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How Do Vertical Mergers Affect Innovation? Learning from *Illumina*

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Introduction

Illumina is significant because it illustrates emerging Antitrust law and policy toward vertical mergers. The Federal Trade Commission (FTC) sought to block *Illumina*'s proposed acquisition of Grail.¹ Chief Administrative Law Judge D. Michael Chappell issued an Initial Decision that dismissed the FTC Complaint against the vertical merger.² The FTC Complaint in *Illumina* indicates how Antitrust policy may challenge vertical mergers on the basis of expected effects on innovation.³ The Initial Decision in *Illumina* shows that there are potential problems associated with implementing the FTC's changing Antitrust policies toward vertical mergers. I argue that the approach taken by the FTC's Complaint should not guide Antitrust policy toward vertical mergers.

¹ In the Matter of *Illumina, Inc.*, and *Grail, Inc.* (hereafter *Illumina*), October 14, 2022, FTC Matter/File Number 201 0144, Docket Number 9401, <https://www.ftc.gov/legal-library/browse/cases-proceedings/201-0144-illumina-inc-grail-inc-matter>.

² United States of America, Federal Trade Commission, Office of Administrative Law Judges, Docket No. 9401, In the Matter of *Illumina, Inc.*, a corporation, and *Grail, Inc.*, a corporation, Initial Decision, D. Michael Chappell Chief Administrative Law Judge. September 9, 2022, (hereafter Initial Decision), https://www.ftc.gov/system/files/ftc_gov/pdf/D09401InitialDecisionPublic.pdf. See also Administrative Law Judge Dismisses FTC's Challenge of *Illumina*'s Proposed Acquisition of Cancer Detection Test Maker Grail, September 12, 2022, <https://www.ftc.gov/news-events/news/press-releases/2022/09/administrative-law-judge-dismisses-ftcs-challenge-illuminas-proposed-acquisition-cancer-detection>.

³ United States of America Before the Federal Trade Commission Public Commissioners: Rebecca Kelly Slaughter, Acting Chairwoman, Noah Joshua Phillips, Rohit Chopra, Christine S. Wilson, In The Matter of *Illumina, Inc.*, A Corporation and *Grail, Inc.*, A Corporation. Docket No. 9401 Redacted-Public Version, https://www.ftc.gov/system/files/documents/cases/redacted_administrative_part_3_complaint_redacted.pdf.

The FTC’s Four-Step Process

The FTC Complaint in *Illumina* implicitly outlines a four-step process whereby a vertical merger would decrease competition. First, the FTC Complaint in *Illumina* considers a new technology as essential to the development of innovations, arguing that the upstream firm “*Illumina’s NGS [next-generation sequencing] platforms are an essential input for the development and commercialization of MCED tests.*”⁴ Second, the FTC Complaint in *Illumina* asserts that the vertical merger would create incentives for foreclosure, alleging that “[t]he Acquisition would create an incentive for Illumina to maximize its profits by foreclosing or disadvantaging Grail’s rivals because it would benefit significantly in the U.S. MCED market when rivals lose sales or alter their behavior in response.”⁵ Third, the FTC Complaint in *Illumina* asserts that the vertical merger would reduce innovation, observing that the downstream firm “*Grail, with its Galleri MCED test, is racing against several other firms to develop and ultimately commercialize this revolutionary technology.*”⁶ Fourth, the FTC Complaint in *Illumina* maintains that the vertical merger would decrease competition by reducing innovation: “*the Acquisition would substantially lessen competition in the U.S. multi-cancer early detection (“MCED”) test market by diminishing innovation and potentially increasing prices and reducing the choice and quality of MCED tests. In other words, it is likely to harm U.S. consumers.*”⁷

Taking the first step in the FTC’s process depends on showing that inventions are essential inputs and that there is a need for Antitrust policy to assure access. This step attempts to revive the problematic essential facilities doctrine and extend that doctrine to inventions that are input to innovation. The Supreme Court in *Trinko* offered various critiques of the Antitrust essential facilities doctrine.⁸ The courts have limited ability to implement access to traditional essential facilities. It is evident that the courts would have even less ability to implement access to new technologies.⁹ Characterizing physical facilities as essential is difficult enough, but identifying ideas, inventions, and technologies as essential raises additional concerns. There may be a scarcity of bridges across a river, but the creativity of competitors can generate multiple new technologies.

Second, the FTC Complaint in *Illumina* suggests that a vertically integrated firm would choose to withhold the new technology from competitors rather than

⁴ Complaint, id. at 3.

