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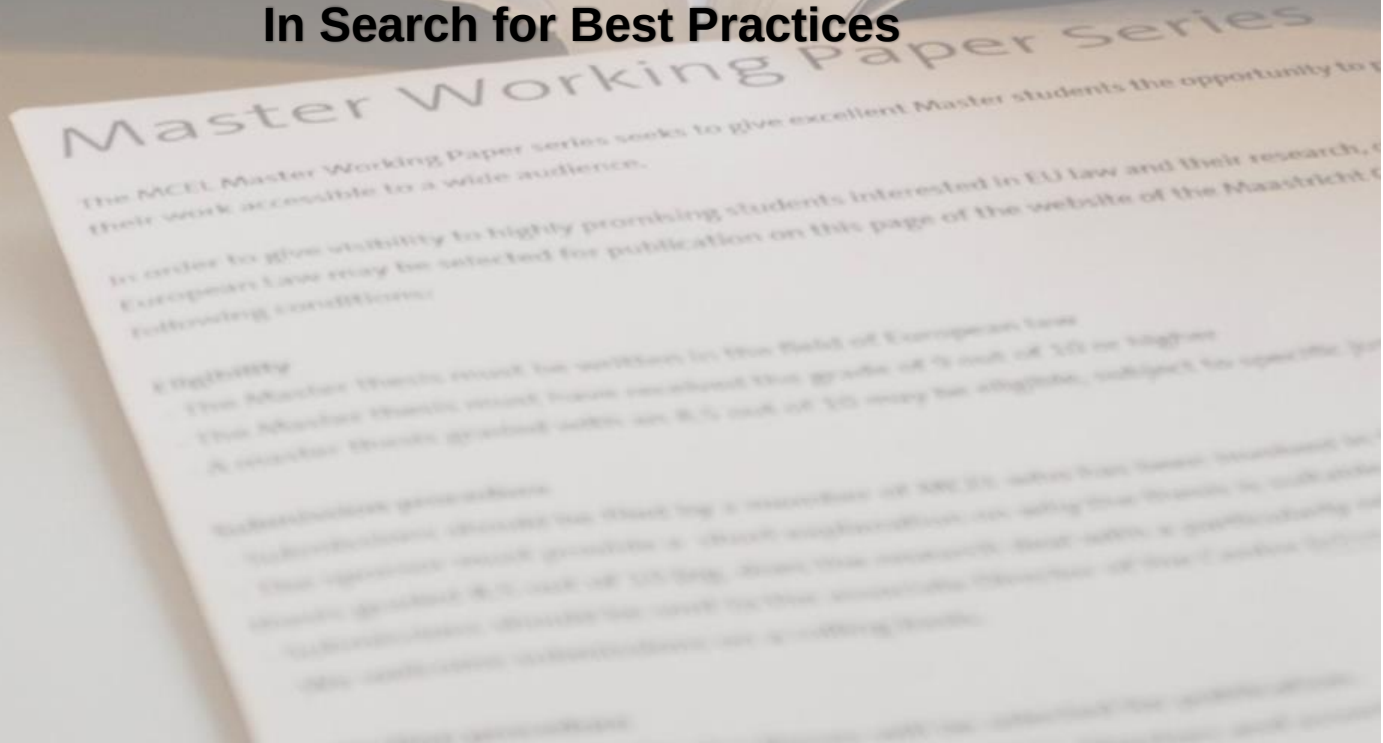
Innovation in the EU Merger Control Battlefield: In Search for Best Practices



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1. Introduction

Innovation is considered to be the main driving force for globalization and economic growth in the Europe 2020 Strategy.[1] It is said to speed up economic recovery, create jobs and improve competition.[2] Innovation can influence competition, just like competition can influence innovation incentives.[3] Commissioner Versager recognizes this interplay, stating that the protection of innovation 'is an essential part of competition enforcement'.[4] This manifests itself through the recent merger control practice of the European Commission (hereafter 'EC') in which innovation effects are increasingly assessed. Generally, significant impediments to effective competition in (substantial parts of) the common market render a merger incompatible, in particular as a result of the creation or strengthening of a dominant position.[5] Such anti-competitive impediments can consist out of higher prices, lower output or, as recently illustrated by the EC's practice, a reduction of innovation.[6] The *theory of harm* entailing an innovation loss is based on undertakings competing by developing or improving new products and processes, rather than engaging in price competition. The theory of harm responds to the evolution of time in light of the increased development of innovative products. It may however be questioned whether the framework establishing this theory of harm is sufficiently precise in providing guidance to the EC. An adequate framework would set out clear guidelines and principles concerning the EC's assessment of innovation effects. The principles and guidelines in the framework are there to avoid the frustration of legitimate expectations.[7] Without a (sufficiently

[1] Inge Graef, 'Chapter 3: Evaluating the Link Between Competition and Innovation', in: Inge Graef, EU Competition Law, Data Protection and Online Platforms: Data as Essential Facility. *International Competition Law Series*, Volume 68 (2016), p. 60; Johannes Laitenberger, 'Competition and Innovation', speech at the CRA annual Brussels Conference. Brussels: 9 December 2015. Retrieved from http://ec.europa.eu/competition/speeches/text/sp2015_04_en.pdf, last visited on 18 July 2017.
[2] European Commission Press Release Database, *Turning Europe into a true Innovation Union* (MEMO/10/473) (6 October 2010).
[3] OECD/Eurostat, *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data*, 3rd edition. Paris: OECD Publishing (2005), p. 19.
[4] Margrethe Vestager, 'How competition supports innovation', speech at Regulation4Innovation. Brussels: 24 May 2016. Retrieved from https://ec.europa.eu/commission/commissioners/2014-2019/vestager/announcements/how-competition-supports-innovation_en, last visited on 17 July 2017.
[5] Council Regulation (EC) 139/2004, Article 2(3).
[6] Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2004/C 31/03), para. 8; Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2008/C 265/07), para. 10; Laitenberger (n. 1).
[7] Nicolas Petit, *Significant Impediment to Industry Innovation: A Novel Theory of Harm in EU Merger Control?* [White Paper]. Portland: International Center for Law & Economics (2017), p. 10.

precise) framework, the decisional practice of the EC possibly lacks consistency, so that the EC is free to conduct its assessment in a different way each time. Such inconsistent practice will harm legal certainty, because merging parties will not be able to regulate their conduct on the basis of what they may expect from the law. The boundaries of the framework thus determine the EC's discretion when assessing innovation effects and the degree of legal certainty for merging parties. Without an adequate framework, the EC could draw its conclusions arbitrarily, constituting an obstacle to legal practice when lawyers are to advice merging entities. The purpose of this research is therefore to clarify how the current EU legal merger control framework creates a legal basis for assessing innovation effects and how the principles in the framework are applied in the EC's decisional practice. If there appear to be any loopholes between the framework and the decisional practice, this research shall set out best practices that the EC can apply to complement the legal framework. Such best practices constitute alternative techniques complementing the legislated assessment method, so that superior results in terms of legal certainty can be achieved in comparison to the current assessment method. The choice is made for best practices rather than a legal framework, as the latter would require an economic analysis falling outside the scope of this research. This research accordingly answers to the question 'Which best practices can be developed to assess 'innovation' in EU merger control?', on the basis of the following sub-questions: (i) 'What does 'innovation' in EU merger control mean and (why) does it render merger control more complex?' in chapter 2; (ii) 'How does the EC assess *innovation* in EU merger control?' in chapter 3; and (iii) 'What consequences of the EC's innovation assessment can merging parties encounter during EU merger control procedures?' in chapter 4.

2. The *Innovation* Concept

This research starts with an attempt to define *innovation*, because it is impossible to assess how a merger can affect innovation without understanding what it means.

2.1. Types of Innovation

2.1.1. A General Definition

In the Innovation Union plan, innovation is defined as 'the change that speeds up and improves the way we conceive, develop, produce and access new products, industrial processes and services'.[8] Yet, no single definition is given.[9] The Oslo Manual on Guidelines for collecting and interpreting innovation data for example refers to innovation as 'the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations'.[10] According to the manual, the minimum requirement for innovation is that the product, process marketing method or organisational method is 'new (or significantly improved) to the firm'.[11] The manual distinguishes between product innovation, process innovation, marketing innovation and organisational innovation.[12] Each type of innovation may be analysed during merger assessments, though the first two are most likely to be addressed in light of their nature.

2.1.2. Sustaining vs Disruptive Innovation

Innovating firms have the choice to pursue disruptive or sustaining innovation. Sustaining technologies trigger the improvement of an existing product.[13] The innovation is of incremental nature when it concerns an improvement expected by customers and of radical nature when it goes beyond customers' expectations.[14]

[8] European Commission Press Release Database (n. 2), p. 1.
[9] Ibid.
[10] OECD/Eurostat (n. 3), p. 46.
[11] Ibid.
[12] Ibid, p. 47.
[13] Inge Graef & Sih Yuliana Wahyuningtyas & Peggy Valcke, *How Google and others upset competition analysis: disruptive innovation and European competition law* [Conference Paper]. Brussels: 25th European Regional Conference of the International Telecommunications Society (ITS) 22-25 June 2014, p. 2.
[14] Graef (n. 1), p. 69.

