in the Financial Sector, supra note 2, at ¶ 4.

[7] OECD, Competition and Innovation: A Theoretical Perspective – OECD Competition Policy Roundtable Background Note 5 (2023), https://www.oecd.org/daf/competition/competition-and-innovation-a-theoretical-perspective-2023.pdf.

innovation at stake and also the incentives to innovate (and whether those incentives are restricted).

4. Competition is but one of many factors that drive innovation and promoting competition is not the best or only method of achieving this goal. Other key factors also play an important role in driving innovation. These include technological development, incentives for investment, demand conditions, and exogenous factors such as education and globalization. Competition policy should seek to enhance and not preclude the positive impacts of these factors on both innovation and competition.

## 2. The Importance of Innovation

5. No one can doubt the importance of innovation, which is a key driver of economic growth and development. Innovation refers to the creation and implementation of new products, services, processes, and technologies that improve efficiency, productivity, and overall output in an economy. Innovation plays a crucial role in the development of new industries and markets, and in the transformation of existing industries.

6. Traditionally, increasing output in an economy was thought to only occur in two ways:

- *Increasing inputs*. If the mechanics of the economy remain the same, and the number of inputs increases, the necessary consequence is increased outputs.
- *Generating more outputs from the same inputs*. A more efficient process can better exploit its inputs than a less efficient system.

7. In the mid-1950s, Abramovitx and Solow conducted studies that served as a turning point in the modern study of output. Abramovitx measured the growth in output of the American economy between 1870 and 1950 and also measured the growth in inputs (capital and labour) over the same time period. He found that increased inputs accounted for only 15% of economic growth, while the remaining 85% was *inexplicable* at the time.[8] Solow undertook a similar study using a different methodology and different time period. His study resulted in an identical residual finding of 85%. The missing percentage was eventually attributed to technological innovation.[9]

8. Building on this breakthrough and in an effort to track technological innovation, researchers used the quantity and quality of patent filings as a measure of innovation over a given time. They found that periods of breakthrough innovation in patents successfully predicted watershed inventions and individual firm profits, suggesting that innovation may be key to understanding the last two centuries of economic growth.[10]

9. Economic theorists have identified the range of economic benefits of innovation. These can go beyond increases in productivity and efficiency. Innovation can:

- *Establish or foster the creation of new industries and markets*. Innovation can lead to the creation of new industries and markets, which can drive economic growth and development. For example, the development of the Internet and mobile

[8] Nathan Rosenberg, Innovation and Economic Growth (2004), https://www.oecd.org/cfe/tourism/34267902.pdf.

[9] Id.

[10] How Much Does Innovation Drive Economic Growth?, KelloggInsight (Mar. 4, 2019), https://insight.kellogg.northwestern.edu/article/measuring-innovation-patents-productivity.

technology has created new industries, such as e-commerce and app development, that have transformed the way we live and work.

- *Increase and attract new investment*. Innovation can attract investment from both domestic and foreign sources, as investors seek out firms that are at the forefront of new technologies and trends. This can help to boost economic growth and development.
- *Create new employment opportunities*. Innovation can create new jobs and opportunities as firms seek skilled workers to develop and implement new products, services, and technologies. This can help to reduce unemployment and boost economic growth.
- *Improve quality of life.* Innovation can improve the quality of life for citizens by creating new products and services that address certain social, environmental, and economic challenges. For example, innovations in healthcare and renewable energy can improve health outcomes and reduce the impact of climate change.
- *Increase competitiveness*. Finally, innovation can help firms to differentiate their products and services from those of their competitors and to stay ahead of the competition. This often means that some industries left to their natural growth arcs will become competitive *because* of innovation.

10. Innovation is a multi-faceted phenomenon and includes break-through innovations, follow-on innovations, etc. It may originate from companies themselves, their suppliers, users, consumers or, more generally, the ecosystem.

11. The transformative benefits of innovation have most widely been seen in the technology sector. The development of new technologies (e.g., cell phones, computers, Internet, etc.) has not fit the mold of the systems that were previously in place and required industry leaders to re-examine their industries.

