INNOVATION COMPETITION IN EU MERGER CONTROL

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"*That's another cook*"- Louis van Gaal

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1. Introduction

"Pesticides are products that matter – to farmers, consumers and the environment. We need effective competition in this sector so companies are pushed to develop products that are ever safer for people and better for the environment. Our decision today ensures that the merger between Dow and DuPont does not reduce price competition for existing pesticides or innovation for safer and better products in the future."[1]

On 27 March 2017 the European Commission ("**Commission**") approved under the EU Merger Regulation[2] ("**EUMR**") the merger between US-based chemical companies Dow and DuPont.[3] The merger was approved on the following condition, the divestiture of major parts of DuPont's global pesticide business, including its global R&D organization. This far-reaching remedy was the result of the Commission's concerns regarding not only current product markets and price competition, but rested heavily on the likely effects of the transaction on innovation competition.

The Commission considered Dow and DuPont both important innovators in discovering and developing new active ingredients ("**AIs**").[4] Presumably, the proposed merger would have had a significant impact on innovation competition by removing the parties' incentives to continue to pursue ongoing parallel innovations efforts in certain innovation spaces and by removing the parties' incentives to develop and bring to the market new pesticides.

In the previous years the Commission has been active in assessing the impact of mergers on innovation with a particularly interventionist approach in the pharmaceutical and high-technology driven industries, in the words of the European Competition Commissioner Vestager: *"That's why, when we look at high-tech mergers, we don't just look at whether they might raise prices. We also assess whether they could be bad for innovation."*[5]

This focus on innovation competition is understandable and desirable. In today's economy, firms do not compete solely on prices, but they also try to gain a competitive advantage by way of innovation. As the main driver of economic growth and one of the key drivers of long-term prosperity, competition law has its role in protecting, and even possibly fostering innovation.[6]

It is however no easy task to truly integrate innovation concerns in the traditional understanding and application of EU competition law, which predominantly focusses on a static analysis of competition. This short-term analysis relies on the structure-conduct-performance paradigm and aims at lower prices and higher output (static efficiencies). In this context, low concentration levels and strong residual competition on existing product markets are considered important for the achievement thereof.[7]

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[1] *Press release 27 March 2017*, http://europa.eu/rapid/press-release_IP-17-772_en.html.
[2] Council Regulation (EC) 139/2004 of 20 January 2004 on the control of concentrations between undertakings, OJ L24 (2004).
[3] European Commission decision 27 March 2017, Case M.7932 (*Dow / DuPont*).
[4] The key component of crop protection products which produce the desired biological effect (that is, killing the pest or making it inoffensive). A crop protection AI can be classified according to five aspects: the plant(s) to be protected (some AI's are used across several crops), the pest(s) against which it acts (some AI are effective against several pests), the mode of action, the chemical class and the molecule.
[5] M. Vestager, 'Competition: the mother of invention', *speech at European Competition and Consumer Day*, Amsterdam 18 April 2016, https://ec.europa.eu/commission/commissioners/2014-2019/vestager/announcements/competition-mother-invention_en.
[6] P. Ibáñez Colomo, 'Restrictions on Innovation in EU Competition Law', *European Law Review* 2016.
[7] M. Laskowska, 'Dynamic Efficiencies and Technological Progress in EC Merger Control', Working Paper CCLP (L) 2013-29.

Innovation however is associated with dynamic competition. Innovation-driven competition is characterized by frequent product introductions, followed by rapid price declines.[8] A dynamic analysis does not necessarily focus on market power and its externalization on product markets, but is more concerned with market dynamics in a longer-term. Moreover, innovation often occurs outside established markets and more importantly, can disrupt an entire industry.[9] In this dynamic view of competition, market structure is of lesser importance as of the fact that concentration is a likely outcome of market selection. In today's economy, innovative companies are rewarded high market shares. In an innovative environment, more concentrated industries can be a perfect example of effective innovation competition. A dynamic analysis takes into consideration dynamic efficiencies. These efficiencies, which stimulate innovation and investment, are difficult to quantify and often materialize in the future. On the other hand, dynamic efficiencies in general are good for the economy as whole and bring about large benefits for consumers.[10]

These differentiated viewpoints on competition call into question the predominant focus on a static analysis. It touches at the core of EU competition law and administrative action, asking whether innovation is best served seeking a competitive equilibrium or by conducting an analysis on differential gains and losses. This critical view of the appropriate standard of administrative action is part of an extensive scholarly debate which seems to center around the question whether EU competition law, in its currents state, is capable of addressing the challenges of the modern economy or, is hindered by its deep embedment in neoclassical theory. Instead of contributing directly to this scholarly debate, this thesis focusses more on the practical application of innovation as a competition law standard in EU merger control, and more specifically, its application in the assessment in horizontal mergers.

At the heart of this thesis lies a detailed assessment of the development of the Commission's decisional practice of innovation competition in merger control proceedings, and more importantly, its evolution thereof. This thesis will show that the Commission has extended and sophisticated its analysis of innovation competition, gradually evolving throughout the years. An important claim of this thesis is that the *Dow/DuPont* decision introduces several novelties, which will have its implications for future mergers falling under the jurisdiction of the European Union (**"EU")**. Notwithstanding the practical implications of these developments, one should be careful to overstate the significance thereof. By no means does the *Dow/DuPont* decision constitute a radical departure of previous decisional practice. In fact, the analysis is largely in line with the structure-conduct-performance approach, specified towards R&D. Or to put it differently, old wine in new bottles.

Even in the absence of a radical departure of decisional practice, the thesis calls the legal framework into question. In essence, the EUMR and the Horizontal Merger Guidelines ("**HMG**") provide the Commission with enough flexibility to partially apply the legal framework towards the assessment of innovation competition, but unfortunately, it lacks conviction.[11] *A priori,* the legal framework does not reflect the evolution of decisional practice, which, in light of legal certainty and clarity, is unsatisfactory. Hence, the thesis calls for careful consideration for a revision of the HMG.

This thesis is divided in three chapters. In chapter 2, the difficulties surrounding the integration of innovation as a parameter of EU competition law will be highlighted. It does so by providing an overview of the predominant focus of said law in the traditional static application. Further conceptual problems discussed relate to the unclear and ambiguous relationship between concentration levels and innovation, and the existing frameworks in merger control which, although

[8] J.G. Sidak & D.J. Teece, 'Dynamic Competition in Antitrust Law'*, Journal of Competition Law & Economics* 2009, volume 5, issue 4.

[9] J.A. Schumpeter, *Capitalism, Socialism and Democracy*, New York: Harper & Row 1942.

[10] V. Kathuria, 'A conceptual framework to identify dynamic efficiency', *European Competition Journal* 2015, volume 11, issue 2-3.

[11] Guidelines on the assessment of horizontal mergers under the council regulation on the control of concentrations between undertakings, OJ C31, 5 February 2004.

proven useful in numerous cases, fall short by the fact that they inherently coincide with the structural approach, focusing on the relationship between market power and innovation.[12] In chapter 3, the thesis will turn to the practical application of the notion of innovation competition in EU merger control, starting with the legal framework. In the subsequent sections, the *Dow/DuPont* decision will be contrasted with previous merger decisions with the goal to accurately describe the gradual evolution of decisional practice, while simultaneously presenting several novelties exhibited in the former. The final sections of this chapter call for a revision of the HMG. Chapter 4 will provide an overall conclusion. A final remark concerns the cut-off date of this thesis, which is February 2018. Consequently, this thesis does not cover the *Bayer/Monsanto* decision of 21 March 2018.[13]

1.1. Methodology

A doctrinal approach was used in the writing of this thesis. Materials that were examined are: EU legislation, soft-law instruments, policy briefs, speeches and other miscellaneous sources, articles, scholarly books and case-law.

The thesis was written by conducting an extensive multi-disciplinary study focusing on the applicable law, economic theories and industry characteristics, which in my opinion was necessary to fully understand the issues at play in the *Dow/DuPont* decision, and for that matter, the larger issue, namely the applicability of EU competition law to the modern economy. In short, the thesis is largely divided in a theoretical part (chapter 2), and a part which focusses more on the practical application of innovation as a parameter of EU competition law, specified towards the area merger control (chapter 3).

The *Dow/DuPont* decision is the focal point of this thesis, of which several authors argued that the Commission adopted a novel theory of harm. This can be contrasted to view of the Commission, which in its Merger Brief specifically denied any notion thereof.

Before coming to such conclusions myself, it was necessary to understand the identity of EU competition law, and its overall applicability towards the assessment of innovation competition. This necessitated me to research the difference between a dynamic and static viewpoint of EU competition law, and which of those two influenced said law predominantly (Drexl and Colomo). However, at first I researched the concept of innovation itself, asking myself the question what does it actually entail. In that respect articles by Larouche proved most useful.

Another question that arose during the writing of this thesis was that of the desirability and appropriateness of competition law enforcement towards the assessment of innovation competition, which relates directly to the unclear and ambiguous relationship between concentration levels and innovation. This interplay between economics and competition law, taken together with the economic justifications for intervention argued by the Commission in the *Dow/DuPont* decision, made understanding the leading economic theories pivotal for the writing of this thesis (Schumpeter, Arrow, Aghion et al. and Shapiro). The leading theories are summarised in section 2.5, accompanied by a critical analysis of two recent publications which seem to advocate an object-type restriction on R&D-intensive mergers (Haucap and Stiebale, Frederico, Langus and Valletti), with the salient detail that one of those publications was written by members of the Chief Economist's Team, be it in their personal-capacity.

In the third chapter, I examined the EUMR and HMG and several adopted frameworks which are of direct relevance towards the assessment of innovation competition. In order to be able to give an informed opinion about a possible divergence of previous decisional practice by the Commission, representative merger decisions were analyzed, and compared to the *Dow/DuPont* decision.

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[12] B. Kern, 'Innovation Markets, Future Markets, or Potential Competition: How Should Competition Authorities Account for Innovation Competition in Merger Reviews', *World Competition Law: Law and Economics Review* 2014, volume 37, no. 2.

[13] European Commission decision 21 March 2018, Case M.8084 (*Bayer / Monsanto*).

Scholarly articles by recognized authors, including, but not limited to, Kern, Drexl, Petit and Colomo were used to gain useful insight in the working of (EU) merger control in the area of innovation competition. The final part of this thesis, which focuses on the gradual evolution of decisional practice and the need for a revision of the HMG, was inspired by discussions with my supervisor and an extensive case analysis.

The conclusion lays the groundwork for a more ideological discussion on the development of EU competition law and how it can properly deal with innovation, without its predominant reliance on the structural approach, taking into account articles written by Teece, Katz and Shelanski, Conick, Kerber and Haucap.

2. INNOVATION AS A PARAMETER OF EUROPEAN UNION MERGER CONTROL

Competition authorities are well aware that innovation is of vital importance in today's economy. Businesses do not necessarily compete on prices as they do on innovation, be it the development of new products or the improvement of existing ones. In other words, competition is taking place on the level of innovation. As a key factor to economic growth and prosperity, innovation considerations therefore take a prominent role in competition law policy as competition is considered key by the Commission to unlocking the full innovative potential of a given industry.

If innovation is a relevant competition parameter, competition law thus has its role in persevering, or even fostering innovation. How to integrate this specific role of competition law is however not as straightforward against the backdrop of the function of EU competition law to guarantee a system of undistorted competition.[14] EU competition law was built around the framework of static competition. In these static markets, problems mainly related to the possibility that concentration and distribution of power provided on the supply side could lead to an increase in the price or at least the price/performance ratio, and hence profitability, within the market, at the expense of demand and of consumers ultimately.

In this static understanding of competition, the definition of the relevant market is a crucial first step, in that it identifies the degree of competitive pressure on the identified companies, examining to what extent their behaviour is influenced and, limited by its competitors. This market structure methodology in a way fails to truly grasp the dynamics at play when innovation is the main parameter of competition. The competitors on the relevant market do not necessarily compete on innovation and market shares can be misleading of innovative strength. If innovation is to have a decisive role one can question the examination of innovation concerns based on a static framework without the inclusion of dynamic elements in which market power would play a more limited role. However, the academic literature is divided on whether, beyond identifiable harm to competition, competition law should play any role in the enhancement of innovation.[15]

A further complication is that economic research has yet been unable to give a definite answer whether innovation thrives in competitive markets, or more concentrated ones, and how mergers actually affect innovation incentives/activities, not only on the merging parties, but also on the remaining competitors.

This chapter will highlight the difficulties surrounding the integration of innovation as a parameter of EU competition law which includes an analysis of the existing frameworks in EU merger control.

[14] J. Drexl, 'Innovation as a Parameter of Competition and its Implications for Competition Law Application', Discussion Paper 2016.

[15] For example see Colomo (cit. ft. 6), Drexl (cit. ft. 13) and J. Haucap, 'Merger Effects on Innovation: A Rationale for Stricter Merger Control', Discussion Paper 2017.

2.1. The concept of innovation

To get a grasp of innovation considerations in EU Merger Control it is necessary to briefly explain the concept of innovation itself. The Oslo manual defines innovation as the implementation of a new or significantly improved product (goods or services), process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations.[16] For the purpose of this thesis it is worthwhile to go into some detail regarding the definition of process and product innovation as it is set out in the Oslo Manual.