Sustaining technologies do not affect established markets,[15] so that there is competition *in* the already existing market.[16] Sustaining innovation relates to static competition,[17] which occurs when firms pursue productive and allocative efficiency by competing to operate at the lowest cost and by using their limited resources in the most optimal manner.[18] In such a competitive environment, the most efficient products are those priced lowest.[19]

Alternatively, disruptive technologies lead to the development of new products and processes at such rapid speed that new products exceed existing markets.[20] Disruptive technologies initially only appeal small or emerging markets, as they do not meet the demands of mainstream customers. Disruptive innovation therefore differs from incremental or radical innovation. The latter is characterized by technologies corresponding to mainstream customers' expectations, so that customers value the development from the beginning.[21] Because disruptive innovation touches upon new markets, one may speak of competition *for* the market.[22] This is related to dynamic competitive environments,[23] in which undertakings seek dynamic efficiency to create products with the highest quality in new markets.[24] Monopolies are not uncommon in disruptive technology markets. These continue to exist until a new disruptive innovator overturns them.[25] Whereas newcomers thus often relate to disruptive technologies by competing *for* the market, leading firms have a tendency to compete *in* the market. The latter is due to a preference for sustaining innovation in light of customers' expectations and customer satisfaction. Note also that disruptive innovation is often found in contestable markets, where there are low barriers to entry and exit. This is characterized by new players to entering the market, which can lead to lower prices, but may also decrease competitors' incentives to innovate in light of the lower profits they will gain from their investments.

[15] Ibid.
[16] Ibid, p. 70.
[17] Graef & Wahyuningtyas & Valcke (n. 13), p. 3.
[18] Ibid, p. 2.
[19] Ibid.
[20] Ibid; Graef (n. 1), p. 69.
[21] Graef, (n. 1), p. 69-70.
[22] Ibid; Graef & Wahyuningtyas & Valcke (n. 13), p. 3; Fay Kartner, 'Merger remedies: fostering innovation?'. *European Competition Journal*, Volume 12, issue 2-3 (2016), p. 301.
[23] Graef & Wahyuningtyas & Valcke (n. 13), p. 3.
[24] Graef, (n. 1), p. 71.
[25] Ibid.

Sustaining and disruptive innovation are not mutually exclusive. A merger may cause static (allocative) inefficiency, leading to higher prices and lower output in the relevant market, while at the same time improving dynamic efficiency, eventually leading to more and better innovation.[26] Such scenarios require the EC to balance efficiencies against each other when clearing a merger.

2.2. Legal Perspective: Innovation in the EU (Non-)Horizontal Merger Guidelines

The EU Horizontal Merger Guidelines and the EU-Non Horizontal Merger Guidelines (hereafter 'HMG' and 'NHMG' respectively, together referred to as 'the Guidelines') cover different theories of harm to refuse merger clearance: diminished innovation, price increase and reduced output, consumer choice or quality.[27] The HMG state that a merger between two important innovators or a merger eliminating a firm with promising pipeline products can eliminate an 'important competitive force', possibly leading to a 'significant impediment of effective competition'.[28] A definition of innovation is however not included in the HMG. The HMG merely indicate that a firm's innovative potential should be taken into account when assessing mergers regardless of the firm's current market position.[29] The rationale being that firms with a small market share can also be important competitors when they have promising pipeline products.[30] The latter has been repeated, albeit indirectly, in the NHMG. These state that the EC is not likely to investigate mergers where the post-merger market share is below 30%, unless one of the merging parties is likely to expand in the near future following recent innovations.[31] The NHMG furthermore only refer to innovation by indicating that a vertical merger can align parties' incentives to invest in new products, new production processes and the marketing of products.[32]

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[26] Simon Baxter & Frederic Depoortere & Athanasia Gavala, 'Developments in the treatment of innovation in EU merger control'. *Competition Law & Policy Debate*, Volume 2, issue 3 (2016), p. 67.
[27] Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2004/C 31/03), para. 8; Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2008/C 265/07), para. 10.
[28] Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2004/C 31/03), para. 38.
[29] Ibid.
[30] Ibid; Ingrid Vandenborre, 'The importance of the new: Competition innovation in life sciences'. *Competition Law Insight* (14 February 2017), p. 16. Retrieved from: https://www.skadden.com/insights/publications/2017/02/the-importance-of-the-new-competition.
[31] Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2008/C 265/07), para. 25, 26.
[32] Ibid, para. 57.

The EC has the discretion to conduct a case-by-case analysis. The boundaries of this analysis are formed by parties' legitimate expectations to the extent that they can be justified on the basis of the EC's previous decisional practice.[33] It is however hard to create legitimate expectations when the assessment of innovation effects remains ambiguous. As the EC is thus not limited by any legitimate expectations, it remains free to assess innovation effects differently in each merger analysis.

2.3. Economic Perspective: The Link between Innovation and Competition

Different economic theories have been developed in an attempt to clarify the link between innovation and competition.

According to Joseph Schumpeter, less intense competition and higher concentration increase post-innovation rewards for the innovator,[34] who is often a monopolist. His school of thought believes that such rewards increase incentives to re-engage in research and development (hereafter 'R&D') to re-innovate.[35] The rationale of the theory is characterized by the belief that undertakings facing a higher level of competition might profit less from their investments.[36] Schumpeter believes that monopolies have better prospects of benefitting from their inventions, increasing their innovation incentives and capacity to re-invest in R&D,[37] also referred to as *appropriability*.[38] A monopolist can accordingly keep its monopolist position by continuing to innovate and appropriating the benefits thereof.[39] In the same context, Schumpeter developed an economic theory of innovation called *creative destruction*.[40] This theory, also known as *cannibalization*, reflects the process through which newer products replace older products developed by the same innovator.[41] Shortly said, Schumpeter thus believes that less competition in a market leads to more innovation

[33] Petit (n. 7), p. 10.
[34] Raphaël De Coninck, 'Innovation in EU merger control: in need of a consistent framework'. *Competition Law & Policy Debate,* Volume 2, issue 3 (2016), p. 43.
[35] Competition Directorate-General of the European Commission, 'EU merger control and innovation', *Competition Policy Brief*, issue 1 (2016), p. 1. Retrieved from: http://ec.europa.eu/competition/publications/cpb/2016/2016_001_en.pdf, last visited on 24 August 2017.
[36] De Coninck (n. 34), p. 43.
[37] Graef (n. 1), p. 60.
[38] RBB Economics, 'An innovative leap into the theoretical abyss: Dow/Dupont and the Commission's novel theory of harm', *Brief 54* (July 2017), p. 2. Retrieved from http://www.rbbecon.com/downloads/2017/07/RBB-Brief-54.pdf, last visited on 17 July 2017.
[39] Graef (n.1), p. 61.
[40] Ibid; RBB Economics (n.38), p. 1.
[41] Ibid.

in industries where competition is less about price or output and more about the development of new products or services, following appropriability and cannibalization.[42]

On the contrary, Kenneth Arrow believes that less intense competition and thus higher concentration decreases innovation incentives.[43] He concluded that intense competition stimulates competitors to innovate, because they would want to outperform their competitors by developing new products.[44] More competition would accordingly lead to increased innovation. Arrow also considered Schumpeter's theory on monopolies' innovation incentives based on appropriability. He concluded that these incentives do not outbalance innovation disincentives created by the need to re-invest profits that the monopoly could keep without further innovating in new R&D projects.[45]

Carl Shapiro made an interesting attempt to reconcile the conflicting theories of Schumpeter and Arrow.[46] He concluded that, regardless the missing link between innovation and competition, three converging principles determined innovation incentives: contestability, appropriability and synergies.[47] Each principle can be applied to innovation in merger control. First, the *contestability principle* holds that protecting profitable sales by providing greater customer value stimulates innovation.[48] The EC should accordingly assess whether a merger will significantly reduce competitive pressure on innovation. Second, the *appropriability principle* comprises that a higher level of appropriability stimulates innovation.[49] The EC should therefore assess whether the merged entity gains extra benefits from its innovation and/or intellectual property rights. Lastly, the *synergies principle* holds that combined complementary assets increase innovation capabilities and accordingly stimulate innovation.[50] The EC should therefore assess to what extent a merger combines complementary assets and the effects thereof on competition. Even though none of the economic theories succeeded in creating a general presumption connecting

[42] Competition Directorate-General of the European Commission (n. 35), p. 1.
[43] De Coninck (n. 34), p. 43.
[44] Competition Directorate-General of the European Commission (n. 35), p. 2.
[45] Graef (n. 1), p. 62.
[46] Ibid, p. 64-67.
[47] Ibid, p. 67; De Coninck (n. 34), p. 43-44.
[48] Ibid.
[49] Ibid.
[50] Ibid.

innovation to competition,[51] the three principles developed by Shapiro can be applied on a case-by-case basis.

2.4. Different Markets

A case-by-case innovation analysis requires a complex *ex ante* assessment of effects that will only manifest themselves in the future. Such assessment is even more complex when it concerns disruptive innovation involving products or processes for which no markets exist (so far). The EC distinguishes between *competition in existing markets* and *competition in innovation*.[52] The former refers to competition in existing markets for existing products. The latter is characterized by R&D investments to develop products or processes competing with existing products or relating to new product markets.[53] Looking back at the different types of innovation, these R&D investments are featured in existing markets (sustaining innovation) or future markets (disruptive innovation). Especially the latter category proves difficulties as it concerns a pre-merger analysis of future products' effects on future markets. In the pharma-sector, this complexity has been addressed by assessing innovation on the basis of clinical trial reviews and analyses of pipeline products' development stages (phase I, II or III).[54] In other industries, such development stages have not (yet) been established, rendering the assessment of innovation levels more challenging.