12. Technological innovation has in turn transformed other industries. The tourism industry provides but one example of such transformative change. Before the advent of the Internet, in order to travel, one needed to contact a travel agent. Now, anyone can book a trip themselves without any particular skillset or access to the services of a travel agent. The innovative technology that makes up Internet booking services did not simply enhance the travel industry – it completely changed it, thus opening up the tourism booking industry to more firms and increased competition. In this regard, technological innovation broke down barriers of entry to participation in the industry, and the competitive dynamics and workings of an entire industry naturally changed without regulatory intervention.[11]

13. The broad and potentially transformative benefits of innovation demonstrate that innovation does not always depend on competition in order to flourish.

## 3. The Relationship Between Competition and Innovation

14. The relationship between competition and innovation is complex. It is not necessarily directionally consistent in terms of "cause and effect." It is also not always correlated in terms of intensity.

[11] As discussed below, these findings are enmeshed in Schumpeter's concept of Creative Destruction (discussed below), in which economic growth is spurred by new technologies replacing older technologies.

15. One study modelled an "inverted-U relationship" when discussing how competition impacts innovation. The study found that laggard firms are discouraged from innovating during peak competition but firms competing more "neck-and-neck" innovate at a higher rate. Firms that are far ahead of the pack may not feel the urge to innovate, because they are not being pushed by a directly competitive counterparty.[12] This suggests that the relationship between competition in a market and innovation is not linear and may depend on factors such as the specific competitive position of firms. Put differently, higher levels of competition in a market may not lead to greater innovation, holding all else equal.

16. Another study, performed by representatives of the Austrian Patent Office and KOF Swiss Economic Institute, found that invention quality and the development of innovative products is positively mediated by access to international markets and the competition therein. Particularly, non-price factors such as first-mover advantages, lead-time and services spur innovation more than price-driven competition.[13] This study aligns with the aforementioned Kellogg study in which a higher quantity and higher quality of patent filings successfully predicted economic growth. Taking the studies together indicates that competition found in international markets can promote economic growth.

17. While the above studies indicate a clear practical relationship between competition and innovation, there continues to be considerable theoretical debate as to the precise relationship between the two. Joseph Schumpeter and Kenneth Arrow provide two opposing economic positions regarding the relationship between competition and innovation.[14] Their debate, spread over approximately two decades, continues to provide leading perspectives on the topic today.

18. Schumpeter proposes that competitive markets are not a recipe for efficiency and innovation. Contrary to prevailing scholarship in the 1940s, Schumpeter believed that competition is not the superior form of market organization to create social value, but rather that "creative destruction" was the most powerful force to propel economic progress.[15]

19. According to Schumpeter, a monopolist has higher incentives and also greater funds to innovate than a small firm. A monopoly can only stay a monopoly if it innovates and finds new methods, markets, and forms. Schumpeter recognized that this type of sustaining innovation does not immunize a firm from disruptive innovation – this caused him to introduce the concept of "creative destruction" in which new technologies repeatedly replace older ones, leading to higher economic growth than simple price competition. He further proposed that competition and antitrust law should promote such creative destruction by reducing barriers to entry.

20. Arrow, by contrast, posited that a monopolist has less incentive to innovate as compared to firms in a competitive market because the monopolist's existing profits create a greater opportunity cost of innovating, therefore discouraging research and development

[12] Philippe Aghlion, Nick Bloom, Richard Blundell, Rachel Griffith & Peter Howitt, Competition and Innovation: An Inverted-U Relationship, 120 Q. J. Econ. 701 (2005), available at https://dash.harvard.edu/bitstream/handle/1/4481507/aghion_invertedu.pdf.

[13] Id.

[14] Richard J. Gilbert, Innovation Matters: Competition Policy for the High-Technology Economy, at Ch. 3 – Competition and Innovation Basics: Arrow versus Schumpeter (The MIT Press, 2020), available at https://direct.mit.edu/books/oa-monograph/chapter-pdf/677394/9780262358637_c000200.pdf.

