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## Merger effects on innovation: A rationale for stricter merger control?

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# DISCUSSION PAPER

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## Merger Effects on Innovation: A Rationale for Stricter Merger Control?

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# Merger Effects on Innovation: A Rationale for Stricter Merger Control?

Justus Haucap

September 2017

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## Abstract:

The question how mergers affect innovation has gained prominence in a number of recent merger cases. Accounting for the likely effects of mergers on innovation is difficult for a number of reasons though. First of all, the relationship between market concentration and innovation is far from clear and not unambiguous. While it is an empirical regularity and, hence, a useful presumption that an increase in market concentration also leads to an increase in price, the case for a similarly general presumption with respect to mergers and innovation is relatively weak. Secondly, while mergers may result in innovation efficiencies, these may be difficult to demonstrate, given that the European Commission requires the efficiencies to accrue in a timely fashion, i.e., within two to four years after the merger. This contrasts with the timespan applied to the theories of harm which the Commission itself employs. This structural asymmetry tends to bias the framework against innovation efficiencies. Thirdly, remedies are notoriously difficult to design, and this is even more valid for innovation markets. In addition, competitors may choose to strategically not disclose part of their research ideas and pipelines in order to sabotage a competing merger if that merger would be procompetitive. Hence, the market test for remedies, which is already difficult in other merger cases, given market participants' strategic interests, will be even more difficult for innovation markets where competing firms can easily hide their intentions, research ideas and pipelines.

## 1. Introduction: Innovation matters

Competition authorities in Europe and the US are becoming increasingly concerned about the effects that mergers can have on innovation. In a speech, titled “competition – the mother of invention”, the European Union's competition commissioner, Margrethe Vestager, claimed that “one of our basic jobs, as competition enforcers, is to make sure that companies don't abuse their power to hold back innovation.” Moreover, Vestager explained that “when we look at high-tech mergers, we do not just look at whether they might raise prices. We also assess whether they could be bad for innovation. Last year, we looked at a merger between the drug company Pfizer and its rival, Hospira. We only approved the deal after Pfizer agreed to sell the European rights to an arthritis drug it was developing. One concern was that Hospira already had a competing drug on the market, and we thought Pfizer might stop work on its own drug if the deal went ahead as planned. Which would have meant less of the innovation that we depend on as patients”.<sup>1</sup> Similarly, in the acquisition of GlaxoSmithKline's oncology business by Novartis the European Commission “identified the risk that Novartis would likely have stopped developing two innovative drugs that showed great promise for the treatment of skin and ovarian cancer”<sup>2</sup>. Another example is the Medtronic/Covidien merger which involved two medical device companies with Medtronic being the leader on the market for drug-coated balloons to treat vascular diseases. The target company Covidien had a promising late-stage pipeline product, a drug-coated balloon called Stellarex and the European Commission argued that Covidien would have constrained Medtronic in the near future, in view of the promising clinical trial results of Stellarex. According to the Commission the merger would have, without proper remedies, eliminated a credible competitor and likely have reduced innovation in this area. The merger was approved in 2014, but in order to address the Commission's concerns, Medtronic committed to selling Covidien's worldwide Stellarex business, including in particular manufacturing equipment, related IPRs and scientific and regulatory material necessary to complete the Stellarex trials, and key personnel. More recent merger cases in which reduced innovation incentives and capabilities have been a key concern of the Commission

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<sup>1</sup> See Vestager, M.: “Competition: The mother of invention”, speech delivered at the European Competition and Consumer Day, 18 April 2016, [https://ec.europa.eu/commission/2014-2019/vestager/announcements/competition-mother-invention\\_en](https://ec.europa.eu/commission/2014-2019/vestager/announcements/competition-mother-invention_en)

<sup>2</sup> European Commission. 2016. “EU merger control and innovation.” Competition Policy Brief 2016-01, p. 4.