2.5. Determinants of Innovation

Since innovation is not defined and a general presumption on the link between innovation and competition is missing, this section seeks to identify determinants to measure innovation in EU merger control. These are distinct from competition indicators, like the so-called Herfindahl-Hirschman Index to measure market concentration and the Lerner Index to measure price-cost margins.[55] The main

[51] Petit (n. 7), p. 11; Graef (n. 1), p. 68.
[52] Luc Gyselen, 'Competition in innovation: a novel concept? The case law on pharmaceuticals', in Paul Lugard & Leigh Hancher, *Current issues in competition law and policy / Liber Amoricum Peter Plompen.* Intersentia: Antwerpen (2005), p. 33.
[53] Ibid.
[54] Yvo De Vries, 'Concentratiecontrole en innovatie: tijd voor iets nieuws?'. *Tijdschrift mededingingsrecht in de praktijk*, issue 5 (2016), p. 17; Note that reference to 'phase I, II or III' relates to clinical trials' development stages, whereas reference to 'phase 1 or 2' refers to the phase of the merger assessment.
[55] Graef (n. 1), p. 56.

quantitative indicators for innovation are R&D investments, patent counts and market share.[56] Qualitative determinants fall outside the scope of this research because they are too market-specific and thus less relevant for the development of best practices applicable to all sectors.[57]

2.5.1. Research and Development

R&D input reflects inventive activity and is a prerequisite to achieving innovative output.[58] A sole focus on R&D input however ignores the unpredictability of R&D output and undertakings' inefficient R&D input.[59] Especially in light of unrealized envisaged R&D output, one may question the link between R&D and innovation. An approach solely focussing on R&D input rather than competitive aspects of output is thus an imperfect determinant of innovation.[60] Ultimately, increased R&D input is not always followed by increased innovation.[61]

2.5.2. Patents

Patents grant inventors methods to sell or license their intangible assets and innovative ideas.[62] Patents thus reflect innovative processes. This does however not automatically mean that they also reflect innovative progress. Not all patented ideas are brought to the market or lead to the development of a new product or process. Not all patents have the same commercial value and they are only granted for a temporary duration.[63] Some technologies are not patentable and above all, not all innovations are patented. Because an undertaking's number of patents possibly presents a misleading image of that undertaking's strengths as an innovator, patent counts do not constitute an adequate innovation determinant.[64] Ultimately, patent counts do not directly reflect the competitive position of a firm in the market.[65]

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[56] Ibid, p. 56-57.
[57] An example of a qualitative determinant is the increased plant resistance in the agro-chemical sector.
[58] Catalin Stefan Rusu & Benjamin Mooij, 'Innovation and EU Competition Law: In Need of a Narrative for Where the Money is Put'. *Legal Issues of Economic Integration 43*, issue 2 (2016), p. 179; Graef (n.1), p. 58.
[59] Baxter & Depoortere & Gavala (n. 26), p. 67.
[60] Ibid.
[61] Graef (n. 1), p. 58.
[62] Rusu & Mooij (n. 58), p. 178.
[63] Graef (n. 1), p. 57.
[64] Petit (n. 7), p. 18.
[65] Ibid, p. 19.

2.5.3. Market Share

One may question the adequacy by which high market shares reflect the market position of an undertaking in light of its innovation activities. Some undertakings contribute actively to innovation, but lack market share when engaging in disruptive technologies for which no market exists yet. Other undertakings have a high market share, but lack innovation incentives following large R&D investments that would be required. This illustrates that market share is an imperfect innovation determinant. Depending on entry barriers,[66] undertakings with high market shares may ultimately not be considered dominant when they operate at a low innovative level.[67]

2.6. Complexity of Assessing Innovation Effects

The merger assessment of innovation effects is rather complex following the lack of a definition and determinants of innovation. From a legal perspective, the Guidelines provide 'a reduction in innovation' as a refusal ground, but fail to define what it precisely entails. Also from an economic perspective, no adequate theory has been developed (so far) to create a link between innovation and competition in such a way that it may serve as a basis for a framework against which innovation can be measured for the purpose of consistently assessing mergers. This reflects the need for more clarity on innovation's meaning and assessment method. A legal framework based on economic analysis goes beyond the scope of this research, but could be a good way forward. Alternatively, best practices could be developed to guide the EC in its innovation assessment by supplementing the current framework. They constitute an alternative technique to complement the legislated assessment method. The development of best practices first requires an assessment of the current decisional practice, which shall take place in the next chapter (chapter 3). The best practices are developed in chapter 5.

[66] Pablo Ibáñez Colombo, 'Restrictions on innovation in EU competition law'. *European Law Review,* Volume 41, issue 2 (2016), p. 204.
[67] Kartner (n. 22), p. 301.

3. The EU Approach

Legal certainty is harmed by the complexity of a merger's innovation effects assessment. This research assesses whether that negative effect can be outweighed by a consistent EC decisional merger practice in light of the framework in which it currently operates.

3.1. Assessment of Negative Effects

3.1.1. Framework

The framework on the basis of which the EC assesses mergers' innovation effects is rather limited. This is not very surprising, since it is inherently difficult to address the uncertainty of not knowing how technology and accordingly the market shall develop.[68] The HMG and NHMG put the competitive harm caused by a loss of innovation on equal footing with price increases and reductions of output, choice or quality of goods and services,[69] regardless of the merging parties' market share.[70] Accordingly, potential competitors not yet active in the market and competitors developing products likely to compete in future markets can be subject to the EC's Significant Impediment to Effective Competition (hereafter 'SIEC') analysis.[71]

The HMG prescribe two conditions that should be fulfilled as a prerequisite to deciding that a horizontal merger with a potential competitor has a significant anti-competitive effect. First, the potential competitor should exert a significant constraining influence or there should be a significant likelihood that the potential competitor would become an effective competitor. Second, there should be an insufficient number of remaining potential competitors that could maintain competitive pressure after the merger.[72] The NHMG prescribes another framework. First, access to supplies or markets by actual or potential rivals should be hampered or eliminated as a

[68] Ibid, p. 303.
[69] Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2004/C 31/03), para. 8; Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2008/C 265/07), para. 10.
[70] Ibid, para. 38.
[71] Competition Directorate-General of the European Commission (n. 35), p. 3.
[72] Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2004/C 31/03), para. 60; *Medtronic/Covidien* (COMP/M.7326) [2014] L-2985, para. 178.

consequence of the merger.[73] A complete exit from the market is not required since a mere disadvantageous position leading to less effective competition is sufficient, as long as it reduces those competitors' ability and/or incentives to compete.[74] Second, the merged entity should be able to profitably increase customers' prices. If these conditions are not fulfilled, the foreclosure cannot be anti-competitive.[75] Lastly, the NHMG distinguish input foreclosure from customer foreclosure. The former reflects increased costs for downstream rivals that restrict their access to important input. The latter occurs when upstream rivals' access to a sufficient customer base is restricted.[76]

3.1.2. Practice

This section analyses the EC's decisional practice, because the legal framework is rather limited and does not explicitly address how the EC should assess innovation.[77]

(a) Horizontal Mergers

In horizontal mergers, the EC assesses whether a concentration would significantly impede effective competition, in particular as a result of the creation or strengthening of a dominant position.[78] The EC starts its analysis by defining the relevant product and geographic market. It continues with a competitive assessment of the merger,[79] usually taking into account buyer power, the extent of entry barriers and possible efficiencies.[80] The latter relate to the positive effects of a merger, which shall be dealt with in section 3.3 of this chapter. Generally, a horizontal merger can lead to non-coordinated effects by eliminating important competitive constraints or to coordinated effects by changing the nature of competition so that previously not coordinating firms would or could start to coordinate their behaviour.[81]

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[73] Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2008/C 265/07), para. 29.
[74] Ibid.
[75] Ibid.
[76] Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2008/C 265/07), para. 30.
[77] The cases discussed are selected on the basis of their prominent position in recent literature and media covering the subject of this thesis.
[78] Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2004/C 31/03), para. 1.
[79] Ibid, point 10.
[80] Ibid, point 12.
[81] Ibid, point 22.

(i) *Medtronic/Covidien*

The EC conditionally cleared the acquisition of medical devices manufacturer Covidien with Medtronic, an undertaking active in medical technologies and therapies, on the condition that Covidien would divest its pipeline product *Stellarex*, a promising drug coated balloon, following an overlap with Medronic's existing drug coated balloon *In.Pact.*[82] The EC appears to have stepped outside the framework by applying a so-called *test of elimination of future competition* when assessing a merger's potential anti-competitive effects.[83] The EC considered that even though Covidien could not yet exert competitive pressure because *Stellarex* was still an off-market pipeline product, it was sufficiently certain that *Stellarex* would compete with Medtronic's *In.Pact* when launched on the market.[84] This scenario differs from *potential competition*, as addressed in the HMG. If Covidien were a potential competitor, it could easily enter the market creating a threat of imminent market entry, even when not followed by actual entry.[85] That sole threat would already exert a disciplining effect on the market, whereas pipeline products do not produce such constraining effects until the moment the pipeline product is actually launched on the market.[86] Accordingly, Covidien and Medtronic were no actual or potential competitors in light of the HMG.[87]

In application of the test of elimination of future competition, the EC assessed the consequences of the merger on future competition in the relevant market when the pipeline product would not be launched.[88] Evidently, the EC did not assess market share, since pipeline products did not yet occupy a market.[89] The EC considered that the post-merger elimination of Covidien's pipeline product would eliminate a credible competitor in a market in which it, without the merger, would have constrained Medtronic, the pre-merger market leader.[90] The EC based this conclusion on interviews with Key Opinion Leaders covering the pipeline product.[91] It held that insufficient post-merger competitive pressure would be exerted on the merged entity, triggering a significant effect on innovation.[92] This was due to Covidien's reduced