Process innovation concerns the implementation of a new or significantly improved production and delivery method. Process innovations can be intended to decrease unit costs of production or delivery, to increase quality, or to produce or deliver new or significantly improved products.[17] Product innovation is characterised in the Oslo manual as the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics.[18]

The two types of innovations set out above are in the academic literature regarded as technological innovations. In this definition two further categorisations are necessary components for the understanding, with all its difficulties, of innovation as a parameter of competition law. The first categorisation is that of sustaining and disruptive innovation. Sustaining innovation takes place within the value network of the established firms and gives customers something more or better in the attributes they already have.[19] Disruptive innovation on the other hand takes place outside the value network of the established firms, introducing a different package to customers.[20]

A second categorisation of technological innovation is defined as incremental and breakthrough innovation. Incremental innovation can be understood as a small step forward from the state of art. On the other hand, breakthrough innovation is a significant divergence of the state of art.

The difference between the abovementioned categorisations is as follows; Incremental and breakthrough innovation refers to the technological process and links the innovation to the state of art. Sustaining and disruptive innovation relates to the relationship between the innovation and the value network around it.[21] These different types of innovation are of direct relevance in considering innovation as a parameter of competition law and also give an introduction of the difficulties of its integration. Disruptive innovation for example takes place outside of the boundaries of the relevant market, however, still has to create sufficient overlap with the value network of incumbent firms of an existing market as to attract customers thereof. This type of innovation is not easily captured in the static understanding of EU competition law, but is nonetheless essential for consumer welfare.

It is furthermore of importance to capture in a broader sense the applicable timeframe, meaning, in which phase of innovation EU competition law comes into play. If companies compete on innovation, where does competition law place itself, at the moment of implementation, or, beforehand?

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[16] *Guidelines for Collecting and Interpreting Innovation Data, Oslo Manual* 2005, 3rd edition, http://www.oecd.org/sti/inno/oslomanualguidelinesforcollectingandinterpretinginnovationdata3rdedition.html.

[17] *Ibid.* at par. 163-164.

[18] *Ibid.* at par. 156.

[19] A. de Streel & P. Larouche, 'Note on Disruptive Innovation and Competition Policy Enforcement', OECD, Directorate for Financial and Enterprise Affairs Competition Committee, Global Forum on Competition, DAF/COMP/GF (2015)7, Session III.

[20] *Ibid*.

[21] *Ibid.*

Innovation set out in the Oslo manual (see the categorisation above) defines innovation as being implemented, thus, being put on the market.[22] This emphasis on implementation is, if one is of the opinion that the process of innovation is worthy of protection, unduly restrictive and rightly raises the question of effectiveness of intervention. If competition authorities only apply competition law to the very last step of implementation of innovation, it would fail to react to conduct that eliminates, or at the very least make more difficult innovation activities. Hence, if innovation is indeed considered an important parameter of competition law, it could be argued that in order to ensure effective intervention, competition authorities should protect competition in innovation throughout the entire innovation process. The process understood as a search for the development or creation of new knowledge, characterised by true uncertainty, creativity and high unpredictability.[23]

The importance of understanding the different types of innovation lies in the role of EU competition law in protecting innovation, and its limits therein. As will be shown in the upcoming paragraphs, this is a question which the courts of the European Union and the Commission are also struggling with.

2.2. The Static EU Competition Law Framework

In the EU competition law framework, innovation plays (for a substantial part) a subsidiary role in supporting the market power approach. Indeed, one of the major difficulties surrounding the integration of innovation in EU competition law is that the framework is static. This particular dimension of competition is concerned with the rivalry between firms on parameters as price, quality and output. EU competition law revolves around the analysis of the relevant market and, at the time of intervention, observable competitive constraints. The very logic of EU competition law revolves around evaluating the impact of a practice on competition, and, starts with a general presumption that concentrated markets are less competitive than less concentrated ones.[24]

The foundation of the static approach lies in the analysis of the relevant market. The relevant market includes all products or services that compete with each other or can be seen as substitutes by consumers on the basis of their characteristics, prices and intended use.[25] Although it is part of the long understanding of EU competition law that the market definition is not an end in itself, but only an instrument for the competitive assessments, it is nonetheless an important qualitative first step in a structured effects-based investigation, as it enables to scope the competitive landscape and identify the relevant (potential) competitors.[26] It is a tool to identify and define the boundaries of competition between firms.[27] Its purpose, to identify in a systematic way the competitive constraints the concerned firms face.

The relevant market is defined at the starting point of the Commission's analysis, and is presumed to remain constant throughout. In this analysis market power is ascertained, the implications of firm conduct are assessed, and even the remedies are crafted against the market definition.[28]

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[22] *Guidelines for Collecting and Interpreting Innovation Data*, Oslo Manual 2005, 3rd edition, http://www.oecd.org/sti/inno/oslomanualguidelinesforcollectingandinterpretinginnovationdata3rdedition.html, par. 150.

[23] W. Kerber, 'Competition, Innovation, and Competition Law: Dissecting the Interplay', Joint Discussion Paper Series in Economics 2017-42.

[24] Colomo (cit. ft. 6).

[25] Commission Notice on the definition of relevant market for the purposes of Community competition law [1997] OJ C372/5, par. 7.

[26] *Roundtable on market definition: Note by the Delegation of the European Union*', DAF/COMP/WD 2012-28.

[27] Commission Notice on the definition of relevant market for the purposes of Community competition law [1997] OJ C372/5, par. 2

[28] Streel & Larouche (cit. ft. 17).

The product market definition has an important limitation when it comes to innovation competition. In the relevant market, not all competitors might invest heavily in R&D and competition can come from outside the market.[29] In the Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, the Commission mentions the possibility to look at R&D investments to determine the relevant market.[30] This approach is however limited in case of non-observable R&D poles. For example, in case of the pharmaceutical industry, products need to go through a lengthy regulatory approval procedure, which in turn provides enforcement agencies a reasonable impression on innovation competition. As will be shown in the next chapter, the Commission has developed a tested framework regarding the assessment of these specific cases. Outside these special markets which are heavily regulated, the assessment of innovation competition becomes increasingly difficult.

A definition of the relevant market based solely on R&D as an input investment to new products and technologies has several limitations. Notwithstanding the overall importance of R&D, it does not equal innovation, and it is not certain that R&D investments will lead to commercially successful downstream products. Furthermore, R&D is not necessarily the main driver of innovation in an industry and internal innovation, in light of the growing importance of external sourcing of R&D, cannot be considered the only source of innovation.[31] This broader understanding of innovation competition renders to a certain extent the reliance on the definition of the relevant market in a static matter imperfect.

EU competition law is particularly dependent on market power, and thus the focus on preservation of observable competitive pressure and less on the imposition of a specific type of competitive behaviour. For example, mergers are subject to control which identifies, and then limits the degree of market concentration. A few examples will illustrate the static framework in which EU competition law operates:

- In article 102 of the Treaty on the Functioning of the European Union (**"TFEU")** and merger proceedings, a firm is presumed to enjoy a dominant position if its markets shares on the relevant market exceeds 50%;[32]
- Vertical restraints are compatible with art. 101 TFEU if the market shares of the supplier and distributor do not exceed 30%;[33]
- The R&D Block Exemption Regulation relies on non-exempted hard-core restrictions, such as price –fixing.[34] This mentioning of this exclusion of such restrictions is not a critique as to its inclusion in the Regulation but highlights the tendency towards a static analysis;
- The influence of the more economic approach, and thereby the quantification anti-competitive effects, have made it more difficult for the Commission to focus on the effects

[29] Kerber (cit. ft. 21).

[30] Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements [2011] OJ C11/1.

[31] R. Piergiovanni & E. Santarelli, 'The More You Spend, the More You Get? The Effect of R&D and Capital Expenditures on Biotechnology Patens', Working Paper 2012. The authors argue that in several industries the innovation process involves a well-balanced combination of inputs from both R&D and new machinery and capital equipment.

[32] European Court of Justice 3 July 1991, Case C-62 / 28 (*AKZO Chemie BV v Commission of the European Communities*).

[33] Commission Regulation 330/2010 of 20 April 2010 on the application of Article 101(3) of the Treaty on the Functioning of the European Union to categories of vertical agreements and concerted practices [2010] OJ L102/1, art. 3.

[34] Commission Regulation No 1217/2010 of 14 December 2010 on the application of Article 101(3) of the Treaty on the functioning of the European Union to categories of research and development agreements, [2010] OJ L 335, p. 36.

on non-static parameters. The Commission's focus to quantify anticompetitive effects necessarily guide them towards static parameters like price, which are easier to consider in a competitive assessment than the more difficult and long-term innovation effects;

- Efficiencies in EU merger control are based on the static framework. Firms wishing to state particular gains resulting of notified transaction have to provide, under art. 79 of the HMG, that the efficiencies are substantial, verifiable, timely and benefit consumers in the relevant market.[35] The expected efficiencies, according to the Commission, have to accrue in a two to four year timeframe. Dynamic efficiencies in this context are very difficult to substantiate.

In this static framework innovation does have a role as an object of harm. This harm often occurs as a result of the reduced competitive pressure, which acts as a disincentive to investment and innovation, for both the power holder and for its competitors. As will be shown in the next chapter, innovation concerns in merger control proceedings still (predominantly) rest on the premise of in-market competition, the harm to innovation is an unwanted consequence of the restriction on the competitive process. Hence, the theory of harm is established by the finding of a connection between an abstractly determined impact on innovation and a restriction of competition or rather by the definition of the first as a demonstration of the latter.

This does however not entail that EU competition law cannot be adjusted (to a certain extent) accordingly to the specifics of a case. Presumptions of dominance are rebuttable. In the context of merger control, the HMG explicitly acknowledge that the accumulation of market shares may lead to higher appropiability, which may increase a firms' ability and incentive to bring new innovations to the market and thereby, the competitive pressure on rivals to innovate in the market.[36] Moreover market shares are understood to be an imperfect indicator of market power and can be adjusted in light of the nature and operation of the relevant market. Indeed, paragraph 8 of the HMG states that the Commission is unlikely to identify horizontal competition concerns in a merger with a post-merger Herfindahl-Hirschman Index ("**HHI**")[37] between 1000 and 2000 and a delta below 250, or a merger with a post-merger HHI above 2000 and a delta below 150, except if one or more merging parties are important innovators in ways not reflected in market shares.[38] Current market shares therefore may be adjusted to reflect reasonably certain future changes, for instance in the light of exit, entry or expansion. Lastly, the Commission interprets market shares in the light of likely market conditions, for instance, if the market is highly dynamic in character and if the market structure is unstable due to innovation or growth.[39]

Merger control is the field of EU competition law where the Commission has been least hesitant to take innovation into account as parameter of competition (although the leading cases historically came about art. 102 TFEU decisions). This is a logical consequence of the fact that authorities have to make predictions on the development of the market. In this framework, agencies can more easily take into account incentives to innovate for potential negative effects on competition in future markets.[40] As will be explained in the next chapter, the possibility of identifying a significant impediment of effective competition ("**SIEC**") in light of non-coordinated effects provides the Commission with a certain flexibility in assessing innovation related cases. Even more, through its

[35] Guidelines on the assessment of horizontal mergers under the council regulation on the control of concentrations between undertakings, OJ C31, 5 February 2004, paragraph 79.
[36] Guidelines on the assessment of horizontal mergers under the council regulation on the control of concentrations between undertakings, OJ C31, 5 February 2004, paragraph 38.
[37] The Herfindahl-Hirschman Index is a commonly used measure of market concentration.
[38] Guidelines on the assessment of horizontal mergers under the council regulation on the control of concentrations between undertakings, OJ C31, 5 February 2004, paragraph 8.
[39] *Ibid*. at par. 15.
[40] J. Drexl, 'Anti-Competitive Stumbling Stones on the Way to a Cleaner World: Protecting Competition in Innovation without a Market', *Journal of Competition Law and Economics* 2012, volume 8, issue 3.

authority to impose conditions on a given merger-proposal, the Commission can protect innovation, for instance by requiring the divestment of a particular R&D unit.

The incorporation of dynamic elements in the Commission's analysis is furthermore provided for in the Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements.[41] With respect to R&D efforts, it mentions competition in innovation. R&D co-operation may not only affect competition in existing markets, but also competition in innovation and new product markets. The effects on competition in innovation are important in these situations, but can in some cases not be sufficiently assessed by analysing actual or potential competition in existing product/technology markets.[42]

It is interesting to see how the Commission seems somewhat caught in between in its static framework on the one hand, and the need to take into account dynamic considerations on the other hand. In the case of observable R&D, it can be analysed whether after the agreement there will be a sufficient number of remaining R&D poles. The starting point of the analysis is the R&D of the parties after which credible competing R&D poles have to be identified.[43] However, if the innovative efforts in an industry are not clearly structured so as to allow the identification of R&D poles, in the absence of exceptional circumstances, the Commission will not try to assess the impact of a given R&D co-operation on innovation, but would limit its assessment to existing product and/or technology markets which are related to the R&D co-operation in question.[44]

Having examined the static framework of EU competition law, the questions arises how the dynamic dimensions of innovations can be integrated therein. Colomo puts forward a compelling argument that in the current state of EU competition law innovation concerns can only be addressed indirectly.[45] Meaning, if the Commission is in a position to show, to the requisite legal standard, that firms' ability/incentive to compete on the relevant market has been reduced as a consequence of a given practice, it is not necessary to quantify precisely the impact on a particular parameter of competition. As long as the analysis revolves around the definition of the relevant market and the, at the time of intervention, observable competitive restraints, a theory of harm consisting of harm to innovation fits the logic of contemporary enforcement.[46] On the other hand, the direct introduction of innovation considerations in which intervention is deemed justified not because harm to the competitive process has been established, but because the practice is considered to have a negative impact on the rate of innovation, is considered problematic in the sense that EU competition law is not a tool to achieve optimal outcomes.[47]

As compelling this argument may be, the recent decisional practice of the Commission points towards the direct introduction of innovation considerations and, as will be shown in the next section, dynamic elements are introduced in a competition analysis.

