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# Innovation in EU Merger Control: Theories of Harm and Efficiencies

Martin Peitz<sup>1</sup>

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<sup>1</sup> University of Manneheim and MaCCI; Email : martin.peitz@gmail.com

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# Innovation in EU Merger Control: Theories of Harm and Efficiencies<sup>1</sup>

*Martin Peitz*

University of Mannheim and MaCCI

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## **Abstract:**

Innovation and the diffusion of new technologies are central to consumer welfare in dynamic markets. On the one hand, mergers may harm innovation by removing independent innovation paths, restricting access to key inputs for innovation, or weakening incentives to adopt and diffuse new technologies. On the other hand, mergers may generate innovation efficiencies when they combine complementary tangible and intangible assets. This article discusses how the revised EU Merger Guidelines should evaluate these opposing forces and proposes a structured approach to assessing innovation harms and efficiencies while ensuring that merger control remains focused on effective competition and consumer welfare.

**Keywords:** EU merger control, innovation theories of harm, innovation efficiencies, start-up acquisitions, EU Merger Guidelines

**JEL-Classification:** K21, L40, L41

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## 1. Revising the merger guidelines

The European Commission is currently revising both the Horizontal and the Non-Horizontal Merger Guidelines. This revision reflects the need to update the analytical framework of EU merger control in light of structural changes in the economy stemming from digitalisation, data-driven business models, artificial intelligence, and the growing importance of intangible assets. The revision also provides an opportunity to reflect on recent advances in the economic literature on mergers and innovation.<sup>2</sup> Revising the Horizontal and Non-Horizontal Guidelines together is particularly relevant in this context, as mergers often have both horizontal and non-horizontal dimensions. Mergers may not only affect the merging firms' ability and incentives to innovate, but also those of firms outside the merger.

The policy debate surrounding the revision of the Guidelines has also been influenced by broader discussions about the EU's productivity growth and global competitiveness.<sup>3</sup> In particular, concerns have been raised that the EU may generate too few innovative start-ups in emerging industries and that successful firms scale more slowly than in other jurisdictions. Innovation is central to economic growth and consumer welfare. Productivity growth depends not only on the creation of new technologies but also on their diffusion across firms and industries. Competition plays a crucial role in both processes. On the one hand, competitive pressure encourages firms to invest in research and development to gain a competitive advantage. On the other hand, competition also pushes firms to adopt superior technologies developed by others.

The interaction between different types of firms is particularly important in this process. Young innovative firms often experiment with new technological approaches, while large incumbent firms frequently possess complementary assets such as manufacturing capacity, distribution networks, regulatory expertise, and access to large customer bases. These complementary assets can be essential for generating innovations, scaling them, and bringing them to market.

Because of these complementarities, mergers can sometimes accelerate innovation and technology diffusion. However, mergers can also weaken competitive pressure and reduce incentives to innovate. The challenge for merger control is therefore to distinguish between mergers that foster and diffuse innovation to the benefit of consumers and of the economy more broadly and those that reduce innovation and weaken the competitive process.

A balanced approach that carefully weighs innovation harms against credible innovation efficiencies can ensure that EU merger control promotes dynamic competition and long-term consumer welfare.

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<sup>2</sup> Useful overviews include B Cassiman, M Colombo, P Garrone and R Veugelers, 'The Impact of M&A on the R&D Process' (2005) 34(2) *Research Policy* 195–220 ; M L Katz and H A Shelanski, 'Mergers and Innovation' (2007) 74(1) *Antitrust Law Journal* 1–85 ; V Denicolò and M Polo, 'The Innovation Theory of Harm' (2019) 82(3) *Antitrust Law Journal* 921–954 ; G Federico, F Scott Morton and C Shapiro, 'Antitrust and Innovation: Welcoming and Protecting Disruption' (2020) 20 *Innovation Policy and the Economy* 125-190; R J Gilbert and A D Melamed, 'Antitrust for Innovation: A Progress Report' (2025) 86(3) *Antitrust Law Journal* 851–895; Y Lefouili and L Madio, 'Mergers and Investments: Where Do We Stand?' (2026) 105 *International Journal of Industrial Organization* 103269.

<sup>3</sup> N Fabra, M Motta and M Peitz, 'How to Update the EU Merger Guidelines' *VoxEU* (2025).