⁵ Complaint, id. at 23.

⁶ Complaint, id. at 3.

⁷ Complaint, id. at 2.

⁸ *Verizon Communications Inc. v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398 (2004).

⁹ Daniel F. Spulber and Christopher S. Yoo, Mandating Access to Telecom and the Internet: The Hidden Side of *Trinko*, *Columbia Law Review*, 107, December, No. 8, 2007, pp. 1822-1907.

licensing inventions. Implementing the second step depends on proving that a vertically integrated firm with valuable Intellectual Property (IP) would withhold new technologies from competitors of the merged firm. This requires demonstrating that the vertically integrated firm would have the incentive to foreclose downstream competitors, even though the upstream innovator provided the technology before the merger. The vertically integrated innovator would lose revenues it would obtain from licensing its technology to downstream competitors and might face retribution from competitors. The vertically integrated innovator would lose technology sales to successful downstream innovators. The second step also requires showing that the vertically integrated firm would be able to deny access to its technology to downstream competitors.

Third, the FTC Complaint in *Illumina* anticipates that withholding the new technology from competitors would diminish innovation. This step requires showing that a merged firm with in-house research and development (R&D) would decrease its inventive efforts after the merger. This step also would require showing that competitors of the upstream firm would decrease their R&D efforts after the vertical merger. In addition, this step would require showing that the merged firm and other downstream firms in the industry would end their “race” to develop innovative products. If the merged firm continued to license to competitors, its incentives for invention and innovation would continue undiminished after the merger. Competing upstream inventors or downstream innovators would have the incentive to develop technologies that replace and improve on that of the vertically integrated firm. This would result in greater innovative efforts overall.

Fourth, the FTC views the vertical merger’s potential reduction of innovation as decreasing competition and thus harming consumers. This fourth step requires demonstrating the vertical merger would diminish the intensity of competition. If the vertical merger improved the efficiency and speed of the merged firm’s innovative efforts, competition would increase. Vertical mergers need not increase horizontal concentration. *Illumina* would not remove competitors in either upstream or downstream markets. When vertical mergers create cost efficiencies, downstream innovation will increase and the costs of distributing innovative products will decrease. This will increase competition in downstream product markets.

Problems with the FTC’s Approach

Given these challenges faced by Antitrust policymakers, it should not be surprising that Judge Chappell’s Initial Decision concluded that the FTC did not make a convincing case. Judge Chappell found that the FTC failed to prove “*that Illumina’s post-acquisition ability and incentive to foreclose or disadvantage Grail’s alleged rivals is likely to result in a substantial lessening of competition in the relevant*

*market for the research, development, and commercialization of MCED tests.”*¹⁰ The Initial Decision points out that if the merged firm raised prices or otherwise foreclosed competitors, competitors would have “counterincentives” to decrease their demand for the technology, which would harm the merged firm.¹¹

It is far from evident that the vertically integrated firm would decrease its in-house R&D. The vertically integrated firm might achieve synergies in combining upstream invention with downstream innovation, better tailoring inventions to the needs of downstream firms. The vertically integrated firm also might realize economies of scale by combining the R&D activities, thus increasing incentives for innovation. This brings to mind Schumpeter’s hypothesis that incentives to innovate can benefit from market concentration and economies of scale in R&D. Illumina argues that the merger will improve its innovation because it “*can make GRAIL’s life-saving multi-cancer early detection test more available, more affordable, and more accessible - saving lives and lowering healthcare costs. As we continue to believe, this merger is pro-competitive and will accelerate innovation*”.¹²

It is unlikely that upstream competitors would decrease their inventive efforts or that downstream competitors would reduce their efforts to create innovative products. If upstream competitors anticipated that the vertical merger would seek to foreclose downstream firms or would raise prices to downstream firms, they would have greater incentives to invest in R&D. Downstream competitors would not have diminished incentives to develop innovative products. Downstream competitors would benefit from improvements in technology offered by either the vertically merged firm or competitive upstream inventors.

Market developments cast doubt on each of the four steps in the FTC Complaint. These developments show that (1) Illumina’s technology is not essential, (2) the vertical merger would not foreclose competitors from the marketplace, (3) the vertical merger would not decrease innovation, and (4) the vertical merger would not

¹⁰ Initial Decision, at 2.