2.3. European Union Competition Law, between Dynamic and Static

In this section the argument is put forward that the Commission, under the guidance of the Courts of the EU, applies the static framework to innovation, but also (be it incidentally) the dynamic dimension to EU competition law, departing from market structure. To explain this both approaches will be set out, with the goal to provide the contrast between them.

As set out in detail in the previous section, with regard to the traditional application of EU competition law, the primary analysis rests on the definition of the relevant market, which is

[41] Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements [2011] OJ C11/1.
[42] *Ibid*. at par. 119.
[43] *Ibid*. at par. 120.
[44] *Ibid*. at par. 122.
[45] Colomo (cit. ft. 6).
[46] *Ibid.*
[47] *Ibid*.

examined as to define the competitive parameters. In this context, innovation considerations are put forward to illustrate the nature and operation on that market. The identification of market power, and how that power translates externally is deemed sufficient to establish harm to consumers. Consumers are in a way indirectly protected. The anti-competitive effects arising out of a dangerous accumulation of market power does not have to be substantiated. If harm to innovation on the other hand takes centre stage, innovation in itself should be able to substitute market power, and the examination would be whether innovation is promoted or impaired. In such an analysis, harm to consumers is presumed.

An important step towards innovation as a direct object of harm, and the introduction of dynamic elements in a competition analysis can be found in the *Microsoft* case.[48] The General Court (**"GC")** held that Microsoft's refusal to license its interoperability information to rivals constituted an abuse of a dominant position under art. 102 TFEU. Furthermore, the refusal to deal with competitors was considered not only abusive where it prevents the emergence of already developed products, but also where it is likely to stifle follow-on innovation and, the requirement of the elimination of all competition from the relevant market was relaxed to a standard of marginalisation of competitors.[49]

The GC introduced dynamic competition considerations to justify remedial actions with the goal of creating a level playing field. In the *Microsoft* case, the GC not only focussed on the overall issues in the market, but also on its long-term working. The difference here is that in previous cases, the focus was on individual elements in the market and the conditions therein. Hence, although the examination of the GC was still in reliance of structural market conditions, it examined market power in the context of dynamic competition and the structure of the market itself as susceptible to change.

This marks a clear departure from previous established (static) case-law. In the static approach innovation concerns were examined from market structure. Indeed, innovation related cases like *Magill*,[50] *Bronner*[51] and *IMS*[52] focussed on specific competitors and products, and innovation was examined separately from market structure. In the *Microsoft* case, the examination was of the overall market structure with innovation being the main object of protection. Moreover, instead of deterring certain anti-competitive behaviour, the focus was on a broader and longer-term industry structure, trying to create perfecting market structure conditions, leaning towards sector regulation.

This approach seems to have been transposed towards the assessment of non-horizontal mergers, and more specifically, in the *Intel / McAfee* case.[53] The Commission raised concerns regarding the possible bundling of CPUs and chipsets on the one hand, with McAfee's security solutions on the other hand. In particular, the Commission was concerned that as a result of the acquisition other companies' security solutions might have suffered from a lack of interoperability with Intel CPUs and chipsets or from a technical tying between the latter and McAfee's security solutions. This would negatively affect the rivals ability and incentives to innovate. Hence, the anti-competitive risks associated with the acquisition arose merely out of the competitive advantage the merged entity would derive as a result thereof. By resorting to dynamic considerations, the Commission was able to validate its claims. Competitors of McAfee explained that reduced profits would lower their ability to invest in R&D activities.[54] This type of intervention is regulatory in nature and aims at maximising innovation, in this context market power plays a secondary role and has as a consequence that harm to innovation is considered as harm to consumers. Hence, harm to innovation is not solely a negative consequence of market power but instead harm to innovation has its direct object in EU competition law.

[48] General Court 17 September 2007, Case T-201 / 04 (*Microsoft Corp v European Commission*).
[49] *Ibid*. at par. 563.
[50] European Court of Justice 6 April 1995, Case C-241 / 91 P and C-242 / 91 P (*Magill)*.
[51] European Court of Justice 26 November 1998, Case C-7/97 (*Bronner)*.
[52] European Court of Justice 29 April 2004, Case C-418/01 (*IMS Health)*.
[53] European Commission decision 26 January 2011, Case COMP / M.5984 (*Intel / MacAfee*).
[54] P. Ibáñez Colomo, 'Innovation considerations in EU competition Law', Discussion Paper 2015.

Notwithstanding the dynamic considerations applied in several cases, it is worth emphasizing that EU competition law remains predominantly static. Innovation as a new product is static as the anti-competitive conduct aimed at preventing the emergence of a new product, is aimed at eliminating a competitive constraint. Possible anti-competitive behaviour which seeks to eliminate a defined observable competitive constraint can be caught by the Commission without having to resort to dynamic considerations.

The same applies to so called competition in innovation.[55] In this setting firms engage in R&D to come up with a product first to gain a competitive advantage, vis a vis its competitors. This competitive environment is beneficial for customers if it increases the likelihood that the product will be developed and accelerates its launch.[56] The assessment of competition in innovation in the market remains static. This is however contingent on the question whether or not it revolves around the identification of observable R&D, meaning, the investment steered towards a particular product. In such a setting, it is possible to identify the competitors engaged in the same innovative activities and thus, the observable competitive constraints.

Lastly, innovation as a parameter of competition law has mostly been applied by the Commission in a static manner, meaning, as a dimension over which firms compete in the short-term. Innovation is considered by the Commission to illustrate the nature and operation on the relevant market. In the realm of merger control, the Commission will start with the analysis of the relevant market. In light of several market specifics (entry barriers, buyer power), the Commission may argue that as a consequence of the merger, the firms involved will not be subjected to enough competitive constraints. If innovation is an important parameter of competition in the relevant market, the Commission will state how it expects the merger will affect this parameter, without having to quantify this in detail.[57]

The overall painted picture provides a confusing view. The framework is static, but through a gradual evolution of case-law dynamic elements are introduced, as well as a direct introduction of innovation considerations. It is precisely this evolution which lies at the heart of this thesis and is the main point of analysis in the upcoming chapter when the examination of innovation competition is specified towards the area merger control.

2.4. Potential Competition, Future Markets and Innovation Markets

In merger control, several frameworks have been applied to assess the impact of mergers on innovation competition, these specific analytical tools which will be discussed in turn are: potential competition, future markets and innovation markets.[58] The analysis will include several practical challenges and limitations of these frameworks.

Potential competition cases in merger control refer to situations in which a company, already active on a given market, merges with a potential competitor not yet active on the market. The HMG provide in detail when competition concerns can arise involving a merger with a potential competitor.[59] First, the potential competitor must already exert a significant constraining influence or there must a significant likelihood that it would grow into an effective competitive force. Second, there must not be a sufficient number of other potential competitors, which could maintain sufficient competitive pressure after the merger. The Commission applied this framework in several pharmaceutical merger decisions, and although intervention was based upon protecting competition

[55] Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements [2011] OJ C11/1, par. 119-122.
[56] Colomo (cit. ft. 51).
[57] General Court 9 March 2015, Case T-175 / 12 (*Deutsche Börse AG v European Commission)*.
[58] In Chapter 3 the practical application of these frameworks are examined.
[59] Guidelines on the assessment of horizontal mergers under the council regulation on the control of concentrations between undertakings, OJ C31, 5 February 2004, paragraph 58-60.

in the current market, innovation took centre stage.[60] The concern in these cases is that while the other company currently operating on the market, post-merger, parallel R&D efforts would be abandoned. However, the framework of potential competition does not fully catch the dynamics of innovation. Indeed, the concept of potential competition limits its application towards the assessment of innovation competition by requiring likely and timely market entry.[61]

Another approach adopted by the Commission is the concept of future markets. The focus is on future competition on a market that is not yet there, but that is likely to soon come to fruition thanks to innovation.[62] This framework is best understood as an extension of that of potential competition, it fills the gap of the former by allowing for considerations of innovation competition irrespective of the respective firms role on existing product markets.[63] In so far as R&D must be assessed in terms of its importance for future markets, the relevant product market is, by its very nature, defined in a less clear-cut manner than in the case of existing markets. However, both the potential competition and future markets framework can only apply in case of observable R&D poles. Moreover, both approaches inherently coincide with the structural approach, focusing on the relationship between market power and innovation.[64]

The last approach is that of "innovation markets". Gilbert and Sunshine proposed this concept and it attempted to move away from potential product competition, and towards actual innovation competition.[65] In order to address innovation concerns in merger control, they proposed five steps to assess anti-competitive effects of a merger:

1. Identify the overlapping R&D activities of the merging firms;
2. Identify alternative sources of R&D that are reasonable substitutes for the activities of the merging firms;
3. Evaluate actual and potential competition from downstream products which would render a reduction in R&D unprofitable;
4. Assess the increase in concentration in R&D that would occur as a result of the merger;
5. Assess whether the merger would lead to R&D efficiencies, offsetting a potential reduction in R&D investments.[66]

Gilbert and Sunshine recommended its assessment only applicable in cases in which R&D activities could be identified towards specific downstream markets. This qualification limited the use of innovation markets to cases in which innovation is sufficiently advanced that effects on downstream markets can be reasonably predicted and in which the pool of innovation competitors could be determined.[67] The underlying idea is an identification of a set of competitors who have, in the light of the specifics of the industry, the (specialized) assets and capabilities needed to innovate. Thus, the focus is not only on overlapping (observable) R&D, but also on the identification of specialized assets that are needed for R&D. In the US a prominent case which accounted for the notion of specialized assets was the proposed acquisition of Northrop Grumman by Lockheed Martin.[68] The Department of Justice ("**DoJ**") analysed innovation competition by focussing on the specialized assets. Besides looking at parallel R&D efforts, there was a long-term innovation concern:

[60] An overview is provided in section 3.2.
[61] Guidelines on the assessment of horizontal mergers under the council regulation on the control of concentrations between undertakings, OJ C31, 5 February 2004, paragraph 58-60.
[62] R. de Conick, 'Innovation in EU merger control: in need of a consistent framework', *Competition Law & Policy Debate 2016*, volume 2, issue 3.
[63] Kern (cit. ft. 12).
[64] *Ibid*.
[65] R. Gilbert & S.C. Sunshine, 'Incorporating Dynamic Efficiency concerns in Merger Analysis: The Use of Innovation Markets', *Antitrust Law Journal* 1995, volume 63, no. 2.
[66] *Ibid*.
[67] M.L. Katz & H.A. Shelanski, 'Mergers and Innovation', *Antitrust Law Journal* 2006.
[68] United States v. Lockheed Martin Corp., Civ. No. 98-00731.

"*Northrop, Lockheed, and Boeing do all pursue new ideas and designs for future high companies that have the capabilities to compete for combined electronics system integration and military airframe upgrades*. *The loss of Northrop as an independent entity will reduce the number of companies to which the Department of Defence can turn to design, develop, and product high performance fixed-wing military aircraft from three to two*."[69]

What especially stands out in this line of reasoning of the DoJ is the necessity of maintaining a minimum number of independent firms with the specialized assets necessary for innovation. Meaning, the protection of such specialized assets is worthy of protecting itself and innovation competition is protected by accounting for these assets.

The innovation market approach was widely criticized in the academic literature. Rapp for example stated that the authors either erred or made a leap of faith. The error being equalising R&D with innovation and the leap of faith being the presumed positive functional relationship between the rate of R&D expenditure and the rate of innovation produced by a firm.[70] Another point of critique was the simple transfer of the structure-conduct-performance paradigm to innovation.[71] Indeed, the flaw of the innovation market approach is that although it dully takes into account innovation, it is still grounded on structural concerns and takes a static approach to competition. Meaning, the emphasis is still on the number of firms and, on the presumed never-changing market structure with a strong emphasis on the concept of concentration of R&D. It fails to prove why the transfer of a traditional market share analysis towards R&D assets and activities is appropriate, why the overlapping R&D lines are worth protecting and, more importantly, truly captures the dynamic character of innovation. One can also question the appropriateness of the sole consideration of maximization of R&D (input) instead of targeting output more directly.

2.5. Merger Control, Innovation and Economics

One of the key issues of innovation as a competition law standard is the unclear and ambiguous relationship between concentration levels and innovation. This section summarises important economic research that has been published, but more importantly highlights the absence of a definite answer which competitive environment and firm size is most beneficial for innovation to thrive.