## 2. Innovation theories of harm

Innovation concerns may arise through several mechanisms in merger analysis. A first and widely discussed mechanism is the loss of independent innovation paths. When firms pursue different technological approaches, competition may take the form of parallel research efforts aimed at developing new products or production processes. A merger between such firms can reduce the number of independent innovation efforts. This reduction in parallel experimentation may slow technological progress. Competition policy has long recognised that mergers may affect innovation even when firms do not yet compete closely in current product markets.<sup>4</sup> In addition, fewer independent research programmes may reduce the diversity of technological approaches, which can weaken innovation competition in industries where progress depends on experimentation across multiple technological trajectories.<sup>5</sup> This concern is particularly relevant in industries where the direction of technological progress is uncertain.

A second innovation theory of harm concerns access to key inputs for innovation. Innovation often depends on specialised assets such as proprietary datasets, highly skilled engineers, intellectual property portfolios, research infrastructure, or access to users and customers. When such inputs are scarce or difficult to replicate, control over them may confer a strategic advantage in innovation competition. A merger may therefore harm innovation if it gives one firm exclusive control over inputs that other firms require in order to develop competing technologies.<sup>6</sup> In such cases, the concern is not only the elimination of a direct rival but also the possibility that the remaining rivals' ability to innovate is weakened because access to critical inputs becomes more limited or more costly. From a competition-policy perspective, this mechanism can be understood as a form of input foreclosure affecting innovation competition.<sup>7</sup>

A third mechanism relates to the diffusion of innovation. Productivity growth depends not only on the creation of new technologies but also on their adoption and deployment across firms and industries. Competition plays an important role in this process because firms under competitive pressure tend to have stronger incentives to adopt superior technologies and improve existing products. If a merger reduces competitive pressure, the merged firm may have weaker incentives to adopt new technologies that could cannibalise existing products or to license innovations to other firms.<sup>8</sup> Diffusion may therefore slow even if the rate of technological progress remains unchanged. Mergers thus affect innovation not only through

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<sup>4</sup> For example, R J Gilbert and A D Melamed, 'Potential Competition and the 2023 Merger Guidelines' (2024) 65 *Review of Industrial Organization* 269–302.

<sup>5</sup> R J Gilbert, 'Competition, Mergers, and R&D Diversity' (2019) 54 *Review of Industrial Organization* 465–484.

<sup>6</sup> See e.g. M Peitz, 'Mergers in Big Tech: Recent Developments in EU and National Case Law' (2023) *Concurrences e-Competitions Art No 115278*. The argument can be applied to acquisitions as *acqui-hires*, as shown in J-M Benkert, I Letina and S Liu, 'Startup Acquisitions: *Acqui-hires* and Talent Hoarding' (2025), *European Economic Review* 105103.

<sup>7</sup> The mechanism is formally developed in M-L Allain, C Chamolle and P Rey, 'Vertical Integration as a Source of Hold-up' (2016) 83 *Review of Economic Studies* 1–25.

<sup>8</sup> G Federico, G Langus and T Valletti, 'Horizontal Mergers and Product Innovation' (2018) 59 *International Journal of Industrial Organization* 1–23.

their impact on research incentives but also through their effect on the adoption and spread of technological progress.

These three mechanisms provide a useful framework for analysing innovation harms in merger control. The current EU Horizontal Merger Guidelines recognise innovation as a parameter of competition but provide limited guidance on how these mechanisms should be assessed in practice. The 2023 US Merger Guidelines address several of these concerns more explicitly, including mergers that eliminate potential competitors and mergers that give firms control over inputs used by rivals to compete.<sup>9</sup>

### 3. Innovation efficiencies

While mergers may harm innovation, they may also generate innovation efficiencies. Efficiencies may arise when firms combine complementary assets that allow them to develop new products more effectively or to deploy technologies more rapidly. For example, firms may bring together technological capabilities, data, engineering expertise, regulatory know-how, or access to customers that support the development and commercialisation of new technologies. The business literature on technology commercialisation has long stressed that the ability to commercialise innovations depends not only on the innovations themselves but also on access to specialised complementary assets; in that sense, a merger can be a means by which complementary assets are brought together.<sup>10</sup> As a result, firms may grow through acquisitions into conglomerates because they accumulate complementary assets that are valuable across multiple markets.<sup>11</sup>