[82] *Medtronic/Covidien* [2014] (n. 72), para. 179.
[83] Ibid, para. 180.
[84] Ibid, para. 179.
[85] Ibid.
[86] Ibid.
[87] Ibid.
[88] De Vries (n. 54), p. 17.
[89] Ibid; *Medtronic/Covidien* [2014] (n. 72), para. 180.
[90] *Medtronic/Covidien* [2014] (n. 72), para. 248.
[91] Ibid, para. 204, 236.
[92] Ibid, para. 231, 248, 249.

innovation incentives, implying that Covidien would no longer invest in clinical trials to develop *Stellarex* into a with *In.Pact* competing product.[93] Following, there would be a deprivation of an innovative and potentially very effective product.[94]

(ii) *Novartis/ GSK Oncology Business*

The EC conditionally approved the acquisition of GlaxoSmithKline (hereafter 'GSK') oncology business by Novartis, on the condition that Novartis divested two of its pipeline therapies to block tumour growth in a number of different cancers,[95] the B-Raf inhibitor LGX818 and MAK inhibitor MEK162, due to an overlap with GSK's pipeline therapies.[96] Because a successful trial requires the filing of authorization to market a specific product for a specific cancer, the EC investigated the MEK and R-Baf inhibitor with respect to each cancer type for which they were undergoing clinical trials.[97]

In its analysis, the EC emphasized that mergers may not only affect competition in existing markets, but also in innovation and new product markets.[98] Doing so, it cleared the way for deciding that the overlap between the parties' phase III clinical trials for a specific ovarian cancer created anticompetitive effects.[99] Since there was only one other party conducting competing phase II clinical trials,[100] the merger would reduce the available treatments from three to two, thereby creating a duopoly.[101] The EC considered that the merged entity's post-merger innovation incentives would be reduced. Pre-merger, such incentives were to be driven by the parties' future sales generated by their research programs. Since those research programs ran in parallel, the EC figured that the merger would lead to cannibalization of sales of one of the programs, on the basis of Key Opinion Leaders' views. Such potential cannibalization, and thus not the clinical successfulness, would remove innovation incentives.[102] Following, both patients and healthcare providers would encounter negative effects from the reduction of innovation incentives as it would reduce the amount of products developed on the relevant market, leading to higher prices and less access to products

[93] *Medtronic/Covidien* [2014] (n. 72), para. 231, 243-249.
[94] Ibid, para. 247.
[95] *Novartis/GlaxoSmithKline Oncology Business* (COMP/M.7275) [2015] L-2985, para. 12.
[96] Ibid.
[97] Ibid, para. 13.
[98] Ibid, para. 89.
[99] Ibid, para. 161.
[100] Ibid, para. 78.
[101] Ibid, para. 102-104, 161.
[102] Ibid, para. 104-109.

better suited to medical needs.[103] In addition, the EC held that the merger could significantly reduce the merged entity's incentives to develop broader clinical research programs for other types of cancer, for which the parties were conducting earlier stage clinical trials at the time of the merger.[104] Remarkably the EC thus developed a new practice looking beyond phase III clinical trials, as it addressed GSK's and Novartis's other on-going Phase I and II clinical trials for the use of MEK and B-Raf inhibitors for a number of other types of cancer.[105] Such practice constitutes a deviation from earlier decisional practice, in which the EC considered that only phase III pipeline products were in a sufficiently advanced stage of development to be considered a possible competitive constraint.[106]

It is noteworthy that the parties' pipeline products only overlapped for a limited number of cancers and that no extensive assessment of other competitors' B-Raf and MEK early phase trials took place.[107] It appears that the EC merely considered the post-merger elimination of one out of two main research programmes for each product, thereby reducing innovation and hindering competition. Such approach leaves the impression that the *significant impediment to effective competition*-test becomes a more *general impediment to innovation*-test. *Innovation*, because the competitive harm is based on reduced innovation and *general* because the EC did not consider inhibitors of other less dominant market players. Additionally, it may be questioned whether the assessment of early-phase pipeline products verges upon the boundaries of a speculative assessment. By emphasizing the decisive role of cannibalization, rather than the successfulness of clinical trials, the EC attempted to avoid a presumption of successfulness of the clinical trials. Yet, *de facto*, the EC must have assumed that the pipeline products would be launched to the market, since there could be no cannibalization otherwise. That is remarkable since the success rate of phase I clinical trials is only 10%, of phase II clinical trials only 30% and of phase III clinical trials 50%, implying that it is far from certain that the product would eventually be launched on the market.[108] Indirectly, the EC thus largely depended on the presumed successfulness of the pipeline product, in line with Key Opinion Leaders' views.

[103] Ibid, para. 110.
[104] Ibid, para. 112-113.
[105] Ibid, para. 84.
[106] See for example *Novartis/Alcon* (COMP/M.5778) [2010] L-2985, para. 111.
[107] There was for example no overlap concerning the treatment of leukaemia, see *Novartis/GlaxoSmithKline Oncology Business* [2015] (n. 95), para. 186, 193; See for a list of other businesses' early phase trials at the time footnote nr. 34 of *Novartis/GlaxoSmithKline Oncology Business* [2015] (n. 95).
[108] See for example *Glaxo Wellcome/SmithKline Beecham* (COMP/M.1846) [2000] L-2985, para. 70.

(iii) *Pfizer/Hospira*

The EC approved the acquisition of Hospira by Pfizer after Pfizer committed to divest its pipeline biosimilar drug *infliximab*, following an overlap with an already approved and marketed biosimilar. The marketed biosimilar is developed and marketed by Celltrion under the name *Remsima.* Hospira co-exclusively markets *Remsima* under the name *Inflectra* on the basis of a marketing authorisation, so that Celltrion could benefit from Hospira's reputation on the market.[109] As *Inflectra* is the exact same product as *Remsima*, strong price competition existed between Hospira and Celltrion.[110] The only other firm with phase III clinical trials with an *infliximab* biosimilar was Samsung Bioepis.[111] Accordingly, the only three differentiated pre-merger biosimilar products are those from Hospira/Celltrion, Samsung Bioepis and Pfizer.[112]

The EC did not assess the biosimilar's potential commercial success,[113] because of the limited clinical evidence of Pfizer's biosimilar available at the time of the decision.[114] Yet, the EC perceived Hospira and Pfizer as strong players in the biosimilar market based on their reputation, as identified by Key Opinion Leaders.[115] Also customers perceived Pfizer as a strong potential competitor, which was confirmed by Pfizer's internal documents.[116] Following, the merger would have reduced differentiated biosimilar products from three to two, decreasing innovation incentives on two alternative grounds.[117] First, the merger could reduce Pfizer's incentive to continue developing its pipeline product. The EC seems to have come to that conclusion on the sole basis of competitors' opinions indicating that 'a biosimilar company does not have any incentive to pursue the development of a pipeline biosimilar if it already markets a biosimilar for the same molecule'.[118] If that statement would be true, Pfizer would indeed quit developing its own pipeline product after acquiring Hospira, thereby eliminating an important future competitor. Second, and thus alternatively, the EC held that the merger could eliminate the intense price competition between Celltrion and Hospira if Pfizer would hand back Hospira's *Inflectra*

[109] *Pfizer/Hospira* (COMP/M.7559) [2015] L-2985.
[110] Ibid, para. 44.
[111] Ibid, para. 50, 51.
[112] Ibid, para. 45, 61.
[113] Ibid, para. 46.
[114] Ibid, para. 48.
[115] Ibid, para. 47.
[116] Ibid, para. 48.
[117] Ibid, para. 45, 61.
[118] Ibid, para. 60.

rights to Celtrion.[119] Either way, the merger would be likely to significantly impede effective competition.[120]

On the basis of this analysis, the EC first assessed the scenario in which Pfizer would either quit developing its own pipeline product and second, the scenario in which Pfizer would hand back Hospira's *Inflectra* rights to Celltrion. It is unclear why the EC did not elaborate on the scenario in which Pfizer would have both continued to develop its own pipeline product, while at the same time keeping the rights to *Inflectra*. Such scenario would be possible if no special agreement, like a change of control clause, was concluded between Hospira and Celltrion. Accordingly, Pfizer could even have used *Inflectra*-data to improve its own pipeline product. The EC its decision remains silent on the existence of such a clause, which leaves the impression that it drew its conclusions on the sole basis of Key Opinion Leaders' views on innovation incentives. Especially in light of the far-going divestment remedy, that would be rather adverse.