When it comes to the optimal level of concentration regarding innovation two opposing views still play a large part in today's discussion. The first is at the hands of Schumpeter.[72] Schumpeter's concept of creative destruction entails that monopolistic firms might be more innovative due to better financing of R&D through past monopoly profits, and higher incentives for appropriating the benefits of innovation.[73] In his hypothesis, larger firms and more industry concentration yield the most positive effects on innovation.

Arrow on the other hand, argues that a firm with market power might conduct less innovation due to cannibalization effects and hence, a less concentrated market has positive effects on innovation.[74] Gilbert and Newbury on their part point out that when a dominant firm is faced with

[69] *Ibid*.
[70] R.T. Rapp, 'The Misapplication of the Innovation Market Approach to Merger Analysis', *Antitrust Law Journal* 1995, no. 1.
[71] Drexl (cit. ft. 38).
[72] Schumpeter (cit. ft. 9).
[73] Kerber (cit. ft. 21).
[74] K.J. Arrow, 'Economic Welfare and the Allocation of Resources for Invention', in: The Rate and Direction of Inventive Activity: Economic and Social Factors, Princeton, Princeton University Press 1962.

an outsider the dominant firm, trying to maintain his dominance, has more to lose. Hence, this strategic effect means that the dominant firm has a greater incentive to innovate.[75]

The innovation incentives to escape competition, and the effect of establishing or defending dominance by innovation were further introduced by Aghion et al.[76] The authors argue that the relationship between concentration and innovation follows the shape of an inverted U, i.e. that for low levels of competition, innovation initially increases as competition becomes more intense, and after reaching its peak, innovation decreases as competition intensifies further.[77]

An important contribution to the debate was provided by Shapiro.[78] According to Shapiro three principles need to be taken into account to understand the relationship between competition and innovation:

1. Contestability: this considers to what extent the incumbent firm's position can be contested. In the author's view innovation flourishes if markets remain contestable;
2. Appropriaiblity: the ability to capture the social benefits to innovative efforts, spurs innovation;
3. Synergies: a combination of complementary assets that enhances innovation capabilities, can spur innovation.[79]

Shapiro argues that the Schumpeterian and Arrowian schools of thought do not necessarily conflict, but actually converge on the above-mentioned principles.

Haucap and Stiebale focussed directly on the impact of mergers on the innovation activities of firms in the pharmaceutical industry.[80] Sixty-five pharma mergers that were scrutinized and approved by the Commission were the object of their research which resulted in three main conclusions: mergers in R&D intensive industries reduce the merging parties and, the competitors innovation incentives, competition agencies should consider innovation activities and not limit themselves to potential or future product markets and lastly, general innovation activities are measured by R&D expenditure and R&D intensity.[81]

In 2017 Frederico, Langus and Valletti (the Commission's Chief Economist and colleagues from the Chief Economist Team, writing in personal capacity) published a paper which provides a simple model of mergers and innovation.[82] The authors claim that merging parties always decrease their innovation efforts post-mergers, while the outsiders to the merger respond by increasing their effort and, that a merger tends to reduce overall innovation. One of their key propositions is that total industry effort decreases after a merger if and only the number of firms in the industry is low enough.

Overall, empirical and theoretical studies have not come to a definite conclusion about which market structures or firm sizes are most beneficial to innovation competition. It is precisely this uncertainty that highlights the question on the appropriate limitations of enforcement policy in the area of innovation competition. In that respect, the two previously mentioned publications, which seem to advocate an almost by-object type restriction of R&D-intensive mergers, can be considered

[75] R. Gilbert, 'Preemptive patenting and the persistence of monopoly', *The American Economic Review* 1982, volume 72, no. 3.
[76] P. Aghion et al., 'Competition and Innovation: An Inverted-U Relationship', *Quarterly Journal of Economics* 2005.
[77] *Mergers and innovation: fewer players, more ideas?, Oxera Agenda* 2017, https://www.oxera.com/Latest-Thinking/Agenda/2017/Mergers-and-innovation-fewer-players,-more-ideas.aspx.
[78] C. Shapiro, 'Competition and Innovation: Did Arrow Hit the Bull's Eye', in: J. Lerner & S. Stern, *The Rate and Direction of Inventive Activity Revisited*, Chicago: University of Chicago Press 2012.
[79] *Ibid*.
[80] J. Haucap & J. Stiebale, 'Innovation Suffers When Drug Companies Merge', *Harvard Business Review* 2016.
[81] *Ibid*.
[82] G. Federico & G. Langus & T. Valletti, 'A simple model of mergers and innovation', *Economic Letters* 2017, volume 157.

as important contributions to the scholarly debate regarding the effects of mergers on innovation but nevertheless, it should not give rise to general assumptions used by competition law authorities in merger control proceedings.[83]

The former[84], by focussing solely on R&D as the sole input of innovation activities disregards other important sources of innovation and, the analysis largely excludes measuring innovation with additional indicators.[85] Essentially, it links exclusion with a decrease in R&D, failing to comprehend innovation as a process to which several factors contribute, while simultaneously transferring the structural approach towards R&D investments. The latter is highly dependent on the parameters used.[86] Meaning, under certain parameters innovation efforts would increase in more concentrated industries.[87] The economic assumptions in the model further limit its general application in merger control, i.e. the model assumes that innovation capabilities are homogenous, product differentiation is not an objective of innovation effort and increased profits resulting from the post-merger price increase are not accompanied by increased innovation efforts.[88]

3. INNOVATION COMPETITION IN EUROPEAN UNION MERGER CONTROL

The previous chapter highlighted the more theoretical part of considering innovation as a parameter in EU competition law. We now turn to the practical application of this parameter in the context of merger control.

In its policy brief of April 2016, the Commission spells out the importance of innovation as a critical component for the success of its top priority of boosting jobs, growth and investment.[89] In the policy brief it is argued that the EUMR allows the Commission to assess the impact of mergers and acquisitions on innovation, and that competitive harm caused by a reduction of innovation is placed on an equal footing with increased prices and reduced output.[90] As we will see in this chapter, the Commission throughout the years has become increasingly comfortable applying the legal framework towards the assessment of innovation related cases, and is gradually extending its scope.

The *Dow/DuPont* decision is bound to stir up quite a debate in the legal scholarship, partly due to its extensive divestment obligations, with some authors speaking of a quantum leap and even of a novel theory of harm in European merger control. Petit for example argues that the Commission has adopted of theory of harm grounded on the belief that a merger can and should be prohibited where it can be demonstrated that it will lead to a reduction of innovation in a given industry as a whole.[91] Other authors fear of the creation of a de facto by object type presumption for R&D-intensive mergers, against which it is difficult for the parties to argue, strengthened by the structural

[83] A critical note is provided in light of, on the one hand, the similarity exhibited of the conclusions proposed in the publication of Haucap & Stiebale and the framework applied by the Commission in the assessment in the *Dow/DuPont* merger, and on the other hand, the pronounced opinion expressed by the members of the Chief Economist Team in their paper.

[84] Haucap & Stiebale (cit. ft. 78).

[85] J. Hagedoorn & M. Cloodt, 'Measuring innovative performance: is there an advantage in using multiple indicators', *Research Policy* 2003, volume 32, issue 8.

[86] Federico & Langus & Valletti (cit. ft. 80).

[87] A. Lofaro & S. Lewis & P. Abecasis, 'An Innovation Merger Assessment? The European Commission's Novel Theory of Harm in the Dow/DuPont Merger', *Antitrust* 2017, volume 32, no. 1.

[88] F. Carlin, 'Do all mergers really harm innovation?', *LinkedIn* 6 July 2017, https://www.linkedin.com/pulse/do-all-mergers-really-harm-innovation-fiona-carlin.

[89] *Competition Policy brief* 2016, issue 1, http://ec.europa.eu/competition/publications/cpb/2016/2016_001_en.pdf.

[90] *Ibid*.

[91] N. Petit, 'Significant Impediment to Industry Innovation: A Novel Theory of Harm in EU Merger Control?', White Paper 2017-I.

imbalance that persists, especially in the context of innovation competition, in the arguing of merger specific efficiencies.[92]

The Commission however stresses that it is business as usual. In the competition merger brief of July 2017, the Commission rationalizes the *Dow/DuPont* decision as being based on sound economics, and more importantly, on previous decisional practice, stating: "*the concerns as regards innovation were based in large part on pipeline-to-pipeline innovation competition and the concern that the parties would discontinue, delay or re-orient some of those competing pipeline efforts post-merger. There was also a forward-looking concern that the parties would reduce in the future their overall innovation effort, but this second concern was complementary to the first and not novel: similar forward-looking concerns were raised by the Commission in GE/Alstom or Deutsche Börse/Euronext*."[93]

In this chapter the argument is put forward that it is not business as usual. By comparing the *Dow/DuPont* decision with previous decisional practice several novelties were discovered. Through a gradual evolution of decisional practice, the examination of innovation competition has become more extensive and sophisticated. It will be argued that although the Commission did not overstep its discretion, the EU merger control framework does not accurately reflect these developments and should therefore be revised.

3.1 The Legal Framework

The European merger control framework centers around the notion of a SIEC. Article 2 of the EUMR states that: *"[a] concentration which would significantly impede effective competition, in the common market or in a substantial part of it, in particular as a result of the creation or strengthening of a dominant position, shall be declared incompatible with the common market*".[94]

Before continuing the assessment of the legal framework applicable towards the assessment of innovation competition, the historical development of the focus of the Commission on non-coordinated unilateral effects deserves some explanation, as to put the *Dow/DuPont* decision in policy perspective.

R&D-intensive industries, like the agrochemical, tend to be more concentrated. Recital 25 of the EUMR emphasizes that in oligopolistic markets a healthy degree of competition can be exhibited, however, under certain circumstances, concentrations involving the elimination of important competitive constraints that the merging parties had exerted upon each other, as well as a reduction of competitive pressure on the remaining competitors, may, even in the absence of a likelihood of coordination between the members of the oligopoly, result in a SIEC.[95]

The novel SIEC was adopted after a perception that there was a possible gap in the coverage of the EUMR that arose as a result the *Airtours/First Choice* judgement by the GC.[96] The Commission prohibited Airtours' proposed acquisition of First Choice which would have resulted in a reduction of major tour operators in the United Kingdom from four to three. Given the fact that no firm was individually dominant, the Commission prohibited the transaction on the basis that it would create a collective dominant position, however the Commission reasoned that it could establish collective dominance without the need to act for any of the remaining firms in a coordinated manner, hence, the issue was one of unilateral conduct. The GC annulled the Commission's decision in which it emphasized the need of collective dominance being accompanied by coordinated effects. Hence, it

[92] G. Bushell, 'EU Merger Control and the Innovation Theory of Harm: Fake News?', *Kluwer Competition Law Blog* March 3 2017, http://competitionlawblog.kluwercompetitionlaw.com/2017/03/03/eu-merger-control-and-the-innovation-theory-of-harm-fake-news/ & Haucap (cit. ft. 14).
[93] *Merger Brief* 2017, issue 2, http://ec.europa.eu/competition/publications/cmb/2017/kdal17002enn.pdf.
[94] Council Regulation (EC) 139/2004 of 20 January 2004 on the control of concentrations between undertakings, OJ L24 (2004), article 2.
[95] *Ibid*. at recital 25.
[96] General Court 6 June 2002, Case T-342/99 (*Airtours plc v European Communities*).

followed that the notion of 'dominance', which has been extensively discussed in article 102 TFEU proceedings[97], was not readily available outside of these specific cases, and especially in situations involving presumed non-collusive oligopolies.

