

Innovation competition assessment by competition authorities

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Competition authorities may look beyond price when assessing the competitive effects of mergers and acquisitions (M&A); innovation is another important dimension of competition. Although the analytical tools used by competition authorities to predict the effect of a merger on price are familiar to practitioners, the methods used to assess the effect of a merger on innovation may not be. This article describes some of the methods used by competition authorities to identify how mergers may affect innovation. These include analysis of research and development (R&D) capabilities, internal documents, and statements of key opinion leaders.

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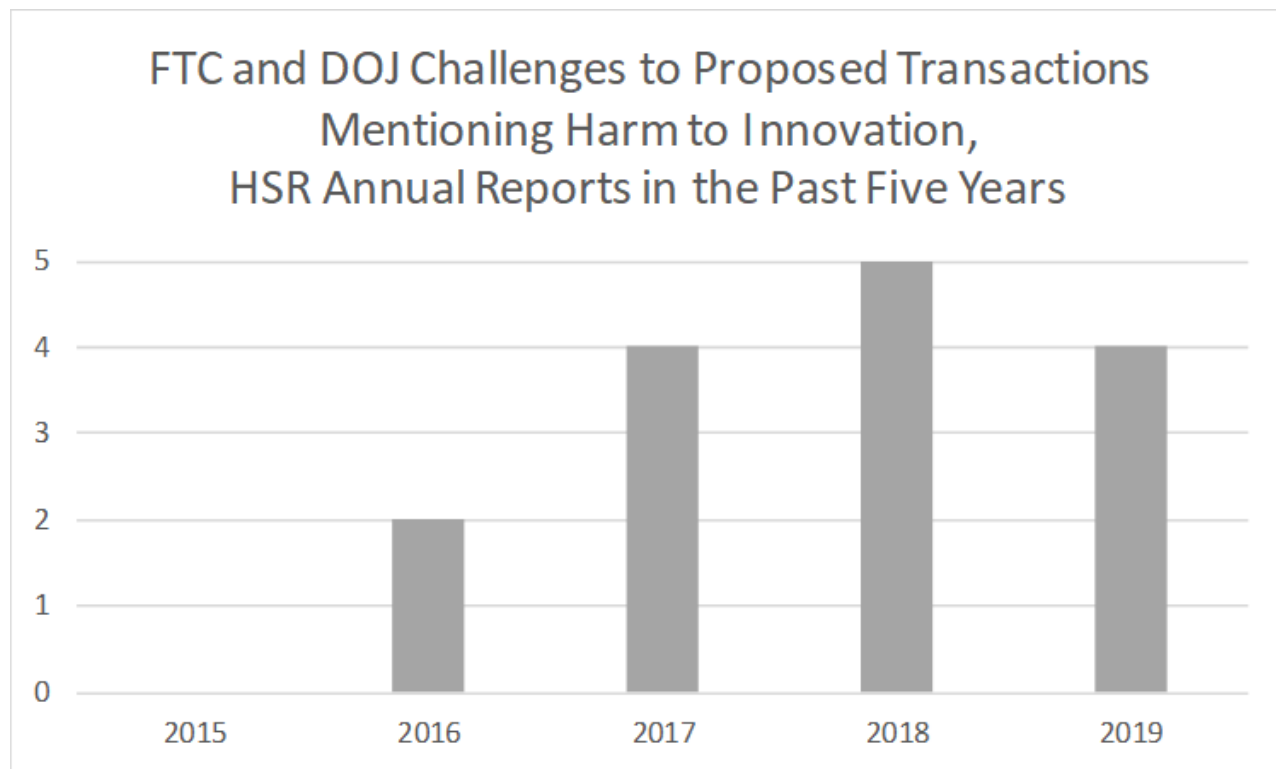
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Introduction

One of the first principles that students of economics learn is that competition between firms often leads to lower prices and higher output. This virtue of competition is the motivation for much of the contemporary antitrust analysis of mergers. Antitrust enforcers have well-known tools to predict or measure post-merger changes in prices and output. Mergers that are expected to lead to an increase in price and/or a reduction in output may be challenged as anti-competitive.

Recent conversations in merger enforcement have raised questions about the perceived focus of merger enforcement on short-run price effects over other dimensions of competition, like innovation. In recent years, competition authorities have increasingly raised concerns about harm to innovation. And though the most prominent examples of these concerns appear in recent decisions by the European Commission (EC), antitrust enforcement agencies in the US also have increasingly cited concerns about harm to innovation in merger enforcement decisions:



Source: *Hart-Scott-Rodino Annual Reports for fiscal years 2015-2019*.

Mergers may influence firms' incentives to innovate and the effects of changes in market structure post-merger. The impact of innovation on future competition and welfare may even offset concerns over post-merger changes in prices (see pages 48-49 in Katz, Michael and Howard Shelanski, "Mergers and Innovation", *Antitrust Law Journal*, Vol 74, No 1, 2007, pages 1-85).

Given the increasing use of advanced technology in many industries and the prevalence of digital platforms, which provide some products and services without charging conventional "prices", it is no surprise that discussions about merger activity have increasingly turned to questions about innovation.