[15] Id. at 42-43.

expenditure.[16] Arrow takes the position that a monopolist has much more to lose from innovating than a firm engaged in competition and is therefore discouraged from doing so. Thus, whereas Schumpeter views existing profit as a proponent of change, Arrow sees it as an impediment. As a result, Arrow suggests that disruptive innovation – the form of innovation that he maintains is more valuable – is more likely under competitive conditions than monopolistic ones.[17]

21. The Schumpeter/Arrow debate remains alive today. Certain antitrust theorists agree with Schumpeter that regulating in favour of certain competitive dynamics may not always lead to the most innovative outcome.[18] Debates continue around certain remedial measures that are designed specifically to facilitate the competitors of certain companies, including those competitors that may have fallen behind precisely because they had not made the same investments in technology, innovation or product offerings.[19]

22. An example of rules that potentially detract from incentives to innovate are proposals that would ban "self-preferencing" outright. While such rules may restrain gatekeepers and presumably facilitate the ability of their rivals to contest certain markets, there is debate as to the economic benefits of such rules.

> *[T]he Digital Markets Act (DMA) would force a 'gatekeeper' company to provide business users of its service, as well as those who provide complementary services, access to and interoperability with the same operating system, hardware, or software features that are available to or used by the gatekeeper. While this would restrain gatekeepers and presumably facilitate the interests of the gatekeeper's rivals, it is not clear how this would protect consumers, as opposed to competitors.*[20]

23. What is clear from the economic and academic debate regarding the relationship between innovation and competition is that the relationship is complex, and a "one size fits all" approach cannot be adopted across different sectors, industries, or individual economies. Policy and enforcement must be founded on sound economics and be evidence-based, tailored to account not only for the specific circumstances of a market, but also for the myriad of other factors that may drive innovation.

## 4. Other Factors That Drive Innovation

24. While competition is certainly a factor that motivates innovation, it is neither its only, nor necessarily its best, proponent. Some other factors driving innovation include, but are not limited to, technology, investment, regulation, demand conditions as well as other

[16] Aghlion, et al, supra, note 12.

[17] There is debate as to what kind of innovation is best in digital markets: disruptive or sustaining. Disruptive innovation shatters the paradigm in which the market exists and is generally propelled by new market entrants with a simpler but better product than the dominant firm(s). What policy course of action to take that results from both of these approach is still being debated, along with whether regulators should try to spur disruptive, breakthrough, or original innovation as opposed to incremental innovation. See BIAC Note on Disruptive Innovation, supra note 1, at 5-6.

[18] Maureen K. Ohlhausen & John M. Taladay, Are Competition Officials Abandoning Competition Principles? 13 J. Eur. Competition L. & Prac. 463, 465 (2022), available at https://academic.oup.com/jeclap/article-pdf/13/7/463/47684826/lpac033.pdf.

[19] Id.

[20] Id. (internal citation omitted).

exogenous factors. Efforts to promote innovation should be tailored on a case-by-case basis to focus on all of the foregoing factors instead of only competition.

## 4.1. Technology

25. Economic theorists agree that technology is a major force in innovation. Sometimes the subject of innovation is the creation of such technology, and sometimes, as new technology is created, firms incorporate it into different aspects of their businesses in innovative ways. The Internet is a prime example of how technology spurs innovation. Once the Internet started to become ubiquitous, firms began to leverage it to expand their customer base, advertise, coordinate with suppliers, conduct market research, and in countless other ways.

26. A Swedish study suggests that the most important sources of innovations are new technological opportunities, "whether stemming from scientific advances or the diffusion of general-purpose technologies such as microelectronics."[21] However, this is not to say that technology drives innovation completely independently from competitive conditions.