(iv) *General Electric/Alstom*

Following an in-depth investigation, the EC cleared General Electric's acquisition of Alstom upon Alstom's commitment to divest its heavy-duty gas turbines (HDGT) business. The divestment included all resources, personnel and assets,[121] coming down to all customers, capabilities and information required to carry out servicing and innovation on an on-going basis.[122] Alstom had not only a higher R&D spend, but also higher capabilities than its market shares would suggest, placing it in the top three HDGT competitors.[123] Additionally, it had good testing facilities and a large installed base supporting its ability to innovate.[124] Several of Alstom's important pipeline HDGT products, would be discontinued after the merger.[125] Because the HDGT industry is R&D and capital intensive, the procedure to launch new products on the market is costly and lengthy, requiring extensive R&D investments, leading to high market entry barriers.[126] If consequently one of four full-technology companies able to produce HDGT would be removed from the market, the overall competitive pressure on the

[119] Ibid, para. 57-60.
[120] Ibid, para. 61.
[121] *General Electric/Alstom (Thermal Power-Renewable Power & Grid Business)* (COMP/M.7278) [2015] L-2985, para. 1939.
[122] Ibid, para. 1944.
[123] Ibid, para. 965-968.
[124] Ibid, para. 969-982.
[125] Ibid, para. 985-991, 1001, 1073.
[126] Ibid, para. 993-995.

remaining market players would decrease. Following, innovation incentives would diminish.[127] That would not only negatively impact innovation, but also increase prices and decrease consumer choice.[128] Market participants shared this concern. They perceived Alstom as an important innovator with distinctive technologies, who induced other market participants to innovate. A decrease of Alstom's innovation incentives would therefore discourage those market participants to innovate,[129] negatively impacting overall innovation in the HDGT sector.[130] Following this reasoning, the EC decided that the merger would lead to a 'significant and lasting harm to innovation' without the commitments.[131]

(b) Non-Horizontal Mergers

A non-horizontal merger can lead to foreclosure when actual or potential rivals' access to supplies or markets is hindered as a result of a merger, which would reduce those rivals' abilities and incentives to compete.[132] The merged entity might accordingly be put in a position in which it can increase prices, thereby foreclosing rivals in an anticompetitive manner.[133] To assess the likelihood of such anticompetitive foreclosure, the EC examines whether the merged entity would have the ability to foreclose access to input, whether it would have an incentive to do so and whether such foreclosure would have a significant detrimental effect on competition downstream.[134] In this section, some of the vertical cases in which innovation aspects played a role are addressed.

(i) *Intel/McAfee*

The EC approved the acquisition of McAfee by Intel after Intel committed to grant third party vendors of endpoint security systems access to instruction, interoperability and optimization information to enable them to use Intel's functionality when developing their software; to not actively impede competitors' security solutions from running on its chips; and to not impede the operation of its security systems when running on

[127] Ibid, para. 999.
[128] Ibid, para. 996-1000, 1077-1078.
[129] Ibid, para. 959-964.
[130] Ibid, para. 957.
[131] Ibid, para. 996-1000, 1030, 1077, 1079.
[132] Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2008/C 265/07), para. 31.
[133] Ibid.
[134] Ibid, para. 32.

personal computers containing systems sold by vendors other than Intel.[135] The commitments also featured an effective monitoring system and fast-track dispute settlement mechanism with arbitration to solve any disputes.[136] By allowing tighter integration of chips with its security software, Intel preserved potential post-merger innovation benefits.[137] The behavioural commitments last for a period of time, which seem to be in line with the characteristics of the endpoint security market that is globally driven by rapid innovation.[138] The remedy constituted an interoperability guarantee, i.e. the possibility for software and hardware to interact,[139] because of the EC's concerns that Intel would have post-merger opportunities and incentives to prevent endpoint security systems competing with McAfee from running on its dominant central processing units and chipsets.[140] If these effects were to materialize, Intel's dominant position would be strengthened, McAfee's competitors would be foreclosed and barriers to entry would increase, ultimately decreasing innovation and consumer choice.[141]

(ii) *ARM/Giesecke & Devrient/Gemalto Joint Venture*

The EC approved the creation of a joint venture (hereafter "JV") between a UK semiconductor intellectual property supplier, ARM and two providers of security solutions, Giesecke & Devrient from Germany and Gemalto from the Netherlands. The JV was created to develop trusted execution environments (TEE) offering security services for applications for consumer electronic devices. Despite the fact that its creation would not remove actual or potential competitors from the market, the EC raised foreclosure concerns.[142] The existence of those competitors was conditional upon their ability to develop solutions running on ARM's technology.[143] ARM's strong upstream market position as a supplier of application processors for consumer electronic devices, could incentivize ARM to leverage its market position by favouring the JV over its competing TEE providers.[144]

[135] *Intel/McAfee* (COMP/M.5984) [2011] L-2985, see section B, nr. 3 of the commitments on p. 63.
[136] Ibid, see section D, F of the commitments on p. 69, 71.
[137] Competition Directorate-General of the European Commission (n. 35), p. 6.
[138] *Intel/McAfee* [2011] (n. 135), para. 109.
[139] Ibid, para. 128.
[140] Ibid, para. 173.
[141] Ibid, para. 167, 168, 172, 174.
[142] *ARM/Giesecke & Devrient/Gemalto Joint Venture* (COMP/M.6564) [2012] L-2985, para. 78, 87-88, 93.
[143] Ibid, para. 96.
[144] Ibid, para. 170.

If such foreclosure would manifest itself, competitors would be hindered in developing and launching competing TEEs interoperable with ARM's technology,[145] because they would need access to relevant technical specifications of ARM's TEE at the same time as the JV to be able to innovate and compete.[146] Accordingly, the JV's customers would face less choice, higher prices and possibly less innovative products.[147] ARM therefore committed to give its competitors the necessary hardware information to alternative TEE solutions on the same conditions as the JV for 8 years.[148]

(iii) *Liberty Global/Ziggo*

The EC accepted the commitments of Liberty Global after an in-depth investigation, approving the acquisition of Ziggo, a Dutch cable TV operator, by Liberty Global. The transaction combined the first and second largest cable TV network in the Netherlands.[149] Even though both entities operated in different Dutch geographic areas,[150] the EC found that Liberty Global would own the only two post-merger linear Premium Pay TV film channels in the Netherlands, enabling it to increase those channels' wholesale prices for retail operators.[151]

The Dutch Pay TV market is characterized by agreements restricting TV broadcasters to offer their TV channels and associated content over the Internet. The EC's concerns focussed on the increased post-merger incentives to conclude restrictive agreements, depriving consumers from innovations in the way they can watch TV online,[152] also known as *over-the-top* (OTT) internet-based services.[153] If the OTT offerings would become successful, consumers would face an increased choice between cable TV subscriptions on the one hand and online content on the other hand.[154] The merger would however increase Liberty Global's buying power vis-à-vis TV channel broadcasts, thereby reducing broadcasters' ability to launch OTT services over the Internet and affecting innovation in the delivery of those services.[155] Because

[145] Ibid, para. 155, 177.
[146] Ibid, para. 79.
[147] Ibid, para. 177.
[148] Ibid, para. 212.
[149] *Liberty Global/Ziggo* (COMP/M.7000) [2014] L-2985, para. 248.
[150] Ibid, para. 459.
[151] Ibid, para. 199.
[152] Ibid, para. 572.
[153] Ibid, para. 301.
[154] Ibid.
[155] Ibid, para. 361, 365, 394, 396.

this would prevent, delay or hamper OTT innovation,[156] the merger was likely to lead to a significant impediment to effective competition.[157] More concrete, there would be a significant post-merger impediment to effective competition in the upstream market for the wholesale supply and acquisition of Premium Pay TV channels and the downstream market for the retail supply of multiple pay services in the Netherlands.[158] Liberty Global therefore committed to divest its premium pay TV channel Film1,[159] including all tangible and intangible assets, licences, permits, authorisations, contracts, leases and personnel.[160] It also committed to not contractually limit its rivals' OTT services.[161] The merged entity could restrict TV broadcasters' ability to distribute via OTT services in its capacity as an Internet network provider.[162] Liberty Global therefore also committed to ensure effectiveness of the OTT content distribution by maintaining sufficient interconnection capacity for parties willing to distribute data to its broadband customers, by ensuring at least three uncongested routes into the merged entity's IP network in the Netherlands.[163]

(iv) *Hutchison/Telefonica UK*

The EC prohibited Hutchison's proposed acquisition of Telefónica UK after an in-depth investigation. The merger would create a new market leader in the UK mobile market and significantly increase the merged entity's revenues and customer base, leaving only two competing mobile network operators (MNOs) on the market.[164] Accordingly, the merged entity would be less inclined to offer lower prices aimed at attracting new customers and thus be less inclined to compete.[165] In light of those concerns, the EC investigated whether non-mobile network operators (non-MNOs), who do not own their own network and therefore conclude network sharing agreements with MNO's, are able to compete on the same level as MNOs. The EC concluded this was not the case, as non-MNO are strongly dependent on the (quality of the) MNO's mobile networks.[166] Accordingly, MNO's decisions greatly influence the performance of mobile services,[167]

[156] Ibid, para. 317.
[157] Ibid, para. 201.
[158] Ibid, para. 247.
[159] Ibid, para 559, 560, commitments, section B, para. 1.
[160] Ibid, commitments, section B, para. 5.
[161] Ibid, para. 579, commitments, section F, para. 46-48.
[162] Ibid, para. 585.
[163] Ibid, para. 586.
[164] *Hutchison/Telefonica UK* (COMP/M.7612) [2016] L-2985, para. 878, 880
[165] Ibid, para. 881, 885-887.
[166] Ibid, para. 1080-1106.
[167] Ibid, para. 1087

so that competition among MNOs remains key to many aspects of the quality of mobile services.[168] Since non-MNOs are thus unable to innovate like MNOs,[169] non-MNOs are unable to outweigh the post-merger competitive pressure loss.[170] On the contrary, the transaction would reduce the already limited ability of non-MNOs to compete even more.[171] Also, an increased level of post-merger wholesale rates would negatively impact non-MNO downstream businesses growth, so that the development of new and innovative non-MNO business models would be hindered.[172] Accordingly, the EC concluded that the reduced number of MNOs and the competition decrease would lead to higher prices,[173] reduced consumer choice and quality,[174] weakened development of future network infrastructure,[175] such as 5G,[176] and less MNOs willing to host non-MNOs.[177] The offered commitments, among which the non-MNOs hosting on the merged entity's network, were not sufficient to outbalance such anti-competitive effects, as the non-MNOs would remain commercially and technically dependent on the merged entity.[178]