Although the analytical tools that competition authorities have used to assess the price effects of mergers are well known to antitrust practitioners, less has been written about the methods and data sources used to assess innovation competition. In this article, we discuss the tools that competition authorities use to investigate theories of harm relevant to innovation, such as analysis of firms' research and development (R&D) capabilities, patents, internal documents, and input from key opinion leaders. As we show below, competition authorities may use any or all of these tools: there is no one-size-fits-all approach.

The innovation theory of harm

When two firms merge, any competition that existed between them before the merger is eliminated. The potential effects of this elimination of competition are commonly referred to as the "unilateral effects" of the merger (see *US Department of Justice and Federal Trade Commission: Horizontal Merger Guidelines (19 August 2010)*). For example, consider a hypothetical merger between Firm A and Firm B, and assume that the competition that exists between the two firms provides a strong incentive for each of them to charge low prices, to capture some of the demand that would otherwise go to their rival. If firms A and B merge, they no longer have an incentive to charge

such a low price. An expected unilateral effect of the merger of A and B might be that they will increase the prices of the merged products.

Traditionally, the potential for post-merger price increases has been the focus of horizontal merger enforcement. The potential unilateral effects of a merger, however, are not limited to changes in prices, and a merger that is not likely to lead to an increase in prices may still have other unilateral effects. For example, a merger of two innovative firms may change unilateral incentives to invest in innovation. A firm may also invest in innovative activities to develop a new product that will capture some demand from a rival firm. If those two firms merge, they will have less incentive to develop that new product, as it would cannibalise some of their existing sales. In general, if part of Firm A's expected return from an investment in R&D comes at the expense of Firm B's profits, then the combined firm will have less post-merger incentive to make that investment. The reduced incentive to invest in innovation is a potential unilateral effect of the merger between A and B.

Of course, the potential effect of a merger on innovative activities need not be negative. For example, a merger of two firms may lead to the combination of complementary R&D assets. Particularly in the case of the acquisition of a small start-up by an established firm, a merger may help to scale up new technologies and bring them to market faster. Competition authorities consider whether such merger "synergies" outweigh the potential for anti-competitive harm, if any.

Methods to assess the effects of mergers on innovation

In this section, we discuss the tools and methods that competition authorities use to analyse innovation competition, and include some brief examples from recent cases around the world where these tools played a role.

When analysing the potential effects of a merger on innovation (as opposed to prices), competition authorities generally focus less on observable prices and market shares. This is because prices and sales of current products may not reliably reflect how substitutable the innovations in two firms' development pipelines may be.

To analyse the potential effects of a merger on innovation, competition authorities have analysed firms' R&D capabilities, patents and patent citations, internal documents, and testimony from key opinion leaders. These sources of information allow competition authorities to circumvent the challenge of assessing competition among products or product features not yet available in the market.

R&D capabilities

Overlap in R&D capabilities may indicate how likely firms are to compete in the future and therefore to what extent a merger or acquisition may remove competitive pressures to innovate. The EC merger guidelines specifically recommend analysis of R&D efforts between merging parties to assess the effects on innovation competition (see *paragraph 120, Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements (OJ 2011 C11/1)*). Competition authorities may use broad measures of R&D capabilities, such as the size of research budgets and share of research staff dedicated to a particular endeavour, to assess how closely merging or acquiring firms are likely to compete.

R&D capabilities played a role in a recent ruling from the UK's Competition and Markets Authority (CMA). In assessing the merger between two DNA sequencing firms, the CMA argued in 2019 that given the overlap in assets, including research personnel, the merger was likely to have anti-competitive effects and reduce incentives to innovate (see *Notice of possible remedies* in the anticipated acquisition by Illumina, Inc of Pacific Biosciences of

California, Inc). The merger was eventually abandoned in the face of provisional adverse findings by both the CMA and the US Federal Trade Commission (FTC).

Patents from the merging firms can also be used to assess whether they are likely to exert enough competitive pressure on each other to incentivise innovation in the future. At times, competition authorities may view a firm's share of the patents in a given area as a proxy for market power (see page 246 in *Kokkoris, Ioannis and Tommaso Valletti, "Innovation Considerations in Horizontal Merger Control", Journal of Competition Law & Economics, June 2020, pages 220-261*). Patents can be useful to identify competitive pressures when substitute products are still in various phases of R&D, and prices and market shares are not observable (see *Case M.7932 - Dow/DuPont, Commission Decision, 27 March 2017*).

More sophisticated measures, such as patent citation counts (rather than raw patent counts), are also used to assess competitive pressures between firms (see page 148 in *Giulio, Federico, Fiona Scott Morton, and Carl Shapiro, Antitrust and Innovation: Welcoming and Protecting Disruption in Innovation Policy and the Economy, ed Josh Lerner and Scott Stern, pages 125-190, University of Chicago Press, 2020*). Competition authorities may view relatively high patent citations as an indicator that a firm has greater market power (though the interpretation of citation counts and patent counts is often the subject of extensive dispute by technical and economic experts). For example, patents played a central role in the EC's assessment of the *Dow/DuPont* merger's effect on innovation. The EC used the firms' own patent tracking software to assess overlaps in R&D that indicated how closely the two firms competed. The EC approved the merger with divestments.