include General Electric/Alstom (2015), Intel/McAfee (2011), Hutchison 3G/O2 UK (2016), Dow/Du Pont (2017) and the still ongoing Bayer/Monsanto case. In most of these cases, the European Commission has intervened and requested remedies with the explicitly stated goal of preserving innovation, while the proposed Hutchison 3G/O2 UK merger was even completely blocked. As Commissioner Vestager explained with respect to that case, “we had strong concerns that consumers would have had less choice finding a mobile package that suits their needs and paid more than without the deal. It would also have hampered innovation and the development of network infrastructure in the UK, which is a serious concern especially for fast moving markets“. Moreover, in recent cases such as recent Dow/Du Pont merger or the acquisition of GlaxoSmithKline's oncology business by Novartis, the Commission has even investigated overlaps of research at very early stages (phase I), the success of which is very difficult to predict.

Interestingly enough though, US competition authorities appear to be somewhat less concerned about potential adverse effects that mergers may have on innovation. Taking the Pfizer/Hospira merger as an example, the Federal Trade Commission (FTC) did not request similar remedies as the European Commission. As Comanor and Scherer have recently argued, the negative effects of mergers on innovations may be underestimated by the FTC.<sup>3</sup> In fact, Comanor and Scherer claim that "instead of enhancing R&D productivity, the merger wave has jeopardized it."<sup>4</sup> However, the authors also note that their "conclusions are suggestive rather than definitive".<sup>5</sup>

As it is clear that innovation is key to economic growth and prosperity, safeguarding innovation incentives should indeed play a major role in competition policy. Unfortunately though, the relationship between competition and innovation is far from clear. While there is a large body of (mostly empirical) research on the relationship between market structure and innovation, the results are by no means unambiguous. In addition, the effects of concrete mergers on innovation are even less well understood. As a result, the analysis of merger cases has, with a few exceptions,

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<sup>3</sup> Comanor, William S and Frederic M Scherer. 2013. “Mergers and innovation in the pharmaceutical industry”, *Journal of Health Economics* 32 (1), p. 107.

<sup>4</sup> Comanor, William S and Frederic M Scherer. 2013. “Mergers and innovation in the pharmaceutical industry”, *Journal of Health Economics* 32 (1), p. 106.

<sup>5</sup> Comanor, William S and Frederic M Scherer. 2013. “Mergers and innovation in the pharmaceutical industry”, *Journal of Health Economics* 32 (1), p. 113.

until recently mostly focused on price effects (and quantities), but often neglected effects on innovation incentives, a point of critique that has also been raised by Comanor and Scherer<sup>6</sup> and Gilbert and Greene<sup>7</sup> recently. However, as has already been pointed out above, this has changed in recent times, as a number of high profile mergers have been scrutinised especially with respect to their potential effects on innovation.

## **2. The Legal Framework**

While the stricter focus on innovation incentives is a more recent phenomenon, the European Commission's merger guidelines have, in principle, long provided for an analysis of innovation effects. According to §8 of the European Commission's Horizontal Merger Guidelines (HMG) one of the effects to be analysed in merger control is "the effect on innovation", putting the competitive harm caused by a reduction of innovation on an equal footing with price increases, or a reduction of output, choice or quality of goods and services. While §38 HMG also notes that "a merger may increase the firms' ability and incentive to bring new innovations to the market and, thereby, the competitive pressure on rivals to innovate in that market", it also notes that "effective competition may be significantly impeded by a merger between two important innovators, for instance between two companies with 'pipeline' products related to a specific product market." The Commission's Non-Horizontal Merger Guidelines (NHMG) offer a similar framework for assessing innovation effects in §10 and §26 NHMG.

Similarly, section 6.4 of the US Horizontal Merger Guidelines, specifies that "competition often spurs firms to innovate" and that US competition authorities "may consider whether a merger is likely to diminish innovation competition by encouraging the merged firm to curtail its innovative efforts below the level that would prevail in the absence of the merger." It is noteworthy though that effects on competitors' innovation incentives or the concerned industry's competition and innovation dynamics are not mentioned in the US merger guidelines.

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<sup>6</sup> Comanor, William S and Frederic M Scherer. 2013. "Mergers and innovation in the pharmaceutical industry", *Journal of Health Economics* 32 (1): 106-113.