The solution to close this gap was surprisingly easy and adopted by the European Council in the 2004 EUMR.[98] The test is now (as can be seen in article 2(2) and 2(3) of the EUMR) whether a merger would lead to a SIEC, *in particular* by creating or strengthening a dominant position, the previous merger regulation stated that a SIEC could be established if the merger would create or strengthen a dominant position.[99]

Consequently, while collective dominance used to play a prominent role in oligopolistic market cases, the Commission at present almost exclusively relies on the framework of unilateral effects. Not only is the burden of proof substantially lower in these specific cases, it also provides the Commission flexibility to not focus solely on the market leader anymore, that is, it reaches out to situations outside single firm dominance.[100]

Returning to the legal framework relevant to the assessment of innovation competition, as mentioned earlier, the EUMR is not confined to the assessment of price effects, but also sets a framework for assessing the likely effects of concentration on other criteria, such as innovation. It is up to the Commission to show that a firm will not be (or is unlikely to) subject to effective competitive constraints. In the case of merger control, a SIEC does not require the direct assessment of a given practice on prices, quality or innovation. A SIEC can be established to the requisite legal standard if the Commission is able to show that as a result of the proposed transaction, the competitive pressure on the merging parties would be significantly weakened.[101]

The effect of a transaction can be established by proxy, meaning, by assessment of the relevant market and the merging parties specific position in that market. This was for example established by the GC in the blocked merger between Deutsche Börse and NYSE Euronext in which the GC substantiated that the impact on innovation was sufficiently clear in light of the loss of the unique and intensive competitive pressure between the merging parties in certain innovation activities.[102]

The HMG contain several provisions which provide the Commission with enough flexibility to assess a proposed transaction on innovation considerations. Paragraph 8 of the HMG indicates that effective competition brings benefits to consumers, such as low prices, high quality products, a wide selection of goods and services and innovation.[103] Through merger control, the Commission has the authority to prevent mergers that would be likely to deprive customers of these benefits by significantly increasing the market power of the merging firm. Increased market power is interpreted as also encompassing the ability to diminish innovation. More importantly, paragraph 8 of the HMG specifically mention that the notion 'increased prices' is used as shorthand for the various ways in which a merger may result in competitive harm, including innovation.[104]

The importance of innovation as a competitive restraint[105] or as an important competitive force[106] is recognized throughout the HMG. Paragraph 38 of the HMG notes that: "*a merger may increase the firms' ability and incentive to bring new innovations to the market and, thereby, the*

[97] See for example: European Court of Justice 13 February 1979, Case 85/79 (*Hoffman-La Roche & Co. AG v Commission of the European Communities*).
[98] Council Regulation (EC) 139/2004 of 20 January 2004 on the control of concentrations between undertakings, OJ L24 (2004).
[99] R. Wish & D. Bailey, *Competition Law*, Oxford: Oxford University Press (2012).
[100] S. Thomas, 'The known unknown: in search of a legal structure for the significance criterion of the SIEC test', *Journal of Competition Law & Economics* 2017, volume 13, issue 2.
[101] Colomo (cit. ft. 6).
[102] General Court 9 March 2015, Case T-175 / 12 (*Deutsche Börse AG v European Commission*).
[103] Guidelines on the assessment of horizontal mergers under the council regulation on the control of concentrations between undertakings, OJ C31, 5 February 2004, paragraph 8.
[104] *Ibid.*
[105] *Ibid.* at par. 22 (a) and 24.
[106] *Ibid.* at par. 38.

competitive pressure on rivals to innovate in that market. Alternatively, effective competition may be significantly impeded by a merger between two important innovators, for instance between two companies with 'pipeline' products related to a specific product market. Similarly, a firm with a relatively small market share may nevertheless be an important competitive force if it has promising pipeline products". Hence, it recognizes on the one hand possible increased ability and incentives to bring new innovations to the market (for example through increased appropiability) however, on the other hand, it mentions the possibility of a SIEC if two important innovators merge, for instance if the transaction encompasses companies with pipeline products related to a specific product market.

Considering paragraph 38 of the HMG, the innovation potential of the merging firms can be taken into account, regardless of the current market position of the companies. The Commission examines firms that are not yet present in a given market but are potential competitors and firms that are developing products that are likely to compete in new product markets.[107]

The assessment of innovation competition thus considers whether a proposed transaction reduces important competitive constraints on one or more sellers and significantly impedes effective competition considering not only the loss of competition between the merging firms, but also the reduction of competitive pressure on other market participants. The loss of product variety brought about by less innovation harms consumers by depriving them of choice and reducing competition on rival products.

In short, the HMG provide the Commission with enough flexibility to consider (at least partially) innovation competition. This is recognized by the ECJ which clarified that the prospective analysis the Commission has to consider in assessing proposed transactions consist of an examination of how a concentration might alter the factors which determine the state of competition on a given market, in order to establish whether it would give rise to a SIEC.[108]

Notwithstanding the applicability of the HMG towards innovation competition, it should be noted that the HMG and the EUMR stay relatively quiet on R&D and innovation (in the case of EUMR innovation is conspicuous by its absence). The HMG recognise several dynamic elements (for example the lesser importance of market shares if the merging parties are important innovators) but it does not state the most common issue, the discontinuation of parallel R&D. Besides, the recognition of the dynamic character of innovative markets, innovation as a parameter by which businesses compete, and equating harm to innovation to harm with other static parameters, the complex process of innovation remains largely untouched. Essentially, the HMG seem to provide the Commission with the flexibility to transpose the unilateral effects analysis towards innovation related cases, but they do not contain an indication how innovation effects are to be analysed.

3.2. Case Analysis

Through an in-depth analysis of several high-profile innovation related merger decisions it can be concluded that the Commission throughout the years has sophisticated and expanded the scope of its analysis of innovation competition.

Innovation considerations in merger control proceedings are inserted by the Commission in several ways. R&D is examined to delimit the boundaries of the relevant market but also to establish (or argue against) easiness of entry, meaning, R&D expenditure is qualified as an entry barrier. In the relevant market, innovation activities are set out to show that it is the main parameter of competition, which can have several implications for the competitive assessment, for example a lesser emphasis on market shares.

Moreover, R&D is taken into account to assess the competitive strength of parties in the relevant market and to examine the R&D potential in an industry. The Commission considers competition key in innovation, thus it primary focus is the loss of competition between the merging

[107] *Competition Policy brief* 2016, issue 1, http://ec.europa.eu/competition/publications/cpb/2016/2016_001_en.pdf.
[108] Court of Justice 15 February 2005, Case C-12 / 03 P (*European Commission v Tetra Laval BV*), par. 43.

parties, although more recently innovation incentives of the remaining competitors are too subject of investigation.

A merger between market leaders is the most commonly identified competition concern, nevertheless, it will be shown in the following section that structural concerns have to a certain extent been of lesser importance, which especially holds true for mergers involving parallel R&D lines. Furthermore, the Commission acknowledges the difficulties surrounding assessing R&D and its importance for (future) markets but is not hesitant to do so. The Commission conceives R&D investment as a substitute of market power, transposing the structural approach towards this particular asset. In this view, R&D is a competitive constraint, largely divorced from the process and uncertainties surrounding innovation.[109] Finally, although sporadically the Commission's analysis touches upon the issue of reduced innovation incentives of non-merging parties, the examination is largely limited towards the expected changes in innovative output of the parties to the transaction.

Notwithstanding the fact that the previously stated factors are indeed common patterns in the Commission's analysis, it should be highlighted that from the establishment of merger control at EU level up to the present, no clear framework has yet been established.

Laskowska conducted an extensive review of 155 phase II merger decisions, which covers the timeframe from the establishment of merger control at Community level in December 1989 up to September 2008.[110] Her main criticism is the lack of consistency and the use of unsubstantiated assumptions which the Commission displays in the reviewed merger decisions. In cases of a merger between two important innovators, the negative impact on R&D is merely assumed, and countervailing reactions of competitors are dismissed mechanically. Harm to long-term competition is generally not an examination of potential harm but rather a statement, and little or no regard is given to the dynamic character of reference markets.[111] This lack of consistency is indeed problematic in light of the enhanced focus on innovation in merger control proceedings.

The following merger decisions that are reviewed are those involving companies with strong R&D potential, overlapping pipeline products and / or the elimination of a(potential) competitor against an (existing or future) product market.

1. *Du Pont / ICI*[112]

The *Du Pont/ICI* transaction provides an example of the Commission's decisional practice regarding the loss of competition between leading firms and the effect of the loss of that competitive pressure on innovation in the relevant market.

The transaction concerned the proposed acquisition of ICI, a UK based group with international activities in particular in chemical and related industries, by Du Pont, a US-based group with worldwide activities in particular in the chemical and petroleum industries.

The competitive analysis rests on an assessment of Du Pont's presence in the nylon carpet fibre market. The market exhibits competition in particular with regard to quality and innovation, and competition in product development between ICI and Du Pont in the past has been an import source of innovation.[113] Of particular concern was that due to the loss of competition between the leading firms, innovation would diminish in the relevant market.

Indeed, the commitments provided for by Du Pont which proved vital for the Commission's approval of the transaction was that the former would take the necessary steps to enter into good faith negotiations with interested third parties so as to ensure improved competition.[114] The Commission found that this would significantly improve the competitiveness of the third parties and

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[109] *Merger Brief* 2017, issue 2, http://ec.europa.eu/competition/publications/cmb/2017/kdal17002enn.pdf.
[110] M. Laskowska, 'A global View of Innovation Analysis in EC Merger Control', Electronic Paper 2013.
[111] *Ibid*.
[112] European Commission decision 30 September 1992, Case No IV / M.214 (*Du Pont / ICI*).
[113] *Ibid*. at par. 47.
[114] *Ibid*. at par. 48.

thus substantially reduce the likelihood that Du Pont could be able to determine the degree of product development and innovation in the market.[115]

The decision is a useful indicator showing the early approach the Commission took towards the assessment of innovation competition. Innovation is considered a parameter of competition (equated with other static parameters) affected by the transaction and the competitive assessment corresponds to the indirect approach set out by Colomo.[116]

2. *Pasteur / Merck*[117]

The focus of the Commission's investigation was the effect of the merger on R&D for future pipeline products.

The transaction concerns an operation under which Pasteur and Merck will organize their existing activities in the human vaccines and related businesses within the territory of the European Communities and EFTA through a Joint Venture. Regarding the overlap in future vaccines, the Commission states that each of the parties is active in R&D work for a series of vaccines, but their R&D pipeline for vaccines in later stages of development overlapped only as regards Hepatitis A and varicella vaccine for use in normal children. Their pre-clinical trial research overlapped only in a pneumococcal conjugate vaccine.[118]

One of the concerns expressed by the Commission was grounded on the fact that the Joint Venture established a Development Committee, which could lead to the coordination of basic R&D activities of the parents. In the view of the Commission this coordination was likely to have an appreciable effect in light of the parties' important position on the vaccine markets (worldwide presence, R&D budget) on R&D *for future pipeline products in the EEA*, although it simultaneously acknowledged that due to the extremely broad range of future research and the lack of precise indications as to the chances of bringing successful products to the markets a competitive assessment is extremely difficult.[119]

The competitive assessment was anchored in a specific (future) product market, namely, pipeline products in monovalent vaccines. The merger was eventually cleared after the acceptance by the Commission of efficiencies related to technological progress and distribution.[120]

3. *Glaxo / Wellcome*[121]

The Commission focussed on the impact of the concentration in the area of R&D. The transaction involved the acquisition of Wellcome by Glaxo, both U.K. based pharmaceutical companies.

The Commission considers that in the pharmaceutical sector, in order to be a complete competition assessment, it has to investigate products which are not yet on the market but which are at an advanced stage of development.[122] Interestingly, the Commission provides that any such attempt at product market definition may be problematic in the HIV / Aids area and that in the absence of a definitive treatment thereof the combination of the R&D resources and expertise of both parties is not likely to inhibit to a significant extent the research for effective compounds for the treatment of HIV infections, being undertaken by other pharmaceutical companies.[123]

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[115] *Ibid.* at par 48 (5).
[116] See ft. 45.
[117] European Commission decision 6 October 1994, Case IV / 34.776 (*Pasteur Mérieux / Merck*).
[118] *Ibid.* at par. 26.
[119] *Ibid.* at par. 64.
[120] *Ibid*. at par. 82-101.
[121] European Commission decision 28 February 1995, Case IV / M.555 (*Glaxo / Wellcome*).
[122] *Ibid. at* par. 9.
[123] *Ibid.* at par. 33.

In light of the commercial attractiveness of the market, the Commission did not find a competitive issue regardless of the fact that the merging parties were recognised as leading firms in the area with overlapping R&D.

4. *Ciba / Sandoz*[124]

This decision concerns an analysis of future markets, R&D potential and innovation as the main parameter of competition in several affected industries.

The transaction consisted of a merger of Ciba and Sandoz, resulting into a new single undertaking Novartis. The competitive assessment focussed on the parties' strong presence as suppliers of pharmaceutical products. Both parties involved were active in the research, development and production of active chemical substances and in the production and marketing of pharmaceutical products.[125] The length of time needed for R&D as well as the heavy expenditures involved in marketing pharmaceutical products were considered the main barriers to entry.

The Commission assessed, in accordance with its decisional practice, future markets meaning, examination of products which are not yet on the market but which are at an advanced stage of development.[126] Innovation (and the role of future markets) was thus accounted for to define the reference product and geographic market but also to refer to entry barriers.