¹¹ “A potential result of an attempt by Illumina to raise prices or otherwise foreclose or harm its MCED test developer customers is that these customers, as well as the non-MCED clinical testing customers who learned of any such attempt, would choose to no longer invest in current or future NGS applications on Illumina systems. F. 808. This could result in the loss of Illumina’s NGS sales for both MCED and non-MCED applications and would be contrary to Illumina’s stated strategy with the Acquisition to continue serving the NGS segment. F. 807. Complaint Counsel’s evidence does not sufficiently account for these counterincentives of Illumina, but merely assumes that, because Illumina recognizes that sequencing revenue will decline in the long term, and because Illumina seeks to shift toward more profitable clinical testing services, Illumina is motivated to harm its existing and future NGS customers in order to advantage Grail.” Initial Decision, at 174.

¹² Illumina Intends to Appeal European Commission’s Decision in GRAIL Deal, Press Release, September 6, 2022, <https://www.illumina.com/company/news-center/press-releases/press-release-details.html?newsid=1ef95365-0ca9-4726-a683-37124b1116b5#:~:text=%22Illumina%20can%20make%20GRAIL’s%20life,competitive%20and%20will%20accelerate%20innovation.>

diminish competition either among inventors or among innovators. According to a report, “[t]here have been enough next-generation sequencing (NGS) launches this year—both products and companies—to make even genomics’ aficionados heads spin”.¹³ Pacific Biosciences (PacBio) announced the launch of Revio, a “long-read” DNA sequencing platform that would be lower priced and higher throughput than competitors.¹⁴ PacBio also announced the testing of Onso, a “short-read” DNA sequencing platform.¹⁵ According to a Reuters report, “Onso is expected to be available for ordering and shipping in the first half of 2023, when it would compete with short-read systems sold by sequencing giant Illumina Inc.”¹⁶

Antitrust Policy and Innovation Competition

As I emphasize elsewhere, Antitrust policy recognizes the increasing importance of innovation competition.¹⁷ Considering innovation as a form of competition is displacing the traditional policy focus on market structure and short-term price competition. Competition requires innovation in products, production processes, transaction methods, and business strategies. The market value of corporations is driven primarily by intangible assets such as IP rather than plant and equipment. Advances in information and communications technology (ICT), the Internet of Things (IoT), Artificial Intelligence (AI), and other technologies have changed the nature of competition.

The increasing emphasis on innovation in Antitrust has affected merger policy. Antitrust policymakers in both the US and the European Union (EU) have considered innovation in merger reviews.¹⁸ The EU “innovation theory of harm” focuses on horizontal mergers and considers whether combining R&D projects would reduce innovation.¹⁹

¹³ Julianna LeMieux, PacBio Hopes to Maroon the Competition by Unveiling Two New Instruments at ASHG, Genetic Engineering and Biotechnology News, October 25, 2022, <https://www.genengnews.com/topics/omics/sequencing/next-generation-sequencing/pacbio-hopes-to-maroon-the-competition-by-unveiling-two-new-instruments-at-ashg/>.

¹⁴ Deena Beasley, PacBio to launch new gene-sequencing systems, Reuters, October 25, 2022, <https://www.reuters.com/business/healthcare-pharmaceuticals/pacbio-launch-new-gene-sequencing-systems-2022-10-26/>.

¹⁵ Pacific BioSciences, PacBio Announces Onso, the Highly Accurate Short-Read Sequencing Platform, News Release, October 25, 2022, Menlo Park, CA, https://www.pacb.com/press_releases/pacbio-announces-onso-the-highly-accurate-short-read-sequencing-platform/.

¹⁶ Reuters, id. 2022.

¹⁷ Daniel F. Spulber, Antitrust and Innovation Competition, 2022, *Journal of Antitrust Enforcement*, Vol. 10, <https://academic.oup.com/antitrust/advance-article/doi/10.1093/jaenfo/jnac013/6593929>.

¹⁸ Petit, Nicolas, 2019, Innovation Competition, Unilateral Effects, and Merger Policy, *Antitrust Law Journal*, 82-3, pp. 873-919.

¹⁹ Todino, Mario, Geoffroy van de Walle, and Lucia Stoican. EU Merger Control and Harm to Innovation—A Long Walk to Freedom (from the Chains of Causation). *The Antitrust Bulletin* 64, no. 1, 2019, pp. 11-30.