<sup>7</sup> Gilbert, Richard and Hillary Greene. 2015. "Merging innovation into antitrust agency enforcement of the Clayton Act", *George Washington Law Review* 83 (6): 1919-1947.

### 3. Economic Theory of Merger Effects on Innovation

One key difference in the analysis of a merger's static effects on both prices and quantities and the merger's effects on innovation is the lack of reliable pattern predictions with respect to innovation. As a rule of thumb and a useful heuristic, a reduction in the number of firms in any given market (and, thereby, an increase in concentration levels) tends to lead to an increase in prices and a reduction in consumer and overall welfare. Of course, there are exceptions from the rule which can, at least in theory, be demonstrated as part of an efficiency defence.

In stark contrast, the relationship between concentration levels and innovation is far less clear and much more ambiguous. Effectively, innovation incentives may, generally speaking, either increase or decrease with an increase in market concentration.

The reason for the ambiguous relationship between market concentration and innovation are the various countervailing effects at work. First of all, as has been pointed out more than 50 years ago by Arrow<sup>8</sup>, the replacement effect (sometimes also called profit effect) implies that firms with high market shares (in concentrated markets) have lower incentives to invent new products as these products replace the firm's own products to a large extent. Put differently, if firms enjoy already high profit levels due to high market concentration rates the additional profit from innovative products is relatively small, at least when compared to firms with low profit levels of low market shares (in less concentrated markets), as the latter have more to gain from innovation. However, as has been shown, the replacement effect does not need to hold once products are sufficiently differentiated.<sup>9</sup>

More fundamentally though, the effect may be completely reversed once the relevant counterfactual is changed. While Arrow has compared a firm's profits with and without a given innovation to derive the firm's innovation incentives, Gilbert and Newberry<sup>10</sup> have argued that the relevant counterfactual may rather be the

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<sup>8</sup> Arrow, Kenneth. 1962. "Economic welfare and the allocation of resources for invention", in :The Rate and Direction of Inventive Activity: Economic and Social Factors. Princeton University Press, 609-626.

<sup>9</sup> See, e.g., Greenstein, Shane and Garey Ramey. 1998. "Market structure, innovation and vertical product differentiation", International Journal of Industrial Organization 16 (3):285-311, and Gilbert, Richard. 2006. "Looking for Mr. Schumpeter: Where are we in the competition-innovation debate?", in: Innovation Policy and the Economy, Volume 6. The MIT Press, 159-215.

<sup>10</sup> Gilbert, Richard J and David MG Newbery. 1982. "Preemptive patenting and the persistence of monopoly." American Economic Review 72 (3): 514-526.



competitive threat of a competitor adopting the innovation. Hence, the relevant comparison to derive a firm's innovation incentives would be the firm's profit with innovation compared to the firm's profit when a competitor first adopts the innovation. This comparison appears to be especially relevant for patentable innovations. As firms with high market shares and high profit levels (in concentrated markets) have more to lose, their innovation incentives are higher for them than for firms in less concentrated markets which enjoy lower profit levels. Similarly, Schmutzler has recently argued that "competition reduces margins, and increases the sensitivity of equilibrium output with respect to efficiency. Adding to these ambiguities, competition can have positive or negative effects on equilibrium output and on the sensitivity of prices with respect to marginal costs. Together, this explains why the effects of competition on investment are ambiguous."<sup>11</sup> The same logic basically applies to R&D expenditures. Hence, the effects of market concentration and competition on R&D and innovation are unclear and heavily depend on the counterfactual chosen.