The Commission took the position that when evaluating the importance of R&D for future markets, the relevant product market must be defined in a less strict manner than in the case of existing markets.[127] The competitive assessment with regards to future markets concerned HS-TK gene therapies for tumours of which the Commission stated: "*The market strength of the undertakings in research and development is difficult to estimate since success in R & D can usually be assessed only after the R&D has been completed. Nevertheless, the undertakings' existing R&D potential cannot be ignored in the competitive assessment since their future competitive strength is bases precisely on such potential.*"[128]

The assessment largely relies on the creation or strengthening of a dominant position on the future market for gene therapies for tumours in light of identified patents and Phase II/III testing.[129] Due to several uncertainties in the process of patent applications, and the success of the gene therapy as a method of treatment, the Commission could not, with sufficient probability, say that the merger would on any future market lead to the creation or strengthening of a dominant position.[130]

The competitive assessment continues with respect to crop protection products, of which the decision dedicates an individual section towards R&D in the industry.[131] The dynamic character of the market is emphasized by referring to quick successions of new products, hence, a strong market position is not expected to be a guarantee for future success.[132] Furthermore, the Commission observes that according to the suppliers of crop protection products, large capacities are no guarantee of the success of R&D projects[133], however, it estimates that due to economies of scope in R&D expenditure, Novartis, will maintain and possible extend the position as market leader which it has in the crop protection sector. Nonetheless, due to specific industry characteristics: market share fluctuations, the large number of competitors with significant R&D capacities, a large number of

[124] European Commission decision 17 July 1996, Case No IV/M.737 (*Ciba-Geigy / Sandoz)*.
[125] *Ibid*. at par. 52-53.
[126] *Ibid*. at par. 44.
[127] *Ibid*.
[128] *Ibid.* at par. 95.
[129] *Ibid.* at par. 100-107.
[130] *Ibid.* at par. 105.
[131] *Ibid.* at par. 170.
[132] *Ibid*.
[133] *Ibid*. at par. 171.

product launches, entries to and exits from all the markets concerned, price disciplining effect of generics and countervailing power of wholesalers and agricultural cooperatives, the Commission concluded that the transaction did not create or strengthen a dominant position as a result of which effective competition would be significantly impeded in the common market or a substantial part of it.[134]

With regard to Animal Health Products, R&D is considered with respect to the parties' competitive advantage due to the size of their R&D divisions and hence, the critical mass required for undertaking innovation activities in the sector.[135]

In the seeds market, since improved products quickly establish themselves on the market, the R&D potential of a competitor is of decisive importance as regards the assessment of its market position. The parties spend about 10 % of the turnover generated in the seeds sphere on R&D.[136] The prospective analysis of the development of the market was that new technologies developed in recent years (in particular in molecular biology and genetic engineering) would probably lead to new market entrants.[137] As in the case of the crop protection assessment, fluctuating markets shares due to innovation activities in the industry counteracted the possible negative effects of the transaction, resulting in an absence of the finding of a SIEC.

The Commissions acknowledged the limitations of a static approach towards innovation concerns and instead took dynamic elements into account to assess the competitive situation in the by the transaction affected industries. Indeed, market shares were deemed of lesser importance and an unreliable indicator to fully understand the competitive situation, emphasis is put on the necessary R&D of the relevant players and the dynamic character of the affected industries is understood by the Commission as a countervailing effect of what at first sight might be deemed a concentrated industry giving rise to competition concerns.

5. *Glaxo Wellcome / SmithKline Beecham*[138]

In this decision the effects of a merger on R&D markets is accompanied by an assessment of the impact on the overall R&D potential in the industry.

The transaction concerned the merger between Glaxo Wellcome (**"GW"**) and SmithKline Beecham ("**SB"**) (both active in human pharmaceuticals and SB in vaccines, OTC products and health-care related products), by which the merged entity GlaxoSmithKline was to be established.

The Commission considered R&D in terms of its importance on existing as well as on future markets. An overlap where either one or both parties had existing products on the market and pipeline products are asthma/COPD, anti-migraine (N2C), therapeutic vaccines and other urologicals, including antispasmodics (G4B). Areas where neither party were currently active on the market but had pipeline products were diabetes (A10B), oncology (L1) and irritable bowel syndrome.[139]

The parties argued that that no competition concerns could arise in asthma/COPD because SB did not produce or market any anti-respiratory products. The Commission however stressed the need to take into account SB's pipeline products in the respiratory tract, and, it needed to be assessed what the impact of the transaction on existing markets and on R&D markets was.[140] With regard to asthma, GW and SB had shown that the pipeline product of SB would be commercialized and furthermore provided evidence that several competitors were developing Phase II pipeline products, hence no competition concern arose.

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[134] *Ibid*. at par. 176.
[135] *Ibid*. at par. 222.
[136] *Ibid*. at par. 299.
[137] *Ibid*. at par. 301.
[138] European Commission decision 8 May 2000, Case COMP / M.1846 (*Glaxo Wellcome / SmithKline Beecham*).
[139] *Ibid*. at par. 150.
[140] *Ibid*. at par. 174.

The analysis regarding COPD gave rise to more concern, specifically, the Commission investigated whether SB's pipeline products (to be classified in a new ATC 3 category)[141] in the treatment of COPD would further strengthen GW's existing strong position in the field of respiratory tract and, lacking a horizontal overlap, whether the compound was likely to affect the overall market position of the new entity in the respiratory field and whether the overall R&D potential was likely to be reduced.[142] The PDE4 inhibitor of SB in Phase III was to represent a novel approach to the treatment of COPD.

The market investigation showed that several competitors had PDE4 inhibitors in the pipeline and, competitors also showed large innovative activities in COPD treatment with compounds other than PDE4. Hence, the Commission concluded that COPD is an attractive market for future research and development. The height of unmet clinical need thus represented commercial attractiveness for pharmaceutical companies and R&D was not expected to diminish in the industry as was the elimination of existing R&D by SB and GW.[143] While, as indicated by the Commission, it was feasible to believe that the parties would streamline their R&D efforts in the future, given the large number of current pipeline products and resourceful competitors on the market, the Commission did not consider that this would have led to the diminution of the overall R&D potential either.

The investigation of the Commission centred around the impact of the transaction on the overall R&D potential. However, the assessment of the effects of the merger on innovation competition was clearly linked to SB's PDE4 inhibitor. Meaning, the assessment was limited to the future product market, and the effect of the merger on innovation, related to that product market. Hence, the Commission conducted an analysis of the pipeline product towards the R&D potential of the combined entity.

6. *Bayer / Aventis*[144]

This decision concerns the R&D potential of the merging parties and the effect of the combination of R&D assets. With the transaction Bayer, active in healthcare, agricultural business, polymers and the chemical business sought to acquire all shares of the agrochemical business of Aventis.

The Commission argued that the dynamics of the agrochemical industry result largely from R&D and market access.[145] It is furthermore observed that in the crop protection industry innovation is the driver of market growth and it points to the existence of a virtuous circle of innovation and finance meaning, the more capital a company can afford to invest in R&D, the more new molecules it will discover and can afford to bring to the market.[146]

In R&D intensive markets the Commission estimates that market entry cannot be generally expected in the short to medium term (hence, large R&D costs are considered a barrier to entry) and that as a result of the transaction, the R&D capabilities of the new entity will be one of the largest in the industry.[147] Due to the parties' successful insecticide pipeline so far, the Commission concludes that the new entity will be one of the few companies in a leading position to launch new compounds

[141] In its previous decisions, the Commission noted that medicines may be subdivided into therapeutic classes by reference to the "Anatomical Therapeutic Chemical" classification (ATC). The ATC is hierarchical and has 16 categories (A, B, C, D, etc.) each with up to four levels. The first level (ATC 1) is the most general and the fourth level (ATC 4) the most detailed. The third level (ATC 3) allows medicines to be grouped in terms of their therapeutic indications, i.e. their intended use, and can therefore be used as an operational market definition. These groups of products generally have the same therapeutic indication and cannot be substituted by products belonging to other ATC 3 classes.

[142] European Commission decision 8 May 2000, Case COMP / M.1846 (*Glaxo Wellcome / SmithKline Beecham*), par. 180.

[143] *Ibid.* at par. 187-188.

[144] European Commission decision 12 July 2000, Case COMP / M.2547 (*Bayer / Aventis Crop Science*).

[145] *Ibid.* at par. 151.

[146] *Ibid.* at par. 16.

[147] *Ibid.* at par. 15.

onto the insecticides market.[148] More importantly, for the purpose of the decision, the Commission highlighted that the parties R&D capabilities and incentives have to be taken into account as regards the *potential elimination of future competition in current product markets and future markets*.[149]

The main concern of the Commission in this decision was the loss of competition between the merging parties, as a result of which innovation would diminish in the relevant market. The impact of the transaction on the innovation activities of the parties was discussed, tied to specific current product and future markets.

7. *Tetra-Laval / Sidel*[150]

This decision, and the subsequent rulings by the GC and the ECJ, provide insight in the standard of proof required regarding innovation incentives and countervailing reactions by competitors. The Commission blocked a transaction between Tetra Laval and Sidel, both active in the packaging business and the evaluation of the proposed transaction on R&D was rested on the competitive advantage of the merged entity on its competitors.[151] The Commission considered this advantage as being an additional factor finding the transaction would create a market structure which would provide the merged entity with the incentives and tools to turn its leading position in PET packaging equipment, in particular SBM machines (low and high-capacity) used for the sensitive product segments, into a dominant position.[152]

An important aspect of the decision with regard to innovation competition is the Commission's assessment of Tetra's diminished need to innovate post-transaction. Competition was highlighted as a key incentive for the companies to innovate in various carton markets while Tetra stressed that the demands of consumers of carton-packaged products drove innovation. The Commission ultimately decided that the notified transaction would create a dominant position in the market for PET packaging equipment, in particular SBM machines used for the sensitive product segments, and strengthen a dominant position in aseptic carton packaging equipment and aseptic cartons in the EEA, as a result of which effective competition would be significantly impeded in the common market and in the EEA, and declared it incompatible with the common market pursuant to Article 8(3) of the Merger Regulation and with the EEA Agreement, pursuant to Article 57 thereof.[153]

Tetra appealed the decision to the GC, and with success.[154] The GC stated that even if the acquisition of Sidel were to reduce the pressure on innovation, the decision did not state why demand from customers would not continue in the future to be the driving force behind innovation, especially in the aseptic carton markets.[155] The Commission failed to substantiate why the incentive to innovate would disappear simply by acquisition of Sidel, and the GC found it unlikely that Tetra, following the modified merger, would be less inclined to continue investing in any innovation possible for the range of equipment and products it offers its customers on the carton markets.[156] Furthermore, the GC criticized the fact that no explanation was given by the Commission why Tetra's competitors could not benefit from a decision by the merged entity to innovate less. Consequently, the contested decision had not established to the requisite legal standard (of proof) that the merged entity would have less incentive than Tetra currently has to innovate in the carton sector.[157]

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[148] *Ibid* at par 153.
[149] *Ibid.* at par. 18.
[150] European Commission decision 30 October 2001, Case No COMP / M.2416 (*Tetra Laval / Sidel*).
[151] *Ibid*. par. 385.
[152] *Ibid*. at par. 389.
[153] European Commission decision 30 October 2001, Case No COMP / M.2416 (*Tetra Laval / Sidel*), par. 452.
[154] General Court 25 October 2002, Case T-5 / 02 (*Tetra Laval BV / Commission of the European Communities*).
[155] *Ibid*. at par. 329.
[156] *Ibid*.
[157] *Ibid*. at par. 332.

Relying on five grounds the Commission appealed the decision before the European Court of Justice ("**ECJ**").[158] With regard to the required standard of proof the Commission alleged an error in law as to the standard of proof which it is required to satisfy and as to the scope of the Court of First Instance's power of judicial review.[159]

The ECJ stated that a prospective analysis of the kind necessary in merger control proceedings must be carried out with great care since it does not entail the examination of past events – for which often many items of evidence are available which make it possible to understand the causes – or of current events, but rather a prediction of events which are more or less likely to occur in future if a decision prohibiting the planned concentration or laying down the conditions for it is not adopted. In that respect the ECJ stated that the prospective analysis consists of an examination of how a concentration might alter the factors determining the state of competition on a given market in order to establish whether it would give rise to a serious impediment to effective competition and that such an analysis makes it necessary to envisage various chains of cause and effect with a view to ascertaining which of them are the most likely.[160]

The ECJ took the position that the GC was correct in stating that the Commission failed to show to the requisite standard of proof that if there is a reduction in potential competition, this will tend to strengthen a dominant position in relation to its competitors on the relevant market.[161] The potential competition represented by a producer of substitute products on a segment of the relevant market is only one of the set of factors which must be taken into account when assessing whether there is a risk that a concentration might strengthen a dominant position. It cannot be ruled out that a reduction in potential competition might be compensated by other factors, with the result that the competitive position of the already dominant undertaking remains unchanged.[162] The ECJ ultimately qualified the grounds of appeal by the Commission as unfounded and dismissed the appeal.

It follows from both judgements that the Commission has to substantiate its claims that, following a merger, the incentives to innovate would diminish. Hence, a general presumption does not hold up in light of the requisite legal standard of proof, the Commission has to take into account the countervailing reaction of competitors and at a very minimum that their envisioned scenario is more likely than plausible alternatives.[163]

8. *Syngenta / Monsanto's Sunflower Seed Business*[164]

The *Syngenta/Monsanto* decision provides insight in the Commission's analysis of possible foreclosure effects which can affect the innovation capabilities of competitors.

This transaction concerns the acquisition by Syngenta, a company active in the agricultural sector, in particular in seeds and crop protection, of a division of Monsanto: its inventories of sunflower seed, germplasm, intellectual property rights ("**IPRs**"), know-how, contracts, commercial data and some employees of Monsanto's sunflower seed business.

The decision starts with an overview of the sunflower seed industry. The Commission characterises it as being a highly innovation-intensive industry, being subject to significant consolidation.[165] The possible harm that could result from the transaction was that by removing a

[158] European Court of Justice 15 February 2005, Case C-12 / 03 P (*Commission of the European Communities / Tetra Laval BV),* par. 17.
[159] *Ibid*.
[160] *Ibid*. at par. 42-43.
[161] *Ibid*. at par. 128.
[162] *Ibid*. at par. 127.
[163] Colomo (cit. ft. 6).
[164] European Commission decision 17 November 2010, Case No COMP / 5675 (*Syngenta / Monsanto's Sunflower Seed Business*).
[165] *Ibid*. at par. 61-62.

significant breeder and market player in the market for trading of seeds is likely to deprive Syngenta's downstream competitors (both actual and potential) of access to an important and large germplasm portfolio, a key input.[166] The effect of such foreclosure would have a sizable impact on prices, quality and choice in the downstream markets and may also have negative effects on prices, innovation and access to external germplasm in the upstream market.