(v) Pending Decisions

The EC conditionally approved the merger between Dow and DuPont, both US based chemical companies, subject to the divestment of a significant part of DuPont's pesticide business: its herbicides and insecticides business, including all tangible and intangible assets and relevant personnel, as well as large parts of its global R&D organisation.[179] The EC's assessment focussed on the reduced competition among certain petrochemical products, the reduced competition in a number of markets for existing pesticides and the significant reduction of innovation competition for pesticides by removing the merged entity's incentives 1) to continue pursuing parallel innovation and 2) to develop and market new pesticides.[180] Concerning the former, the EC addressed that both parties were competing by innovating in parallel pipelines, which

[168] Ibid, para. 1089.
[169] Ibid.
[170] Ibid, para. 1189.
[171] Ibid, para. 885.
[172] Ibid, para. 2306.
[173] Ibid, para. 1125.
[174] Ibid, para. 2312.
[175] Ibid, para. 2308.
[176] Ibid, para. 2177.
[177] Ibid, para. 2261, 2266, 2302.
[178] Ibid, para. 2757, 3076.
[179] Note that the decision is not yet published; European Commission, 'Mergers: Commission clears merger between Dow and DuPont, subject to conditions' (IP/17/772), Brussels: 27 March 2017.
[180] Ibid

would be discontinued after the merger.[181] Concerning the latter, the EC found that the merged entity's incentive and ability to innovate would be smaller than both parties separately, as it was expected to cut back on R&D spend to develop new products.[182] This is remarkable because the assessment did not concern a specific (pipeline) product. The EC figured that in light of the entire R&D process from discovery to manufacture and sale of new products, only three global players would remain to compete with the merged entity in an industry with high entry barriers.[183] In light of the heavy weight attributed to the innovation assessment in the EC's *Dow/DuPont* merger decision, it is to be expected that similar attention shall be paid to innovation effects in the pending *Bayer/Monsanto* decision, covering a similar industry.[184]

3.1.2. Remedies

As previously illustrated, remedies aim at ensuring competitive market structures, so that mergers do not significantly impede effective competition.[185] Commitments must therefore reduce all competition concerns below the threshold of 'significant' and be capable of being implemented effectively within a short period of time.[186] Structural remedies durably prevent competition concerns without requiring continued monitoring and are accordingly preferred by the EC.[187] Yet, behavioural remedies can also be suitable when they equalize the effects of structural remedies.[188] This section assesses adequate remedies for mergers in light innovation effects.

(a) Structural Remedies

It is inherently difficult to predict future innovation effects. Even more when product (markets) are yet to be developed. Even in the pharmaceutical sector where measuring development is less complex following the differentiation between clinical trials' phases, the effects of pipeline products on future competition and innovation remain difficult to assess. Remarkably, intrusive remedies like divestment of an overlapping

[181] Ibid.
[182] Ibid.
[183] Ibid.
[184] *Bayer/Monsanto* (COMP/M.8084) [no decision taken yet].
[185] *Liberty Global/Ziggo* [2014] (n. 149), para. 530.
[186] Ibid.
[187] Ibid.
[188] Ibid, para. 530, 571.

(pipeline) business are often deemed necessary in light of follow-on innovation, despite the uncertainties of a pipeline product's effects on innovation and potential competition. Take for example the divestment of Covidien's phase III pipeline product *Stellarex.* The divestment covered everything necessary to develop and manufacture *Stellarex* and to ensure its viability and competitiveness,[189] among which all (in)tangible assets, licenses, permits, contracts, leases, customer orders and personnel.[190] Also Pfizer's divestment of *infliximab* included everything necessary to conduct and complete phase III clinical trials, next to reasonable support when requesting marketing authorisation upon the product's successfulness.[191] The divestment in *Novartis/GSK* was even more intrusive. The competition concerns focussing on two overlapping pipeline products were only diminished by divesting all patent rights, know-how, rights to conduct clinical trials, databases, regulatory filings, employees and third-party agreements, in combination with the behavioural remedy of continued co-financing of clinical trials for a transition period.[192]

All these decisions concerned the assessment of innovation effects and (potential) competition. To give more strength to its decisions, the EC paid much attention to Key Opinion Leaders' views, like it did to market participants' considerations in *General Electric/Alstom*.[193] These considerations evidently had to be taken into account when assessing possible future effects, but in light of the intrusive remedies, one may wonder whether such intrusive measures are best fit for purpose looking at the uncertainty that characterizes innovation.[194] Perhaps, the EC could take such uncertainties more into account when assessing commitments, so that merging parties would be more inclined to propose less intrusive remedies like licensing and other behavioural commitments.[195] Interestingly, the *Intel/Altera* merger, which was not

[189] *Medtronic/Covidien* [2014] (n. 72), para. 394, 408.
[190] Ibid, para. 394.
[191] *Pfizer/Hospira,* [2015] (n. 109), para. 310, 316.
[192] *Novartis/GlaxoSmithKline Oncology Business* [2015] (n. 95), para. 278.
[193] *General Electric/Alstom (Thermal Power-Renewable Power & Grid Business)* [2015] (n. 121), para. 955-964, 999.
[194] Not the EC, but parties themselves initiate commitments, like divestment. Yet, these are often anticipated by their expectations of what the EC might require following pre-merger talks. As a consequence thereof, one may encounter more hybrid solutions in which parties determine possible buyers during EC investigations, while concluding a formal divestment agreement upon clearance of the merger. By searching for potential purchasers ahead of any remedy, parties anticipate the outcome of the EC and facilitate the decision making process. This is often a strategic choice that may depend more on parties' shareholders' position or the firm's reputation, rather than on their interest of keeping the pipeline product within the business.
[195] It is noteworthy that future market conditions are by their very nature uncertain in light of the perhaps limited successfulness of pipeline products. This means that the divestment would not have been required from an ex-post perspective when the product proves unsuccessful and will never be launched. In this context, an analogy can be drawn with a recent decision of the Dutch national competition authority, in which the structural remedy entailing the termination of a partner relationship was withdrawn after showing that market conditions had

extensively discussed, was unconditionally cleared because the EC found that sufficient alternative interconnect technologies existed at the time of the merger, in the form of license agreements and offers to license.[196]

(b) Behavioural Remedies

A common behavioural remedy is the licensing of IP rights, albeit with a royalty payment,[197] on fair, reasonable and non-discriminatory terms, also known as FRAND terms.[198] Alternatively, IP rights can also be divested to an independent body or parties can commit to implement a certain protocol on existing and/or future products.[199] Interoperability can be guaranteed through these behavioural commitments. Even though these commitments are not as intrusive as divestment, they can still strongly affect undertakings' freedom to contract.[200] Intel for instance committed 1) to not actively impede competitors' security solutions from running on its chips; 2) to refrain from impeding the operation of its security systems when running on personal computers containing systems sold by vendors other than Intel; and 3) to grant its competitors access to its information on instructions, interoperability and optimization, enabling them to use its functionality when developing software.[201] Similar commitments, combined with an effective monitoring system and fast-track dispute settlement mechanism,[202] were also part of remedies in *ARM/Giesecke & Devrient/Gemalto JV.*[203] In *Novartis/GSK*, the commitment even entailed the continued co-financing of clinical trials for a transition period.[204] The EC figured that such remedies would preserve potential innovation after the merger,[205] regardless of the severe limitations that they might have on the manner in which parties can conduct their businesses. Accordingly, such commitments might not only negatively affect the merged entity its return on investment and thereby its innovation incentives, but also

changed. Possibly, the unsuccessfulness of a pipeline product also triggers the change of market conditions, so that hypothetically, similar cases could be initiated in the future. Nevertheless, in that event, it may not be overlooked that even though ex-post market conditions illustrate divestment would not have been necessary, there could still have been an impact on other parties' incentives to innovate, thereby harming innovation competition. Less intrusive behavioural remedies, such as licensing, could accordingly prove adequate solutions to such issues; See: Dutch Competition Authority, decision ACM/DM/2016/207440_OV in case 16.0942.99 [2001], concerning the request to adapt its decision of 13 June 2016 in case 15.0849.24/*Brocacef-Mediq.*

[196] *Intel/Altera* (COMP/M.7688) [2015] L-2985, para. 136, 144, 151.
[197] Kartner (n. 22), p. 300.
[198] *Intel/Altera* [2015] (n. 196), para. 125.
[199] Kartner (n. 22), p. 300.
[200] Ibid.
[201] *Intel/McAfee* [2011] (n. 135), see section B, nr. 3 of the commitments on p. 63.
[202] Ibid, see section D, F of the commitments on p. 69, 71.
[203] *ARM/Giesecke & Devrient/Gemalto Joint Venture* [2012] (n. 142), para. 210-238.
[204] *Novartis/GlaxoSmithKline Oncology Business* [2015] (n. 95), para. 278.
[205] Competition Directorate-General of the European Commission (n. 35), p. 6.

competitors' innovation incentives following a free-riding phenomenon.[206] The EC should thus carefully assess whether the measure is necessary to achieve the envisaged goal on a case-by-case basis to prevent over-enforcement, ultimately leading to less innovation.[207]

(c) Comments

Remedies always need to be proportionate in light of the stakes at risk. Over-enforcement should be avoided as all times, as it leaves remedies counter-productive by leading to less innovation. The EC should accordingly strike a balance so that both the merged entity and its rivals have a maximum of incentives to invest and innovate.[208] This balance can be found in both structural and behavioural remedies, as long as they remain proportionate.