The existence of complementary assets alone does not justify a merger. Many complementarities can also be achieved through contractual arrangements such as licensing agreements, strategic partnerships, or joint ventures. Merger control should therefore require merging parties to demonstrate that claimed efficiencies are merger-specific and cannot realistically be achieved through alternative arrangements. Evidence from biopharmaceutical markets suggests that specialised firms such as contract development and manufacturing organisations can sometimes reduce dependence on incumbent firms, which may affect whether claimed efficiencies are truly merger-specific.<sup>12</sup>

Assessing such efficiencies is complicated by the fact that the relationship between market structure and innovation is complex and depends on market conditions. Innovation incentives may increase with competition up to a certain point but decline when competitive

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<sup>9</sup> US Department of Justice and Federal Trade Commission, *Merger Guidelines (2023) Guidelines 4 and 5.*

<sup>10</sup> D J Teece, 'Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy' (1986) 15(6) *Research Policy* 285–305.

<sup>11</sup> J Chen, M Elliott and A Koh, 'Capability Accumulation and Conglomeratization in the Information Age' (2023) 210 *Journal of Economic Theory* 105647. This perspective may be useful for examining how mergers reshape the distribution of capabilities and how such changes may affect competitive dynamics and market outcomes; see also I Boa, M Elliott and D Foster, 'A Capability Approach to Merger Review' (2023) Cambridge Working Papers in Economics No 2312.

<sup>12</sup> S Moreira, T M Klueter and A Asija, 'Market for Technology 2.0? Reassessing the Role of Complementary Assets on Licensing Decisions' (2023) 52(7) *Research Policy* 104787. The presence of such specialised providers should also be taken into account when assessing the scarcity of the relevant resource or capability.

pressure becomes very strong.<sup>13</sup> Importantly, the impact of mergers on innovation also depends on the technological environment and the nature of innovation competition.<sup>14</sup> In particular, mergers may negatively affect innovation by altering the strategic responses of rival firms, as a reduction in the number of competitors may weaken their incentives to invest in new product development.<sup>15</sup>

Innovation efficiencies may arise in innovation markets, that is, in the process of research and development that may lead to future products or technologies. Because the innovation process is inherently uncertain, firms often pursue multiple technological approaches in parallel, and combining complementary research capabilities may increase the likelihood or speed of successful innovation. In such cases, the relevant question is whether the merger improves the ability and incentives of firms to develop valuable innovations compared with the counterfactual. Because the effects of innovation on consumer welfare are often difficult to quantify at an early stage, the assessment may rely on observable features of the innovation process and the competitive environment, including the extent to which markets remain open to experimentation and entry. In addition, efficiencies outside the relevant market—such as environmental improvements or broader technological spillovers—may be claimed, but they should be considered only where they are merger-specific and sufficiently substantiated.

In practice, the assessment of innovation efficiencies requires a structured approach. Competition authorities should examine (i) whether the merger creates capabilities that facilitate innovation, (ii) whether the merged firm has incentives to pursue those innovations, and (iii) whether the claimed efficiencies are merger-specific. Only efficiencies that are sufficiently substantiated and likely to benefit consumers should be taken into account in the merger assessment. This approach builds on the framework set out in the 2004 EU Horizontal Merger Guidelines and offers a clearer analytical structure for assessing and substantiating innovation efficiencies.<sup>16</sup>

#### **4. Start-up acquisitions**

Start-ups play a central role in innovation ecosystems. Many important innovations originate from small firms that experiment with new technologies, business models, or scientific approaches. Yet start-ups often lack the complementary assets and organisational capabilities required to commercialise their innovations at scale. Acquisitions can therefore play an important role in the innovation process. By combining a target's technological capabilities with an acquirer's manufacturing, distribution, engineering, regulatory, data, or marketing assets, acquisitions may accelerate product development, deployment, and

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<sup>13</sup> The seminal article is P Aghion, N Bloom, R Blundell, R Griffith and P Howitt, 'Competition and Innovation: An Inverted-U Relationship' (2005) 120(2) *Quarterly Journal of Economics* 701–728.

<sup>14</sup> Gilbert, 'Competition, Mergers, and R&D Diversity' (2019).