There are many motivations for vertical mergers. Vertical mergers may improve the effectiveness of both invention and innovation by allowing greater coordination. Antitrust policy should consider competition among inventors when evaluating vertical mergers.²⁰ I suggest elsewhere that firms may have incentives to vertically integrate R&D and production to increase appropriability when IP protections are not sufficiently strong.²¹ Antitrust policy should favor strengthening IP protections, which support competition in the market for inventions and thus increases incentives to invent and innovate. This implies that Antitrust policy and IP protections are complementary.²²

Economists have focused attention on how horizontal mergers affect innovation.²³ There is extensive literature that considers the effects of horizontal market structure on innovation with mixed empirical results.²⁴ The empirical literature has not provided much guidance on whether there is a relationship between R&D and market concentration.²⁵ This suggests caution in Antitrust policy that forecasts the effects of market concentration on innovation.

Antitrust Policy Toward Vertical Mergers and Innovation

Interactions between innovation and vertical mergers have important implications for public policy. The FTC began a re-evaluation of Antitrust policy toward vertical mergers including consideration of how vertical mergers affect innovation. The FTC withdrew the Vertical Merger Guidelines (VMGs) of 2020.²⁶ According to an FTC statement, innovation was a consideration: “*The VMGs correctly acknowledge that non-price elements of competition such as product quality and innovation must be considered, but did not provide a framework for how*

²⁰ Daniel F. Spulber, Competing Inventors and the Incentive to Invent, 2013, Industrial and Corporate Change, Volume 22 (1), February, pp. 33-72, doi: 10.1093/icc/dts013.

²¹ Daniel F. Spulber, How Do Competitive Pressures Affect Incentives to Innovate when there is a Market for Inventions?, 2013, Journal of Political Economy, 121, 6, December, pp. 1007-1054.

²² Spulber, Journal of Political Economy, id.

²³ See Federico, Giulio, Gregor Langus, and Tommaso Valletti, 2018. Horizontal Mergers and Product Innovation, International Journal of Industrial Organization 59, pp. 1-23; Federico, Giulio, Gregor Langus, and Tommaso Valletti, 2017. A Simple Model of Mergers and Innovation; Economics Letters, 157, pp. 136-140; Denicolò, Vincenzo, and Michele Polo, 2018, Duplicative Research, Mergers and Innovation. Economics Letters 166, 56-59; Denicolò, Vincenzo, and Michele Polo, 2018, The Innovation Theory of Harm: An Appraisal. Antitrust Law Journal, 82, 921.

²⁴ Wesley M. Cohen, 2010, Fifty Years of Empirical Studies of Innovative Activity and Performance, in Handbook of the Economics of Innovation, Bronwyn H. Hall and Nathan Rosenberg, eds., Volume 1, Chapter 4, pp. 129-213, <http://www.sciencedirect.com/science/handbooks/22108807/1>

²⁵ John Sutton: 1996. Schumpeter Lecture: Technology and Market Structure. European Economic Review, 40, pp. 511-530.

²⁶ Federal Trade Commission Withdraws Vertical Merger Guidelines and Commentary, September 15, 2021, <https://www.ftc.gov/news-events/news/press-releases/2021/09/federal-trade-commission-withdraws-vertical-merger-guidelines-commentary>; The 2020 Vertical Merger Guidelines are here: https://www.ftc.gov/system/files/documents/public_statements/1580003/vertical_merger_guidelines_6-30-20.pdf.

*these non-price factors would be assessed, instead highlighting quantitative models of price effects.*²⁷ This implies that the FTC intends to change Antitrust policy toward vertical mergers by increasing emphasis on potential innovation.

Antitrust policy that evaluates vertical mergers based on their effects on innovation breaks new ground. Yet, there does not appear to be empirical evidence that vertical mergers diminish innovation and harm competition. There has been little if any empirical analysis suggesting that vertical mergers decrease innovation. There is a need for more economic research on how vertical integration affects innovation. This suggests that Antitrust policymakers should exercise forbearance in addressing vertical mergers based on unfounded predictions of harm to innovation.

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The author is grateful for research support from Qualcomm and the Kellogg School of Management.

Citation: Daniel F. Spulber, *How Do Vertical Mergers Affect Innovation? Learning from Illumina*, Network Law Review, Fall 2022..

²⁷ Statement of Chair Lina M. Khan, Commissioner Rohit Chopra, and Commissioner Rebecca Kelly Slaughter on the Withdrawal of the Vertical Merger Guidelines Commission File No. P810034 September 15, 2021, https://www.ftc.gov/system/files/documents/public_statements/1596396/statement_of_chair_lina_m_khan_commissioner_rohit_chopra_and_commissioner_rebecca_kelly_slaughter_on.pdf.