In addition, a number of further effects complicate the relationship between market concentration and competition even further. The cost saving effect suggests that larger firms with high market shares can spread their R&D expenses over larger quantities or more product lines which should increase the firm's incentives to conduct R&D. Hence, if we only look at the cost saving effect a merger should lead to an increase in R&D. However, as mergers also tend to lead to overall quantity reductions in the market, according to most economic models (due to the weakening of competition), this again reduces overall R&D incentives. In addition, merging firms have an incentive to shut down parallel research lines to avoid unnecessary duplications of cost. Hence, mergers can reduce the merged firm's R&D expenses which in turn may also lead to competitors reducing their R&D efforts, as Haucap and Stiebale have actually shown in an empirical analysis of 65 European merger cases in the pharmaceutical industry.<sup>12</sup> However, synergies, complementary knowledge and technologies may increase R&D incentives again. This is especially true for

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<sup>11</sup> Schmutzler, Armin. 2013. "Competition and investment A unified approach", *International Journal of Industrial Organization* 31 (5):477-487.

<sup>12</sup> See Haucap, Justus and Joel Stiebale. 2016. "How mergers affect innovation: Theory and evidence from the pharmaceutical industry", DICE Discussion Paper, online available at: <https://ideas.repec.org/p/zbw/dicedp/218.html>. A short summary of the paper can be found at: <https://hbr.org/2016/08/research-innovation-suffers-when-drug-companies-merge>

complementary technologies and should be of relevance of vertical and conglomerate mergers.

According to Shapiro<sup>13</sup>, three principles are of particular relevance to understand the relationship between competition and innovation: Firstly, markets need to remain contestable for innovation to flourish. Secondly, the extent to which firms can capture the value created by their innovation (appropriability) increases innovation incentives, and, thirdly, synergies, arising for instance from the combination of complementary assets, can enhance the ability to innovate.

Overall, and in stark contrast to price effects of mergers, the case for a general presumption that an increase in concentration leads to (unilateral) reductions in R&D expenditures and innovation incentives is not warranted. In addition, to complicate matters even more, the welfare effects are also less clear. At least in theory, there may even be too much R&D from a social welfare perspective if firms engage in patent races. Hence, a reduction in R&D could even be welfare enhancing, even though this theoretical concern appears to be of little practical relevance. As state aid rules, patents and the use of other policy instruments to foster innovation suggest, policy makers rather tend to be concerned about a lack of innovation rather than having too much of it. Nevertheless, it should be noted that while there is a rather unambiguous relationship between market concentration and price levels, the relationship between market concentration and innovation is far more complex and not unambiguous. Hence, a general presumption that mergers tend to reduce innovation efforts is clearly not warranted. Having said this, however, both economic theory and empirical evidence suggests that 3-to-2 mergers tend to be more problematic than 5-to-4 mergers, not only in terms of price effects, but also due to their potentially adverse effects on innovation, at least in research intensive industries. In fact, with respect to 5-to-4 mergers there is no reliable general presumption on a merger's innovation effects. What makes a merger's impact on innovation even more difficult to evaluate is the fact that mergers typically concern multi-product firms which may often imply a 5-to-4 merger in one product market (where innovation effects may, therefore, be positive) and a 3-to-2 merger in another product market (where innovation effects may be negative). Hence, the overall

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<sup>13</sup> Shapiro, Carl. 2012. "Competition and Innovation: Did Arrow Hit the Bull's Eye?", in: Josh Lerner and Scott Stern (eds.), *The Rate and Direction of Inventive Activity Revisited*, University of Chicago Press, p. 361-404.

balance of a merger's effects on innovation across all product markets involved may be mixed and difficult to evaluate.

#### **4. Innovation Theories of Harm**

Of course, any particular merger *can* reduce innovation efforts to the detriment of society, even though the general relationship between market concentration and innovation is by no means clear. By and large, there are three innovation theories of harm that have been applied in the past.

1. Firstly, the merging parties may – without the merger – exert a significant constraint on each other in a future market, and this constraint is removed when the two parties merge.
2. Secondly, competition may be reduced when one of the products of the merging parties may not be developed as a result of the merger.
3. And thirdly, non-horizontal mergers may involve foreclosure scenarios that hinder innovation by third parties, e.g., when a competitor would likely lose access to a product of the merged entity that is needed for it to innovate (e.g., standard essential patents).

While these anticompetitive effects may well be realistic risks in particular cases, mergers may also bring efficiency gains related to innovation, as discussed below.