In addition to the more direct effect of the removal of the competitive constraint represented by the Monsanto in the commercialisation of sunflower seed, the merger would also eliminate one of the most important innovators in the sunflower seed market in Spain, thereby ensuring the leading market position of Syngenta in the long run.[167] The same could be said of the competitive situation in Hungary, where Monsanto was equally found to be an important innovator.[168]

Competitors expressed concern that the transaction could hamper competition by removing one of the major R&D capabilities in sunflower seed and therefore possibly lead to a lower rate of innovation. The Commission therefore concluded that the transaction was likely to have a negative impact on innovation by eliminating the competitive constraint that the breeding programme and the germplasm of Monsanto exerted on Syngenta and on other competitors to regularly bring new improved varieties into the market and hence that a SIEC was likely.[169]

The decision represents an innovation concern resulting from a possible foreclosure effect, which would harm the innovation capabilities of competitors. Although the Commission described the possible harm to innovation, a detailed assessment of this effect is absent.

9. *Deutsche Börse / NYSE Euronext*[170]

In this decision structural concerns (which would affect innovation) are assessed together with innovation concerns not anchored in specific product markets.

The Commission blocked the proposed transaction between Deutsche Börse ("**DB**") and NYSE Euronext (**"NYX"**). NYX operates numerous exchanges in the US and Europe. It has four main businesses: (i) cash listing services; (ii) cash trading services; (iii) derivatives trading and clearing services; and (iv) information services and technology solutions. In particular, in Europe, NYX operates NYSE Liffe ("Liffe"), a London-based derivatives exchange that also operates derivatives exchanges in Paris, Amsterdam, Brussels, and Lisbon. [171] DB is a German listed corporation vertically integrated in all aspects of cash and derivatives markets. Its activities include cash listing, trading and clearing, derivatives trading and clearing (through its subsidiary Eurex), cash post-trade services, namely settlement and custody, collateral management and market data and analytics (index licensing and information services). In particular, DB is the operator of the Frankfurt Stock Exchange. The Commission focussed its competitive assessment of the transaction on the markets for European financial derivatives (European interest rate, single stock equity and equity index derivatives) traded on exchanges. [172]

The parties were considered de facto the only two players offering exchange trading in European interest rate futures and options and occupying predominant positions in trading of European single equity derivatives controlling over 90%-100% of all derivatives based on European underlying traded around the world.[173] Investigation showed that exchanges compete on pricing and the cost of trading, to attract liquidity, technology, product innovation and process and market design. In actual

[166] *Ibid*. at par. 160.
[167] *Ibid*. at par. 246, 253.
[168] *Ibid*. at par. 292.
[169] *Ibid.* at par. 321.
[170] European Commission decision 1 February 2012, Case No COMP / M.6166 (*Deutsche Börse / NYSE Euronext*).
[171] *Ibid.*
[172] *Ibid.* at par. 220.
[173] *Ibid*. at par. 498.

competition, product innovation (launch of new European Traded Derivatives contracts) was considered an important parameter because derivatives exchanges may gain additional business through the launch of new products appealing to their members.[174]

In that respect the Commission considered DB and NYX each other's closest competitor being much better placed than any other competitor to engage in similar innovation and therefore represent the closest competitive threat to the success of a new product and an important force behind the need to continually invest in product upgrades.[175] The market investigations had also shown that product market competition and product innovation was reflected in rivalry at an upstream level between them in technology, processes and market design.[176] The Commission concluded that the transaction, by eliminating actual and potential competition between the parties in European interest rate derivatives, equity derivatives and equity index derivatives, lessened the incentive which the merged entity would have to innovate in technology, process and market design in order to respond to these same competitive threats, and would result overall in less innovation being available to customers in those markets.[177]

In the market for single stock equity options and futures the combined entity would achieve a combined market share of 90%-100%. The Commission concluded that it is likely that, as a result of the gravitational effect of its enlarged margin pool, the merged entity would have been able progressively to eliminate the incumbent competitor and achieve a monopoly in all European markets, not just its home markets. This would have eliminated significant fee competition. Due to the market position of the merged entity, new entry was considered unlikely. Reduced competitive pressure was also a factor in considering product innovation.[178] The transaction was presumed to have a negative effect on innovation in derivatives products and technology solution due to the elimination of competition between Eurex and Liffe. Even more, smaller third parties' incentive to innovate would have diminished due to the little chance of commercial success.[179]

In view of separate and non-overlapping IP rights, which DB nor NYX presently has licensed to the other, separate relevant product markets were considered for the trading and clearing of each of the parties' families of existing equity indices.[180] However, the companies did compete on new product launches in the area of trading and clearing of European equity indices.[181] The Commission examined specific product innovations undertaken by Eurex, which in turn were followed closely by an introduction of a new product by Liffe. In light of this observation, the Commission considered both parties each other's actual closest competitor and hence, post-merger, this parameter of competition would have been eliminated.[182]

New entrants into the markets for exchange traded derivatives based on European underlying face high barriers to entry due to the importance of liquidity and the related netting and cross-margining benefits. Moreover, benchmark index products are protected by IPRs. The existence of a large installed base of existing users which distributes' the exchange's products to investors, characterized by unavoidable sunk connection costs, also constitute an important barrier to entry. These barriers to entry made it, in the eyes of the Commission, considerable unlikely that sufficient and timely entry would have occurred post-merger in any of the relevant markets.

The Commission estimated that the transaction would have resulted in a near-monopoly position in each of the relevant markets for trading and clearing services for: European exchange-traded interest rate futures and options, European exchange-traded single stock equity futures and

[174] *Ibid*. at par. 563-566.
[175] *Ibid*. at par. 602.
[176] *Ibid*. at par. 604.
[177] *Ibid*. at par. 640.
[178] *Ibid.* at par. 881.
[179] *Ibid.* at par. 886.
[180] *Ibid*. at par. 431.
[181] *Ibid*. at par.900.
[182] *Ibid*. at par.942.

options, new European exchange-traded equity index futures and options, off-order book services for block size European Traded Derivatives contracts and trade registration, confirmation and CCP clearing services for flexible versions of European equity futures and options traded OTC.[183] The transaction would have given rise to a SIEC by eliminating competition between Eurex and Liffe in respect of product innovation within each of the above mentioned product markets for which they are each other's' closest competitor. All things considered, the Commission concluded that the transaction would significantly impede effective competition in the internal market or a substantial part thereof within the meaning of Article 2(3) of the Merger Regulation and therefore declared it incompatible.

DB unsuccessfully appealed the decision to the GC claiming that the Commission's conclusion that the parties to the merger constrained each other through innovation competition was manifestly incorrect in part because it was unsubstantiated .[184] The GC did not follow this line of reasoning stating that the Commission does not have to evaluate the extent of the reduction in innovation in order to substantiate its conclusions to the requisite legal standard.[185] The Commission claimed in the decision under appeal that the elimination of technological competition between DB and NYX would give rise to a reduction in innovation available to customers in the market. Again, DB claimed that this conclusion was not up to the requisite legal standard given the lack of precise substantiation of harm. The GC however deemed sufficient the evidence showing that the transaction would have eliminated the unique and intensive competitive pressure between the parties in technology, process and market design, ultimately leading to less innovation technology and in turn harming consumers due to this reduction of innovation available to them.[186]

What is of importance is that the Commission considered, albeit not extensively, 'innovation spaces'.[187] Innovation competition was thus not anchored towards a specific product market but examined towards "*the European innovation space for equity indices*".[188] This marks a clear departure from previous decisional practice where innovation competition was assessed within the boundaries of present or future product markets. As will be explained in section 3.3, the Commission developed this concept further in the *Dow/DuPont* decision and was crucial in its analysis of innovation competition. Another relevant aspect of this decision is the fact that the analysis applied by the Commission was validated by the GC.

10. *Medtronic / Covidien*[189]

The *Medtronic/Covidien* decision provides an example of the willingness of the Commission to intervene in transactions involving parallel R&D lines. Intervention in pharmaceutical mergers rely less on structural concerns, but touch upon innovation itself, fearing the abandonment of pipeline products. The Commission took the position that the competitive issue resulting from the transaction differed slightly from the potential competition concerns set out in the HMG, and therefore analysed the impact said transaction against the test for the elimination of future competition, taking into account the elements set out in the HMG pertaining to the elimination of competition between actual competitors, except for the assessment of the market shares of the merging parties.[190]

The transaction concerned the acquisition of Covidien, active in the development, manufacturing and sale of a diverse range of medical devices and supply products, including for

[183] *Ibid*. at par.1483.
[184] General Court 9 March 2015, Case T-175 / 12 (*Deutsche Börse AG v European Commission)*.
[185] *Ibid*. at par. 168.
[186] *Ibid*. at par. 173 & 178.
[187] *Ibid*. at par. 923.
[188] *Ibid*.
[189] European Commission decision 28 November 2014, Case No COMP / M.7326 (*Medtronic / Covidien)*.
[190] *Ibid*. at par. 178-180.

laparoscopic surgery, electrosurgery, biosurgery and vascular therapies, by Medtronic, active in the development of medical technology and provides products, therapies and services treating variety of medical conditions, including cardiac and vascular diseases, diabetes and neurological and musculoskeletal conditions.

The Commission identified concerns with respect to drug-coated balloons (**"DCBs"**) in which Medtronic was a market leader with its IN.PACT product line. Covidien had a promising late-stage pipeline-product, a drug-coated balloon called Stellarex.[191] Other competitors were heavily discounted, this was due the fact that the Commission argued that clinical data is the most important competitive parameter in comparing various DCBs and by examination thereof, only three DCBs were considered to have a sizeable presence in the market and all things considered, Medtronic was found to be a clear market leader.

The Commission continued with a prospective analysis regarding the potential competition to be expected by Covidien's Stellarex. Interestingly, the key competitive parameter could not be taken into consideration, Covidien's Stellarex lacked sufficient clinical data at the time of the assessment.[192] Nevertheless, based on objective criteria (product characteristics and early returns from trials) it was expected that Stellarex was to be a serious contender on the market for DCBs.[193] Therefore, on the basis of the market investigation, the Commission considered that Covidien's Stellarex had the potential of becoming a very effective DCB.[194]

Based on Medtronic's internal documents, it appeared that it was to be expected that, post-transaction, the development of Stellarex would be abandoned. The Commission concluded that the elimination of Covidien's pipeline product following the proposed transaction would result in the loss of a credible competitor which absent the transaction would likely have constrained Medtronic[195] and that transaction would also have a significant effect on innovation in these markets as Covidien had the ability and incentive to continue innovation by further investing in clinical trials and developing Stellarex into a strong contender on the market.[196] Eventually, The Commission's concerns were removed by the divestment of the entire Stellarex business.

The importance of this decision is that it clearly shows that innovation concerns do take centre stage in the Commission's assessment. Although lacking clear data which showed the competitive situation and acknowledging the fact that the potential competition doctrine could not be applied, it resorted to other factors which justified intervention resulting in the divestment of the entire Stellarex business.

11. *GSK / Novartis*[197]

This decision involves an assessment of the effects of a merger on innovation competition related to future markets.

The transaction is that of a share purchase agreement by which Novartis will acquire sole control over GSK's portfolio of oncology pharmaceutical products composed of 10 marketed products and two pipeline products. First, the Commission reiterates that in its previous decisional practice it assessed the potential competitive constraints likely to be exerted by products in R&D on existing products as well on possible future markets.[198] It considers that when R&D activities are assessed in

[191] *Ibid*. at par. 194-196.
[192] *Ibid*. at par. 236.
[193] *Ibid*. at par. 237.
[194] *Ibid.* at par. 242.
[195] The remaining competitors were deemed to be unable to exert sufficient competitive pressure on the merged entity post-transaction.
[196] *Ibid*. at par. 248-249.
[197] European Commission decision 28 January 2015, Case COMP / M.7275 (*Novartis / GlaxoSmithKline Oncology Business*).
[198] *Ibid*. at par. 24.

terms of importance for future markets, the product market definition can be left open, reflecting the uncertainty in analysing products that do not exist as yet[199] and that the product market definition for pipeline pharmaceuticals can be guided primarily by the characteristics of future products as well as by the indications to which they are to be applied.[200]

The competitive assessment rested on the overlap of the merging parties in the market for B-Raf and MEK inhibitors used alone or in combination for the treatment of advanced melanoma.[201] Another concern arose in relation to ongoing Phase I and Phase II clinical trials of both parties which were investigating the potential use of their MEK and B-Raf inhibitors, either as monotherapies or in combination, in a number of other types of cancer, notably colorectal cancer, non-small-cell lung cancer and advanced melanoma brain metastases.[202]

The decision was an interesting development of the Commission's assessment of innovation competition considering the fact that this was the first time in which it assessed pipeline-to-pipeline scenarios, looking at pipeline projects in Phase I and Phase II clinical trials. In light of this novelty, the parties submitted that compounds in Phase I or Phase II clinical trials do not provide a reliable indicator of future market situations, as it is uncertain whether they will enter the market at all.[203] The Commission rebuked this claim by stating that in the pharmaceutical industry, the process of innovation is structured in such a way that it is possible at an early stage, to identity competing clinical research programs, which makes it possible to identify substitutable products by reference to the products characteristics and intended therapeutic use, in particular by reference to their mechanism of action and to the cancer type for which they are being investigated.[204]

In light of the above, the Commission considered that the relevant competing clinical research programs should be identified by reference to the mechanism of action of the pipeline products concerned, the cancer type for which the pipeline products are being trialled in clinical studies and the phase of these clinical trials.