27. As highlighted above, there remains significant debate as to the competitive conditions that may best drive innovation, including the development and adoption of new technologies. As technological innovation becomes increasingly computerized and integrated with artificial intelligence, new technology (for example, a Software as a Service, wherein a firm subscribes to a third-party software provider's service rather than installing it on its own systems) may come with little to no research and development costs for the purchasing firm. Due to the ease of simulation and customization in modern technology, firms can completely alter the landscape of other markets by selling them an innovative product or service. In this regard, innovating by incorporating that new technology is much easier for a dominant firm with significant liquid capital than for a smaller firm. Therefore, while Arrow's stance may apply to the *development* of new technology, it is not as applicable to the *uptake* of existing technology in innovative ways.

28. These perspectives highlight the fact that innovation stemming from technology can occur regardless of the competitive landscape.

## 4.2. Investment

29. Availability of capital, from early-stage financing to large bank loans, is crucial as it grants entrepreneurs and large companies with the financial means needed to pursue innovative ventures. The competitive landscape of an industry becomes irrelevant to innovation if there is no financing enabling innovation to begin with.[22] In the case of debt, if interest rates are low and debt is inexpensive, as it was in 2020 and 2021, both dominant and competitive firms will not face significant financial barriers to innovation.

30. The source of investment capital is not in and of itself an indicator of increased innovation but can indicate the stability and reliability of investments and can be meditated by the risk level of a company. For example, a high-risk company may only receive investment from investors who require a higher rate of return, or more significant security. Since innovation is inherently risky, investment may be harder to come by for highly

[21] Josef Taalbi, What Drives Innovation? Evidence From Economic History, 46 Rsch. Pol'y 1437, 1443 (2017), available at https://www.sciencedirect.com/science/article/pii/S004873331730104X.

[22] Flavio Calvinoa & Chiara Criscuolo, Business Dynamics and Digitalisation (OECD Science, Tech. & Indus. Pol'y Papers, No. 62, 2019), https://doi.org/10.1787/6e0b011a-en.

innovative firms.[23] In light of this reality, high-growth companies have looked to the venture capital market, angel investors, and also considered smaller public offerings in an effort to generate capital to fund certain innovative projects. These types of investors become more risk averse as the economy becomes more *bearish*.

31. In considering the driving forces of innovation in his 2011 paper *What Drives Innovation*, Tom Nicholas discussed how financial markets and innovation intersect:

> *[F]inancial markets play a central role in determining the pace of innovation. Financial intermediaries – such as banks, venture capitalists, private equity firms – redirect capital from where it is being saved to where it is needed. As Schumpeter argued, "risk obviously always falls on the owner of the means of production, or of the money-capital which was paid for them. . ." Financing innovation depends not only on an adequate supply of capital, it also requires efficient contracting to ensure entrepreneurs are productive and that financiers receive a return on their investment. The pace of innovation therefore depends on both the provision of capital and the mechanisms for establishing good governance.*[24]

32. As Nicholas discusses, it is not only the existence of innovation that relies on investment but also the pace of such innovation.

## 4.3. Regulation

33. Firms will always have to conform to changing industry regulation and will often have to innovate to do so. An ongoing example of this push-and-pull is the automotive industry and environmental regulations. As jurisdictions seek to address climate change, automotive manufacturers are forced to innovate and create better, more affordable, and reliable electric vehicle technology. Firms, whether in heavy competition or not, will have to innovate (adopt new technologies, change business practices, etc.) to meet changing environmental regulations.

34. One typical side-effect of innovation in the face of regulation can be price-increases. In the electric vehicle example above, the cost of innovation may be at least partially passed on to consumers – a feature that governments have sought to address through subsidies.

35. Not only do the substantive aspects of regulations impact innovation but so do the procedural aspects. Regulatory barriers and administrative burdens for start-ups, which may include the number of procedures, their length, and the cost needed to register a new company, can impact new, innovative ideas from coming to fruition. Also, avoiding excessive costs of experimentation and failure, and in particular inefficient bankruptcy procedures, promotes innovation.[25]

36. Where regulation involves some form of enforcement, this too may impact the ability of firms to innovate. Investing in innovation typically requires that the investor will receive a clear return on investment (ROI), a measure employed in order to compare the efficiency of different investments. Typically, the greater the risk associated with the

[23] Stephen P. Ferris, Janine S. Hiller, Karen C. Denning & Glenn Wolfe, The Encouragement of Innovation Through Regulation of Equality of Access to the Capital Market, 5 DePaul Bus. L.J. 237 (1993).