#### **5. Innovation Efforts as Part of an Efficiency Defence**

According to a 2012 OECD Roundtable report<sup>14</sup> some typical efficiency claims are related to R&D efficiencies. Mergers can raise synergies in labs, bring together complementary research lines and skills, and also avoid the duplication of research.

More recent evidence, gathered by Reinhilde Veugelers<sup>15</sup>, however, suggests that innovation efficiencies only play a minor role in European merger control. According to Veugelers, from a total of 42 EU phase II merger cases between 2004 and 2016 efficiencies were claimed in only 16 cases, of which only 11 claimed dynamic

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<sup>14</sup> OECD. 2012. The Role of Efficiency Claims in Antitrust Proceedings. OECD Policy Roundtables. OECD.

<sup>15</sup> See Veugelers, Reinhilde. 2017. Competition Policy and Innovation, Update to Veugelers, Reinhilde. 2012. "Innovation in EU merger control: Walking the talk", Bruegel Policy Contribution 2012/708, presented at the Competition and Innovation Summer School (CISS) 2017.

efficiencies claims. In only four cases, innovation was mentioned in the efficiency claims. While in three of these four cases the Commission accepted that the innovation would bring consumer benefits in a timely fashion, only two of the claimed efficiency gains were accepted to be merger specific and in only one single case also to be verifiable so that the dynamic efficiency claim was finally accepted. In that particular case (Hutchison 3G & Telefonica Ireland), the dynamic efficiency claims were not decisive though for the merger decision.

Why are dynamic efficiencies related to innovation not claimed more often? As has been argued by Röller<sup>16</sup>, one reason may be that claiming efficiencies may lead to a negative presumption within the Commission about the particular merger's anti-competitive effect. An additional reason, particularly related to innovation efficiencies, may well be that the requirement that efficiencies must benefit consumers in a timely fashion is very difficult to fulfil. According to the Commission, timeliness is interpreted as a two to four year timeframe. Interestingly enough, while the claimed efficiencies are expected to materialise in the near future in order to be accepted, the expected harm can also occur in the distant future. As a consequence, a structural imbalance results, where efficiencies have to materialise quickly after the merger, while potential detriments to competition and innovation can occur in the distant future.

To illustrate this concern: When *Novartis* acquired *GlaxoSmithKline's (GSK) oncology business* the European Commission's concerns not only related to late-stage (phase III) pipelines, but also to earlier stage (phases I and II) pipelines in connection with the same drugs. To be more precise, the Commission was concerned that Novartis might have stopped developing two innovative drugs that showed great promise for the treatment of skin and ovarian cancer (for which late-stage clinical trials were being conducted) and that were also tested for treating several other cancer types (for which early-stage clinical trials were ongoing). As GSK already had drugs with the same mechanisms in its portfolio, the merger would have led to a duopoly between the merged entity and Roche for these specific skin and ovarian cancer treatments. Hence, the Commission argued that the merger would likely have reduced innovation in the area and that Novartis would likely abandon its early-stage clinical trial programme of the two drugs. Similarly, the European Commission has

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<sup>16</sup> Röller, Lars-Hendrik. 2010. "Efficiencies in EU Merger Control: Do They Matter?", in: Hans Jürgen Ramser and Manfred Stadler (eds.), *Marktmacht*, Mohr Siebeck, Tübingen, pp. 185-195.

argued in its most recent decision regarding the Dow/Du Pont merger that the transaction would be likely to impede competition for innovations, as the merged parties would have reduced incentives to conduct parallel research in cases of overlapping research agendas even for early pipeline products. As a consequence, the Commission imposed strict remedies specifically addressing its concerns with respect to innovation. The result is the structural asymmetry mentioned above: While the theory of harm is, at least partially, based on concerns that may possibly materialise in the distant future (as very early stage research is concerned which also actually often fails in the end), the efficiencies claimed must materialise within two to four years to be accepted. Hence, the asymmetric shift in the Commission's predictive timeframe tends to overemphasize potential efficiency losses while underemphasizing potential efficiency gains.