<sup>15</sup> A D'Annunzio, B Jullien, Y Lefouilli and L Madio, 'Mergers and Investments in New Products' (2025) Toulouse School of Economics Working Paper No 949.

<sup>16</sup> The 2004 EU Horizontal Merger Guidelines require efficiencies to be merger-specific, verifiable, and likely to benefit consumers. Relatedly, the 2023 US Merger Guidelines state that claimed efficiencies must be substantiated and merger-specific when assessing merger effects.

diffusion. The prospect of a profitable exit may also strengthen ex ante incentives for entrepreneurial entry and venture-capital investment.

These considerations are especially important in digital markets and biopharmaceuticals. In digital markets, scale may be needed early because product quality and competitive viability often depend on installed base, user participation, and access to data. In such settings, rapid scaling is often part of the competitive process itself. In biopharmaceuticals, scale and complementary assets are equally important, but the timing is often different. Early-stage firms may generate valuable discoveries long before they can independently conduct late-stage clinical trials, obtain regulatory approval, organise manufacturing, and build a sales force. The need for scale therefore often becomes decisive later, at the commercialisation stage rather than at an initial development stage. That difference matters for merger policy: in both sectors, acquisitions may create real efficiencies, but the nature and timing of those efficiencies differ.

At the same time, acquisitions of innovative start-ups can raise serious competition concerns. A first concern is the loss of a future competitor. Even where the target has little current market presence, the transaction may remove an independent innovation path or eliminate a nascent challenger that would otherwise have grown into a competitive constraint. A second concern is the acquisition of scarce inputs for innovation, including data, talent, intellectual property, interfaces, or access to customers. In that case, the issue is not only whether the target would itself have become a major rival, but also whether the merger deprives other firms of assets or capabilities they need to innovate. These concerns are particularly acute when dominant incumbents acquire start-ups in concentrated markets characterised by innovation-driven competition for the market.

This is the setting in which the literature on killer acquisitions is relevant, but the concept should be used carefully. In the narrow sense, a killer acquisition refers to a transaction in which an incumbent acquires a potentially competing project and then shelves or discontinues it to protect existing profits. That mechanism has been documented most clearly in pharmaceuticals, where overlapping drug projects can be identified and post-acquisition development choices can be observed.<sup>17</sup> But the broader competition concern is not limited to literal shelving. An acquisition can reduce innovation even when the target technology continues to be developed, if the merged firm redirects the project, slows it down, limits its scope, or integrates it in a way that weakens future rivalry.

The relevant question for merger control is broader than whether a project is killed. It is whether the acquisition softens innovation competition, reduces the number of independent technological bets, or weakens the ecosystem-wide incentives of entrepreneurs and investors to contribute to innovation. Recent contributions to economic theory highlight these effects. The prospect of acquisition may encourage entry and innovation by providing an exit opportunity, but it may also reduce future competition when dominant incumbents acquire

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<sup>17</sup> C Cunningham, F Ederer and S Ma, 'Killer Acquisitions' (2021) 129(3) *Journal of Political Economy* 649–702.

potential challengers.<sup>18</sup> Acquisitions can stimulate innovation in the short term by creating an “innovation-for-buyout” motive, yet repeated acquisitions by dominant incumbents may entrench market power and reduce innovation in the long term.<sup>19</sup>

Anticipating acquisition may also affect which projects start-ups pursue. The prospect of a buyout can distort the allocation of R&D effort across different technological projects, potentially altering both the technological direction of innovation and the product positioning chosen by start-ups.<sup>20</sup> Acquisition incentives may also affect the incumbents’ R&D allocation: when an acquisition is possible, both the incumbent and the start-up strategically adjust their innovation portfolios, which may lead to a “kill zone” around the incumbent’s core products.<sup>21</sup>

Empirical evidence is consistent with a nuanced approach. International firm-level evidence suggests that start-up targets are highly innovative before acquisition, but that their patenting activity often declines afterwards, without a corresponding increase in the acquiring firm’s innovation.<sup>22</sup> Other empirical work indicates that acquisitions by large technology firms may reduce venture-capital investment in related technology areas, pointing to effects that extend beyond the merging parties themselves.<sup>23</sup> These findings do not imply that many or most start-up acquisitions are harmful. They do, however, suggest that merger control should look not only at the target’s current product-market overlap, but also at the effects of the merger on the innovation process.