[24] Tom Nicholas, What Drives Innovation?, 77 Antitrust L.J. 787, 788 (2011).

[25] Calvinoa & Criscuolo, supra, note 22, at 30.

investment, the greater the return demanded.[26] The uncertainty of enforcement risk can artificially alter the risk/reward ROI calculation, and with it, the level of investment and innovation.

37. While innovation can certainly be a by-product of regulation, it ought not be the primary goal of regulation as it would likely involve somewhat arbitrary guidelines on firms. For example, how would one measure a lack of innovation? How would one evaluate lateral conduct that hinders innovation? How would penalties be assessed? How can counterfactuals be quantified? Since innovation is non-binary, in that there exists more than just "innovative" and "non-innovative" states, determining whether certain innovation regulations are breached would be a very difficult task.

## 4.4. Demand Conditions

38. A firm's products and services must be innovative in order to keep pace with increased demand. New demand can operate somewhat independently from competitive conditions. Innovation may be required by any change in demand conditions. If demand increases, firms must innovate to be able to produce more product or serve more customers with the same inputs. If demand conditions decrease, firms must innovate to generate more revenue from each unit/service in order to stay afloat or risk cutting costs in some fashion.

39. Environmental developments again provide a great example of this factor driving innovation. Innovative forces come from both eco-conscious consumers demanding more environmentally-friendly products and services from firms, and from regulators placing environmental regulations on certain firms and industries. Such concerns/changing environmental regulations will open new business avenues and demands. Innovation increases as the need for environmentally friendly solutions and products increases.[27] These developments may operate independently of competition.

## 4.5. Other Exogenous Factors

40. There are many other exogenous factors that can impact innovation and also a firm's incentives to innovate. These factors are often independent of competition within the industry but can be as impactful on innovation. Some examples of these exogenous factors include demographics of an economy, education, and globalization.

41. Taking "education" as an example, as citizens become more educated and the workforce becomes more capable, educated citizens are able to solve problems and innovate in ways not previously contemplated. "A good education is necessary to get potential innovators to the knowledge frontier in the first place. A high-quality education builds cognitive and non-cognitive skills, which increase the productivity of future innovators."[28] Innovation itself is multifaceted; even in the most competitive of landscapes, innovation can be frustrated by a lack of educated employees, managers, and entrepreneurs.

42. Globalization and access to previously untapped markets also provides an avenue for innovation and change. As the world gets smaller and foreign markets become more

[26] John Taladay, Measuring the Impact of Injunctive Relief on Innovation, CPI Antitrust Chron (Apr. 2017), https://ssrn.com/abstract=4053918.

[27] Derek Eaton, Technology and Innovation for a Green Economy, 22 Rev. Eur. Compar. & Int'l Env't L. 62-67 (2013), available at https://doi.org/10.1111/reel.12020.

[28] Barbara Biasi, David J. Deming & Petra Moser, Education and Innovation (Nat'l Bureau of Econ. Rsch., Working Paper No. 28544, 2021), https://www.nber.org/papers/w28544.

reachable, innovation can become more profitable for both nascent and established companies. Globalized technology makes tapping into new markets easier. This premise is not unique to large established companies, but also applies to up and coming firms looking to gain a market advantage. Companies, whether in a competitive domestic landscape or not, may wish to innovate in order to tap into new markets, especially as those markets become more reachable.

## 5. Conclusion

43. In conclusion, competition is but one of many factors that drive innovation. Competition agencies are not responsible for innovation *per se*, and it is not the role of agencies to try to artificially create innovative marketplaces. However, as previously stated, BIAC is of the view that antitrust policy should contemplate innovation and be ready to accommodate novel business models and incentivise innovation. For their part, policy makers should ensure that other drivers of innovation are fostered and focused on as much as enhancing competition in certain markets. Each market is different, and the permutations and these factors must be carefully tailored to suit the market's growth objectives.