Fay Kartner noticed a differentiation between certain types of remedies for certain sectors.[209] She concludes that interoperability is a common remedy in network sectors, access to information in ICT sectors and divesture in the pharmaceutical sector.[210] According to Kartner, the EC differentiates its remedies between the various sectors.[211] Although each sector has its own characteristics, one should be careful with such differentiation. Divestment has for example manifested itself in both agro-chemical industries and pharma industries. Also licensing can be an adequate remedy in many different sectors. Lastly, a combination of structural and behavioural remedies cannot be excluded, as illustrated by *Novartis/GSK*.

3.2. A New Theory of Harm?

Generally, the EC already recognized possible negative effects on innovation in 2004 when the HMG were created. Section 8 of the HMG expletively recognizes diminished innovation as a theory of harm. The same is entailed in section 10 of the NHMG, created in 2008. 'Diminished innovation' as a theory of harm is therefore not new. It only recently manifested itself. For horizontal mergers, the EC is mainly concerned

[206] Kartner (n. 22), p. 306.
[207] Ibid, p. 318-319.
[208] Ibid, p. 318.
[209] Ibid.
[210] Ibid, p. 318-319.
[211] Ibid, p. 318.

about decreased investments and the fact that pipeline products that might have competed without the merger will not enter the market. In non-horizontal mergers, the main concern is that foreclosure might reduce innovation incentives.

A merger's effects on innovation can vary significantly.[212] There can be effects on competition in innovation when the merged entity would have obtained assets allowing it to develop new products, or innovation can comprise markets in themselves so that the improvement of products result in new product markets.[213] On the basis of the previous decisions, one may conclude that the 'significant impediment to effective competition'-test still applies, the significant impediment being innovation losses. Looking at the EC's decisional practice, three different manifestations of such significant impediment seem to exist: (a) the merger eliminates a competitor in a future market, (b) the merger leads to the suspension of investments in a pipeline or (un)identified product and (c) the merger enables foreclosure on an upstream or downstream market. Each of these was manifested in multiple EC merger decisions.

3.2.1 Elimination of a Competitor in a Future Market

Merging parties may exert a significant constraint on each other in a future market. When a merger between those parties removes such constraint, innovation will decrease when insufficient actual or potential competitors remain. This was the case in *Medtronic/Covidien,* where the EC applied a so-called 'test of elimination of future competition'. In application of this test, the EC assessed whether the pipeline product, which is a source of potential competition in an existing or future product market,[214] would fail to compete with existing products. Such failure would be caused by a post-merger innovation stop following which the product would not be launched on the market. If answered positively, effective competition would be impeded.

3.2.2. Suspension of Investments in a Pipeline or (Un)identified Product

[212] Ibid, p. 301.
[213] Ibid, p. 301.
[214] Gyselen (n. 52), p. 48.

The EC considered that a pipeline product's market removal could decrease innovation incentives, harming innovation. With a result of higher prices and less consumer choice, the decrease of innovation incentives would harm effective competition. This reasoning was applied in *Medtronic/Covidien, Pfizer/Hospira* and *GE/Alstom,* where an overlap existed between an existing and a pipeline product. In *GE/Alstom,* the EC held that the merger would lead to a 'significant and lasting harm to innovation' without the commitments.[215] A different, yet related approach is found in *Novartis/GSK* concerning the overlap of two pipeline products. The EC considered that innovation incentives were based on generating future sales. When the sales of one product would potentially cannibalize the sales of another product, innovation incentives for one of both pipeline products would decrease. Those diminished innovation incentives could hinder competition. In light of the uncertainties of comparing two pipeline products and the absence of an explicit reference to a 'significant impediment to effective competition', one may question whether a *significant* impediment to competition was established. The EC possibly opened a door to a new qualification standard for 'significant impediments to effective competition', i.e. a 'general harm to innovation' rather than a qualification on the basis of a 'significant and lasting harm to innovation'. In light of the lack of an in-depth investigation in this decision, there might even be a presumed impediment to effective competition, which would severely risk over-enforcement. Accordingly, the EU merger regulation's reach would be extended to any transaction leading to a 'general reduction' of innovation in a certain industry. Also noteworthy, is that the EC seems to extend this approach to non-product specific innovation competition.[216] In *Dow/Dupont* the EC was concerned that the merger would combine two of a very limited number of undertakings that could develop new products in a specific field. Though the decision has not yet been published, the theory of harm seems to extend to unidentified future products. This implies that the EC would test whether mergers (i) involving important innovators, (ii) in a concentrated industry with high market entry barriers, (iii) with no innovations from other companies, (iv) are likely to decrease innovative efforts and if so, would reduce the number and quality of new products,[217] regardless whether or not those products can be identified at the time of

[215] *General Electric/Alstom (Thermal Power-Renewable Power & Grid Business)* [2015] (n. 121), para. 996-1000, 1077, 1030, 1079.
[216] Gavin Bushell, 'EU Merger Control and the Innovation Theory of Harm: Fake News?', *Kluwer Competition Law Blog* (3 March 2017). Retrieved from: http://competitionlawblog.kluwercompetitionlaw.com/2017/03/03/eu-merger-control-and-the-innovation-theory-of-harm-fake-news/ last visited on 25 July 2017.
[217] Ibid.

the merger. This would create a presumption of anti-competitiveness for any R&D merger,[218] against which parties would have a hard time arguing efficiencies.

3.2.3. Foreclosure on an Upstream or Downstream Market

Foreclosure on an upstream or downstream market can hinder third parties' innovation incentives. This manifestation of the theory of harm is particularly applicable to non-horizontal mergers. It features harming innovation incentives by preventing interoperability, as in *Intel/McAfee* and *ARM/Giesecke & Devrient/Gemalto Joint Ventur,* and preventing access to networks, as in *Liberty Global/Ziggo.* A crucial determinant in assessing competitive harm following foreclosure is the analysis of existing alternatives, as in *Hutchison/Telefonica UK.*

3.2.4. Comments

The theory of harm grants the EC the opportunity to look beyond market shares and overlapping products, but is characterized by uncertainties. It is not based on economic analysis and no explicit balancing test between cannibalization and appropriability is applied. Moreover, the application of the theory of harm to early phase pipeline products possibly conflicts with section 74 of the HMG, referring to a two-year future market entry standard. In light of those uncertainties and Commissioner Vestager's confirmation that the EC will continue to assess innovation effects,[219] the creation of a more specific legal framework would not be misplaced. A review of the merger control rules has been scheduled, but unfortunately barely any attention was paid to the importance of innovation effects.[220]

It is worth considering moving the in-depth analysis of innovation effects to phase 1 mergers, instead of postponing such assessment to phase 2 when the EC has

[218] Ibid.
[219] See Margrethe Vestager, 'The State of the Union: Antitrust in the EU in 2015-2016', speech at Annual Concurrences Paris Conference. Paris: 15 June 2015. Retrieved from https://ec.europa.eu/commission/commissioners/2014-2019/vestager/announcements/state-union-antitrust-eu-2015-2016_en last visited on 25 July 2017: 'will continue to analyse likely price effects, […]. But not only price effects, […] also […] what will happen to innovation.'.
[220] European Commission, *Towards more effective EU merger control* (COM(2014)449 final) [White paper]. Brussels: 9 July 2014, para. 14.

serious doubts that the merger will lead to a significant impediment to effective competition.[221] The rationale is 1) that a more thorough assessment would be better placed in phase 1 in light of intrusive remedies, 2) that the EC accepts negative innovation effects rather easily in phase 1 mergers, and 3) that only about 5% of cases go into a phase 2 merger assessment.[222] This would create a fairer balance between the high burden for parties to illustrate efficiencies and the low burden for the EC to accept a possible negative effect on innovation. Even if a more in-depth analysis already takes place behind closed doors in the negotiation phase, it is recommended to move the analysis to phase 1 to increase transparency and legal certainty.

3.3. Assessment of Positive Effects

The assessment of so-called efficiencies is conducted when parties claim positive effects of the merger. They can for example claim that the rationale for the merger is to increase innovation by combining R&D programs, which increases their resources in comparison to when they would remain independent. Even though the Merger Regulation allows the EC to take into account such efficiencies,[223] positive innovation effects are only assessed when claimed by merging parties.[224] In order to benefit from the efficiency defence, parties should illustrate that the merger will bring about a benefit for consumers, that it is verifiable and merger specific.[225] More concretely, the merger may not worsen consumers' position.[226] The efficiencies should be a direct consequence of the merger and may not be achieved to a similar extent by other less anti-competitive alternatives.[227] Moreover, the efficiencies need to be verifiable for the EC to check whether they are likely to materialise and sufficiently substantial to counteract the merger's anti-competitive effects.[228]

[221] Regulation (EC) 139/2004, Article 6(1)(b).
[222] Reinhilde Veugelers, 'Innovation in EU Merger Control: Walking the talk', Bruegel Policy Contribution 708 (2012). Retrieved from: http://bruegel.org/wp-content/uploads/imported/publications/pc_2012_04__FINAL.pdf.
[223] Regulation (EC) 139/2004, preamble n. 29.
[224] Veugelers (n. 222).
[225] Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2004/C 31/03), para. 78.
[226] Ibid, para. 79.
[227] Ibid, para. 85.
[228] Ibid, para. 86.