For the revised Guidelines, the practical implication is straightforward. The assessment of start-up acquisitions should be neither systematically suspicious nor systematically permissive. It should distinguish transactions that combine complementary assets in ways that genuinely accelerate innovation and diffusion from those that remove future challengers, neutralise disruptive threats, or give dominant firms privileged control over scarce innovation inputs, thereby reducing the scope for future entry and innovation.

## 5. Implications for the revision of the EU Merger Guidelines

The ongoing revision of the EU Merger Guidelines provides an opportunity to clarify how merger control should assess the effects of mergers on innovation, product quality, variety,

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<sup>18</sup> M Motta and M Peitz, ‘Big Tech Mergers’ (2021) 54 *Information Economics and Policy* 100868; for the effect of merger policy on innovation and competition see also I Letina, A Schmutzler and R Seibel, ‘Killer Acquisitions and Beyond: Policy Effects on Innovation Strategies’ (2024) 65(2) *International Economic Review* 591–622.

<sup>19</sup> V Denicolò and M Polo, ‘Acquisitions, Innovation and the Entrenchment of Monopoly’ (forthcoming) *RAND Journal of Economics*.

<sup>20</sup> R J Gilbert and M Katz, ‘Dynamic Merger Policy and Pre-merger Product Choice by an Entrant’ (2022) 81 *International Journal of Industrial Organization* 102812; E S R Dijk, J-L Moraga-González and E Motchenkova, ‘How Do Start-up Acquisitions Affect the Direction of Innovation?’ (2024) 72(1) *Journal of Industrial Economics* 118–156.

<sup>21</sup> E S R Dijk, J-L Moraga-González and E Motchenkova, ‘Start-up Acquisitions, Strategic R&D, and the Entrant’s and Incumbent’s Direction of Innovation’ (2025) 34(2) *Journal of Economics & Management Strategy* 428–456.

<sup>22</sup> M Berger, S Calligaris, A Greppi and D Kirpichev, ‘Acquisitions and their Effect on Start-up Innovation: Stifling or Scaling?’ (2025) OECD Science, Technology and Industry Working Papers No 2025/10. The paper uses a global firm-level dataset linking start-up data (Crunchbase/Dealroom), M&A transactions (Orbis), and patent data (EPO PATSTAT), covering about 90,000 start-ups and 18,000 acquisitions across 60 countries between 2001 and 2021.

<sup>23</sup> K Gugler, F Szücs and U Wohak, ‘Start-up Acquisitions, Venture Capital and Innovation: A Comparative Study of Google, Apple, Facebook, Amazon and Microsoft’ (2025) 99 *International Journal of Industrial Organization* 103148.

and prices. The current EU Merger Guidelines already recognise that mergers may affect innovation and other non-price dimensions of competition. However, they provide only limited guidance on how innovation harms and innovation efficiencies should be analysed in practice. Greater clarity could help explain how such effects should be assessed, particularly in settings where innovation outcomes are uncertain and difficult to quantify at an early stage. For comparison, the 2023 US Merger Guidelines address innovation competition more explicitly, including the possibility that mergers may reduce incentives to develop new products or limit competition in research and development.

First, the Guidelines could provide more explicit guidance on innovation theories of harm. In particular, they could address the loss of independent innovation paths, reduced access to key inputs for innovation, and reduced incentives for the adoption and diffusion of new technologies. These issues may also arise in the context of acquisitions of innovative start-ups, where the target may represent a future competitor or hold assets that are important for the innovation activities of other firms.

Second, the Guidelines could clarify how innovation efficiencies should be assessed in practice. In particular, the analysis may consider whether the merger combines complementary assets and capabilities that facilitate innovation, whether the merged firm has incentives to pursue those innovations, and whether the claimed efficiencies are verifiable and merger-specific. Given the uncertainty inherent in innovation markets, such an approach may help ensure that the assessment remains workable in practice while remaining anchored in consumer welfare. In doing so, it should take into account effects not only on innovation but also on price, quality, and product variety.

Such clarifications would improve legal certainty and help ensure that EU merger control is flexible enough to address future challenges in innovation-driven markets, while keeping merger assessment focused on effective competition and consumer welfare.