This broad overview belies the methodological considerations given to constructing proxies of market power and competitive pressure from patents. A longstanding academic literature has explored these considerations in detail. (For a discussion of these methodological considerations relevant to recent EU mergers cases, see *Buehler, Benno, Daniel Coublucq, Cyril Hariton, et al, "Recent Developments at DG Competition: 2016/2017", Review of Industrial Organization, Vol 51, 2017, pages 397-422*. A more general discussion of the use of patents in economics research can be found in *Griliches, Zvi, "Patent Statistics as Economic Indicators: A Survey", Journal of Economic Literature, Vol 28, 1990, pages 1661-1707*.)

One reason patents may not be a strong measure of market power in some industries is that patents and patent portfolios are licensed across firms as part of standard-setting procedures and fair, reasonable, and non-discriminatory (FRAND) agreements. These agreements may limit the ability of specific licensors or licensees to exploit the gains of the standard-setting process. Therefore, these methods for assessing patent portfolios must be considered carefully in the context of market structure and industry licensing practices.

Internal documents

As with analyses of post-merger pricing incentives, internal documents that contain explicit information about firms' innovative activities may also be used to assess how the merger or acquisition will affect incentives to innovate. These documents may discuss which rival firms and pipeline products pose the largest threat to the incumbent or acquiring firm's market position. Internal documents may also discuss explicit strategies to limit competition through merger or acquisition.

Internal documents have been used in several recent merger and acquisition cases, including *Dow/DuPont*. The EC used various documents to substantiate the conclusion that the firms aimed to reduce R&D and innovation targets after the merger (see page 914 in *Petit, Nicolas, "Innovation Competition, Unilateral Effects and Merger Policy", Antitrust Law Journal, Vol 82, 2019, pages 873-919*).

Such documents also played a key role in a retrospective review of an acquisition between two prosthetics manufacturers in the US. Internal documents revealed that the target firm had intended to delay updates to existing products, and the FTC argued in 2019 that the acquisition likely had led to anti-competitive effects through less innovation despite no demonstrable increase in price (see *page 35 of Opinion of Commissioner Rohit Chopra, Docket No 9378, Otto Bock HealthCare North America, Inc, 1 November 2019* (Opinion of Commissioner Chopra)). The acquisition was reversed by the FTC (*Opinion of Commissioner Chopra, page 4*). These cases reflect how tools used to assess innovation competition are not only used to understand future competition, but can also be used in retrospective investigation as well.

Key opinion leaders

Statements from key opinion leaders can also support assessments of a merger's effects on innovation. The use of key opinion leaders may help define the relevant market and identify whether pipeline products are likely competitors in the absence of historical data on prices and sales. Key opinion leaders draw on industry-specific expertise: for M&A in the pharmaceutical industry, for example, key opinion leaders are often selected from among established scientists or practitioners in the medical community. In such cases, the key opinion leaders can draw on their scientific knowledge to provide specific insight into the relative efficacy of medical interventions to complement broader economic frameworks of competition.

For the recent *Takeda/Shire* merger, the EC relied on testimony from key opinion leaders (leading figures in the medical community) to show that the rival firms' products (still in development) were likely to be close competitors once they became available, and therefore the merger might inhibit innovation competition. The key opinion leaders questioned whether the incumbent "would have the incentive to continue development, given the risk of cannibalising its own sales post-transaction" (*paragraph 88, Case M.8955 - Takeda/Shire, Commission Decision, 20 November 2018*). The EC approved the merger, conditional on divestment of research in specific pipelines where the two firms overlapped.

Discussion

Assessing the effects of M&A on innovation (not just price) is an important priority for competition authorities. Mergers that limit incentives to innovate may harm consumers if new products never reach the market, or if these products are priced supra-competitively when they do.

Competition authorities rely on a mix of methods and data sources to understand how M&A may affect firms' incentives to innovate. These sources and methods include internal documents, which can outline specific acquisition strategies, and statements from key opinion leaders and assessments of R&D endeavours and patents to assess the competitive pressure between products still in development. Competition authorities may apply any combination of these methods or sources in their assessment of innovation competition. In the *Dow/DuPont* merger, for example, the EC used both highly technical quantitative assessments of patents as well as internal documents about firms' strategies. Some of these tools are not specific to the analysis of innovation incentives: internal documents or key opinion leaders could be used to analyse potential price effects as well. But they are particularly relevant to the analysis of innovation competition, where quantitative analysis of historical data is not a feasible substitute.

The methods and sources we outline above allow competition authorities to identify firms' innovation incentives. The analysis adds another dimension to the evaluation of market competition, complementing the tools long used in assessments of unilateral effects on price. Although the approaches we have discussed do not yield a one-size-fits-all formula, they do allow for careful and, if correctly applied, impartial applications of economic theories to understand how mergers or acquisitions may positively or negatively affect innovation, if at all.

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