Finally, the condition of verifiability may prove to be even more problematic for demonstrating innovation efficiencies, given the inherently uncertain nature of R&D and innovation.

## **6. Remedies**

To address its innovation competition concerns the European Commission has used a number of remedies such as licensing requirements, structural measures such as the divestment of research labs (including key personnel), testing facilities and even entire production lines, access to technical information and IPRs. The effectiveness of these remedies is difficult to evaluate, however, as R&D is inherently uncertain.

Further remedies, especially in digital markets, may include interoperability requirements and access rights to data. The latter remedy, however, can require a balancing of competition and privacy concerns.

A particular problem may arise if competitors can engage in strategic non-disclosure of their own research, especially in early stages. If a competitor fears that a merger would be procompetitive or if the competitor wishes to acquire IPRs, labs or even personnel from a merging party, that competitor may strategically decide not to disclose its own research agenda in order to have the Commission imposing obligations on the merging parties. Such a non-disclosure strategy will be easier for early stage research than for later stage research and also easier than for sales or production

capacities. Hence, there is an increased risk that competitors successfully behave strategically with respect to innovation-related remedies in order to influence their design.

## **7. Conclusions**

The question how mergers affect innovation has gained prominence in a number of recent merger cases. Indeed, innovation effects of mergers should be carefully considered, even though accounting for the likely effects of mergers on innovation is difficult for a number of reasons. First of all, the relationship between market concentration and innovation is far from clear and not unambiguous. This is in stark contrast to static price and quantity effects of mergers: While it is an empirical regularity and, hence, a useful presumption that an increase in market concentration also leads to an increase in price, the case for a similarly general presumption with respect to mergers and innovation is relatively weak, as the relationship between mergers and innovation is ambiguous. An increase in market concentration can either increase or decrease innovation incentives, heavily depending on the particular circumstances. Nevertheless, most theoretical models and empirical studies show that if the market is already very concentrated, a further concentration is more likely to reduce innovation incentives than a merger in an only moderately concentrated market. Hence, 3-to-2 mergers can safely be treated with more suspicion than 5-to-4 mergers, also from an innovation perspective. The matter becomes more complicated, of course, once multiproduct firms are involved so that a merger may result in a 5-to-4 concentration in one market and a 3-to-2 concentration in another one.

Secondly, while mergers may result in innovation efficiencies, these may be difficult to demonstrate, given that the European Commission requires the efficiencies to accrue in a timely fashion, i.e., within two to four years after the merger. This contrasts with the timespan applied to the theories of harm which the Commission itself employs. The acquisition of GlaxoSmithKline's (GSK) oncology business by Novartis was only cleared under conditions that also addressed early stage research (phases I and II) pipelines. Similarly, in the recent Dow/Du Pont merger the European Commission focused on the parties' incentives to continue with their research in case of overlapping lines of research, including again very early stage research

pipelines. As these early stage research pipelines will – in the very uncertain case of the research being successful – often only lead to marketable products in five to ten years, the competitive harm may well occur in the distant future, while efficiencies must materialize soon in order to be accepted. This structural asymmetry tends to bias the framework against innovation efficiencies.

Thirdly, remedies are notoriously difficult to design, and this is even more valid for innovation markets. In addition, competitors may choose to strategically not disclose part of their research ideas and pipelines in order to sabotage a competing merger if that merger would be procompetitive. Hence, the market test for remedies, which is already difficult in other merger cases, given market participants' strategic interests, will be even more difficult for innovation markets where competing firms can easily hide their intentions, research ideas and pipelines.

Overall though, the case for considering innovation as part of merger decisions in R&D intensive industries, is warranted. As our own research has shown, merger may not only negatively affect the merging parties' innovation incentives, but also lead to a reduction in competitors' R&D efforts.<sup>17</sup> Nevertheless, one needs to be careful to draw general conclusions, beyond the finding that a 3-to-2 merger is more likely to be problematic than a 5-to-4 merger. Overall, a cautious case-by-case approach is warranted.

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<sup>17</sup> See Haucap, Justus and Joel Stiebale. 2016. (see above fn. 12)

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