This evidentiary burden is difficult to meet, as illustrated by the fact that efficiencies have never been decisive in EC decisions.[229] Even though Johannes Laitenberger, Director-General of DG Competition, stated that the reason why there have been so little successful efficiency defences is rather simple: 'When companies have a strong efficiency defence, we don't run the antitrust cases in the first place.',[230] this might still be worrying as it possibly implies that the EC considers efficiencies not to be sufficiently important to let it influence its decisions. After all, efficiencies are in the first place a legal defence that parties should be able to invoke. It does not have the primary function to serve as a filter for assessing mergers.

In combination with the burden of proof on notifying parties, it is perhaps time to introduce a better balance between the willingness to seriously assess efficiency considerations raised by parties on the one hand and taking the burden of proof to assess such considerations on the other hand. This would be fairer in light of the heavy evidentiary burden that parties invoking efficiencies encounter in relation to the low evidentiary burden the EC carries when assessing negative effects of a merger.

4. Consequences for Merging Parties

There are negative consequences for merging parties following the legal uncertainty characterizing the EC's innovation effects assessment. These are especially interesting from a business consultancy perspective, but also illustrate that parties should approach mergers in innovation-related industries in a distinct manner as long as there are no clear best practices or guidelines in a legal framework. Legal advisors should therefore take the following into account.

Before the notification process, it is advisable that parties conduct strategic deal planning with special attention to innovation. Parties should consider efficiencies in light of the evidentiary burden and provide sufficient evidence accordingly. Perhaps not only structural remedies, like divestment, but also behavioural remedies such as licensing should be considered. The combined focus on efficiencies and licensing might constitute a less intrusive measure then divestment, which could be beneficial

[229] Veugelers (n. 222).
[230] Laitenberger (n. 1).

for the undertakings seeking merger clearance. Ultimately, if a merger is adequately anticipated, maybe no remedies will be required at all. This was illustrated by the *Intel/Altera* merger, which the EC unconditionally cleared as it considered license agreements and offers to license already to exist, so that sufficient alternative interconnect technologies were present.[231] Accordingly, the facilitation of licensing agreements before merger application can assist in avoiding a complex merger clearance procedure. If divestment would be necessary anyway, it is advisable that parties search for upfront buyers so that they anticipate the outcome of the investigation and search for potential purchasers ahead of remedies.

From a procedural perspective, parties should not be surprised by a lengthy and costly pre-notification procedure. Strategic deal planning and a focus on innovation and efficiencies possibly require a more lengthy procedure due to the required disclosure of multiple files and their analysis accordingly. Parties should therefore prepare as much data and documents as possible in relation to innovation to secure a smooth pre-notification process. Such data should, advisably, consist out of both internal and external documentation addressing R&D input and output, patents, business plans and perhaps even some financial or market analysis underlying its business plans in light of the ambiguous link between concentration and innovation. Shortly said, all data that could assist in measuring the innovative activity of the firm and its future innovative prospects can facilitate the process. By preparing such data, parties would supplement the EC's task in searching for the connection between competition and the merger's innovation effects. Such preparation will not only facilitate the EC's investigation, but can also be beneficial for the merging entities as the EC might be more reluctant to look at behavioural remedies when it has sufficient background information.

5. Best Practices

The EC is correct in recognizing that there are benefits in having a variety of undertakings investing in R&D separately. However, the advantages of bundling R&D powers should not be overshadowed by those benefits. A merger between parties

[231] *Intel/Altera* [2015] (n. 196), para. 136, 144, 151.

conducting parallel research is not necessarily harmful, as it combines powers and makes room for new R&D investments. An increased emphasis of the EC on innovation efficiencies would therefore be advisable. In the same context, the evidentiary burden of the efficiency defence should perhaps be lowered. Parties invoking the efficiency defence face a high burden of proof when evidencing positive effects on innovation. However, when the EC wants to prevent a merger, they face a rather low burden of proof illustrating negative effects on innovation. In extreme events, such practice could even verge upon speculation. This imbalance can be restored by lowering the evidentiary burden for merging parties, or by making an assessment of efficiencies mandatory for the EC. This is also in line with the EC's assessment of anti-competitive agreements and the abuse of a dominant position. Whenever an anti-competitive agreement is prohibited under Art 101(1) TFEU, it can still be lawful when satisfying the Art 101(3) TFEU conditions. A similar reasoning is found in Art 102 TFEU. Even though a mandatory assessment would be rather burdensome in light of the workload, the merger regulation allows for the EC to take efficiency effects into account as part of its substantive analysis, even when parties did not submit them. Above all, the importance of such efficiencies should not be underestimated as they can counteract anti-competitive effects on innovation created by the merger.[232] Ultimately, it is the EC's task to see whether such anti-competitive effects exist and continue to exist in light of efficiencies. In the same context, the EC's decisional practice has illustrated that the harmful effects on innovation are rather easily accepted in especially phase 1 mergers. To create more legal certainty as to how the EC assesses innovation effects and to guarantee that a more in-depth analysis of the innovation effects takes place in a transparent manner, regardless of the stage of the merger procedure, it is perhaps time to move the in-depth investigation of innovation effects to phase 1. This would achieve a more transparent assessment of innovation effects, rather than an assessment behind closed doors in the pre-negotiation phase. This best practice shall make it increasingly difficult for the EC to accept negative innovation effects in phase 1 mergers, without a transparent in-depth assessment. Following, a presumption of harm to innovation will no longer be sufficient to prohibit a merger.

[232] Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2004/C 31/03), para. 76.

The assessment can be based on Shapiro's principles. By consistently assessing whether the merger would significantly remove competitive pressure (contestability), whether it enables the merged entity to gain extra benefits from its innovation (appropriability) and whether a combination of complementary assets increases innovation capabilities that stimulate innovation, the innovation assessment method would become more consistent, thereby increasing legal certainty. Alternatively or supplementary, a balancing test between post-merger appropriability and cannibalization could be introduced to provide more certainty regarding the assessment method. Also a framework rendering the reporting of efficiency-related data mandatory can be put in place. The form CO should then be updated accordingly to suit the increased disclosure of innovation-related information. Such disclosure shall be more burdensome on merging entities, but will facilitate the EC's assessment and perhaps lead to less intrusive commitments.

These suggested best practices are a first step in the right direction. Ultimately a more concrete legal framework supported by economic analysis should be put in place. It should provide limits to the EC's discretion and make room for a case-by-case assessment in a consistent and transparent manner. Such legal framework would contribute to avoiding over-enforcement, which diminishes incentives to innovate and harms the vitality of industrial development and consumer welfare.

6. Conclusion

Merger control deals with the assessment of future effects. When assessing innovation, there is much uncertainty as to how such effects are to manifest themselves as it often relates to future products, albeit in future markets. This renders the merger assessment of innovation effects as a theory of harm rather complex. Moreover, no clear *innovation* definition has been developed in EU instruments and a legal framework setting the boundaries of how to assess innovation is missing. Since no adequate determinants for innovation and no adequate economic theory establishing a connection between innovation and competition has been developed so far, the EC has an extremely large discretion when assessing innovation effects. Perhaps even to such an extent, that speculation about a merger's innovation effects cannot fully be excluded. This is not only detrimental to legal certainty, but also entails

a large risk of over-enforcement, eventually leading to less innovation and a decrease in social welfare.

Such negative effects can be outbalanced when the EC assesses innovation effects in a consistent and transparent manner, thereby enabling legitimate expectations and increased legal certainty. An analysis of the EC's decisional practice however illustrates that no such consistency exists. Generally, the significant impediment to effective competition test still applies. In light of the innovation theory of harm, such impediment is created by an innovation decrease in three distinctive ways: (i) the elimination of a competitor in a future market, (ii) the suspension of investments in a pipeline or (un)identified product and (iii) the foreclosure on an upstream or downstream market. It remains however uncertain how those effects are to be measured. One may therefore question whether intrusive remedies are fully justified, or whether increased attention to behavioural remedies would be better placed.

The former has consequences for (legal advisors of) merging parties. Merging parties should engage in strategic deal planning and be prepared to submit innovation related documents. A more lengthy merger procedure is to be expected and remedies should be anticipated. Such anticipation by e.g. providing licenses in the pre-notification process or looking for up-front buyers can facilitate the assessment or lead to less intrusive remedies.

The EC can increase to legal certainty by adhering to certain best practices. An increased emphasis on innovation efficiencies is a good starting point. The evidentiary efficiency burden of parties should be lowered and the evidentiary burden of the theory of harm for the EC should be strengthened to restore the balance. This goal can be achieved by adapting the form CO to make efficiency reporting mandatory for merging parties or by subjecting the EC to a mandatory efficiency test. Moreover, practice illustrates that anti-competitive innovation effects are generally easily accepted in phase 1 mergers. A suggestion would therefore be to move the innovation analysis of the pre-merger phase and the in-depth innovation analysis of phase 2 mergers to phase 1, as long as no adequate framework has been developed. Shapiro's principles could be a good basis for such in-depth assessment. Accordingly, the EC should be testing whether the merger would significantly remove competitive pressure (contestability), whether it enables the merged entity to gain extra benefits from its innovation (appropriability) and whether a combination of complementary assets

increases innovation capabilities stimulates innovation. A balancing test between appropriability and cannibalization could further complement such testing.

These best practices do not fully offset the uncertainties that characterize the innovation assessment in EU merger control, but constitute a good starting point to create more legal certainty on how to address innovation and how to proceed in a case-by-case assessment of a mergers' innovation effects. Scholars and economists are called upon to further research the subject, as it will become increasingly relevant in an ever-more developing world and would serve as a good basis to raise awareness for a revised legal framework.

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