The Commission's investigation revealed that only Roche had a pair of MEK and B-Raf inhibitors that could compete with the parties' pairs of MEK and B-Raf inhibitors as combined therapies in these types of cancer.[205] The transaction therefore would have brought together two among three competing clinical research programs based on the MEK and B-Raf inhibitors which pursued the same unmet medical need, leading to a diminishment of competition in innovation because the incentive that drove the parties' clinical research program was driven by future sales that the program was to generate. Post-transaction, cannibalisation concerns would have the likely effect of a significant reduction of incentives to pursue both MEK and B-Raf clinical research programs in parallel.[206] These reduced incentives would likely manifest itself in the abonnement of Novartis' early stage clinical trial programme of the two drugs.[207] The transaction was ultimately cleared by the Commission subjected to the divestment of the two drugs to pharmaceutical company Array.

The Commission considered future markets, its assessment is focussed on the protection of competition on a market that has not yet come to fruition but due to innovation was likely to be. The theory of harm was that one of the products of the parties would not have been developed as a result of the transaction and therefore would have faced less competition. Only one of the parties' product is developed and introduced in the future market while the other pipeline products are abandoned leading to a reduction of competition.[208] While the decision clearly shows that the

[199] *Ibid*. at par. 26.
[200] *Ibid*. at par. 27.
[201] *Ibid*. at par. 34.
[202] *Ibid*. at par. 84.
[203] *Ibid*. at par. 85.
[204] *Ibid.* at par. 90 and 95.
[205] *Ibid.* at par. 102 and par. 54, investigating the closeness of competition.
[206] *Ibid*. at par. 104-105.
[207] *Ibid*. at par. 113.
[208] Conick (cit. ft. 60).

Commission is looking further into companies' pipelines, innovation competition was still related to relatively specific markets, being MEK and B-Raf inhibitors.

12. *Pfizer / Hospira*[209]

In the *Pfizer/Hospira* merger, the Commission applied the framework of potential competition, meaning a merger of a company already active on a market with a potential competitor not yet active on the market

The transaction concerned the acquisition of Hospira, a global provider of injectable drugs and infusion technologies with a broad portfolio of generic, branded and biosimilar medicines for humans, by Pfizer, a global research based biomedical and pharmaceutical company active in discovering, developing, manufacturing, marketing and selling innovative medicines for humans.

The competitive assessment regarding innovation competition had as focal point infliximab, an anti-TNF (anti-tumour necrosis factor) agent used in autoimmune diseases. As to the competitive landscape[210], taking into account potential competition, several infliximabs would be marketed by Merck, Hospira/ Celltrion (co-marketing the same drug under a different brand-name), Samsung Bioepis, Pfizer (which had an infliximab biosimilar in phase III clinical trial) and possible Epirus (which was at an earlier stage of development).

Interestingly, and unlike in *GSK/Novartis,* the Commission remained largely silent in its analysis on the subject of closeness of competition. Due to its limited experience so far with biosimilar products, it proved difficult to assess, at the time of the decision, the potential commercial success of each of the products.[211] Rather, the Commission considered Pfizer and Hospira/Celltrion strong players in the field of biosimilar.[212] On the other hand, Samsung, as a future entrant, was heavily discounted due to its lack of marketing presence in the EEA while Epirus, which did not have an infliximab biosimilar in an advanced stage of development, was, in the foreseeable future, not expected to become a competitive constraint in the EEA.[213]

The competitive landscape considered, the Commission took the position that in the foreseeable future, the market would be composed of one biosimilar marketed by Hospira and Celltrion, and two future differentiated biosimilar competitors from Samsung Bioepis (with Samsung at an competitive disadvantage) and Pfizer.[214]

The transaction thus represents one of market-to-pipeline, and the Commission took the position that pre-merger the parties' incentives to compete would be reduced in two possible ways: Pfizer would either delay or discontinue its pipeline biosimilar in order to focus on Inflectra, leading to the net loss of one of only three differentiated biosimilars marketed or in advanced stages of development, or, hand back Hospira's Inflectra rights to Celltrion, leading to the loss of price competition between Hospira and Celltrion.[215]

The first outcome would translate into a lessening of competition in innovation. The remedy accepted by the Commission was said to preserve future innovation in biosimilars by providing for the full divestment of Pfizer's infliximab biosimilar drug under development.

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[209] European Commission decision 4 August 2015, Case COMP / M.7559 (*Pfizer / Hospira*).
[210] *Ibid*. at par. 39.
[211] *Ibid*. at par. 46.
[212] *Ibid*. at par. 47-49.
[213] *Ibid*. at par. 51.
[214] *Ibid.* at par. 56.
[215] *Ibid*. at par. 57.

13. *GE / Alstom*[216]

The *GE/Alstom* decision shows the evolution of the Commission's decisional practice in innovation competition, and can be seen as laying the groundwork for the framework applied in the *Dow/DuPont* merger. It goes into great detail regarding innovation competition, not only towards existing pipeline products but it also captured forward-looking R&D capabilities in general.

The Commission cleared the acquisition of Alstom, a global industrial and engineering company, by General Electric ("**GE**"), a global diversified manufacturing, technology and services company. Pursuant to the acquisition, GE would acquire sole control of Alstom's Thermal Power, Renewable Power and Grid divisions.

The main overlap between the parties was the manufacture of heavy duty gas turbines ("**HDGTs**"). A HDGT is a combustion engine that can convert natural gas or other liquid fuels to mechanical energy, which in turn drives a generator that produces electrical energy, the produced electric energy moves along power lines to homes and businesses. HDGTs are differentiated on several performance parameters like output, efficiency and flexibility (start-up time, ramp-up time, part-load efficiency).

The in-depth investigation of the Commission focussed on the market for sale and servicing of HDGTs operating at a 50 Hz frequency.[217] A further segmentation in the market for 50 Hz HDGTs was that of power and output class, which was considered a key feature by customers. Original equipment manufacturers ("**OEMs**") analysed the market for 50 Hz HDGTs in the following output classes: Medium (90 MW- 200 MW), Large (200-320 MW) and Very Large (above 320 MW).[218] The Commission took the position that the relevant market is the overall market for 50 Hz HDGTs, covering the whole output range, and at the level of possible segments (Medium, Large and Very Large) at a worldwide level (excluding China and Iran) and EEA level.[219]

The Commission relied on non-coordinated effects in oligopolistic market theory of harm, the transaction eliminated the number three competitor in the overall (concentrated) market for 50 Hz HDGTs. The most direct effect of the merger consisted of the loss of competition between GE and Alstom, while Alstom was considered not only as an effective constraint on GE, but also on the other OEMs which are: Siemens, MHPS and, to a lesser extent, Ansaldo.[220]

An important factor which the Commission took into consideration was that GE would discontinue Alstom's gas turbine technology for the Large and Very Large segments and all future oriented R&D efforts relating to the Alstom technology.

The market for 50 Hz HDGTs was characterised as an oligopolistic market, with very high barriers to entry and with very high profit margins. The factors taken into account by the Commission whether the significant non-coordinated effects are likely were:

- The large markets shares post-merger;[221]
- The elimination of a significant and close competitor of GE;[222]
- Further reduction of the limited number of alternatives available to customers;[223]
- The elimination of an important competitive force from an innovation and technology point of view;[224]

[216] European Commission decision 8 September 2015, Case M.7278 (*General Electric / Alstom*).
[217] *Ibid*. at par. 103.
[218] *Ibid*. at par. 112.
[219] *Ibid*. at par. 118 & 219.
[220] *Ibid*. at par. 226-229.
[221] *Ibid*. at par. 231.
[222] *Ibid*. at par. 226.234-237.
[223] *Ibid*. at par. 238-242.
[224] *Ibid*. at par. 243-245.

- The discontinuation of Alstom HDGTs and related R&D for the Large and Very Large segment;[225]
- The absence of countervailing factors;[226]
- The irrelevance of the bidding-market defence.[227]

The focal point of this analysis will be on the fourth and fifth point considering these specifically address innovation competition. The Commission examined the effects of the merger on the ability and incentives of the market participants to innovate in the overall 50 HZ HDGTs market where the Commission found that Alstom was a stronger force in innovation than its market shares in the corresponding product market would suggest. To bolster its case, the Commission characterised Alstom's technology distinctive and in many respects best in class in the overall market for 50 Hz HDGTs: in the Large segment Alstom's GT26 has very high CC efficiency power output at the upper-end of the Large segment and is best in class in operational flexibility, in the Very Large segment, Alstom's GT36 has very high CC efficiency, power output at the upper-end of the Very Large segment, best in class operational flexibility and it targets the lowest cost of electricity, in the Medium segment, Alstom's GT13E2 has best in class CC efficiency and power output at the upper-end of the Medium segment.[228]

Market participants confirmed the importance of Alstom as innovator in the market citing its continuous innovation and R&D efforts, which provided it with a strong competitive advantage. Moreover, the innovation of Alstom's GT26 and subsequent upgrades were deemed important in pushing competitors to also innovate in Large 50 Hz HDGTs as well as through its GT13E2 and GT36 in the Very Large and Medium segment.[229]

Alstom's important role in innovating in the market for 50 Hz HDGTs was also evidenced by the high level of its HDGT-related (i) R&D costs and investments ("spend") and (ii) R&D headcount, therefore the Commission considered Alstom being part of the top three HDGTs competitors in terms of R&D for 50 Hz HDGTs, with higher R&D spend than its market shares would suggest, significantly ahead in particular of MHPS and Ansaldo.[230] Further evidence of Alstom's innovative strength was found looking at its capabilities in terms of testing facilities for 50 Hz HDGTs, which represents a significant competitive advantage.[231] Internal documents showed that Alstom had several products in its pipeline which would cover the entire 50 Hz HDGTs market.[232]

In light of Alstom's importance as innovator, the Commission concluded that the transaction would remove an important innovator in the market for 50 Hz HDGTs, thereby reducing the overall competitive pressure on the remaining players, with a reduction in the overall incentives to invest significantly in innovation and therefore that, due to the very high barriers to entry in the market for 50 Hz HDGTs, by removing an important innovator, the transaction would likely to lead to significant and lasting harm on innovation.[233]

Another innovation concern arose through GE's expected synergies created by terminating, post-merger, most of Alstom's R&D capabilities related to HDGTs.[234] The primary concern was the discontinuation of Alstom's GT36 and GT26, which in turn would have its adverse effect on the competitive pressure on the market, most notably on Siemens.[235] In light of the elimination of

[225] *Ibid*. at par. 246-248.
[226] *Ibid*. at par. 249-251.
[227] *Ibid*. at par. 252-263.
[228] *Ibid*. at par. 948-954.
[229] *Ibid*. at par. 955-964.
[230] *Ibid*. at par. 968.
[231] *Ibid*. at par. 969-974.
[232] *Ibid*. at par. 983-991.
[233] *Ibid*. at par. 998-1000.
[234] *Ibid*. at par. 1001.
[235] *Ibid*. at par. 1073.

Alstom's R&D capabilities, the discontinuation of the GT36, the reduced incentives to continue to market the GT26 and develop significant upgrades to it and the reduced competitive pressure on the remaining competitors, the Commission concluded that the transaction was likely to negatively affect further the choices available to customers and to reduce the overall incentives to invest significantly in innovation.[236]

In line with the investigation, the Commission concluded that the transaction was likely to have a significant negative effect on commercial conditions and prices, product choice and innovation, in particular in the Large and Very Large segments of the market for 50 Hz HDGTs. The transaction was ultimately approved after the imposition of the following remedies: the divestment of the technology for the GT26 and GT36 turbines, of existing upgrades and of pipeline technology for future upgrades of turbines and lastly, the divestment of two test facilities as well as a large number of R&D engineers.[237]

The *GE/Alstom* decision presents the most comprehensive analysis of innovation competition in the Commission's decisional practice up to the *Dow/DuPont* decision. The analysis shifts from competition between parallel R&D lines (pipeline – to – pipeline innovation competition), towards future innovative activities arguable protected by maintaining a minimum number of firms capable of engaging in R&D, protecting innovation competition not only by looking at current innovation activities, but by undertaking a more forward-looking approach and assessing the incentives of the merging parties and competitors, examining whether or not there is an overall reduction of innovative efforts in the affected industry, taking into consideration specialized assets.

3.3. The Dow / DuPont decision

Although in the *Dow/DuPont* decision concerns also arose out of product and price competition, the focus of this analysis will be the Commission's examination of innovation competition.

In order to understand the competitive concerns expressed by the Commission it is necessary to start with a short analysis of the characteristics of the crop protection industry. Crop protection products (pesticides) are used in agriculture to protect crops from certain pests that can affect its development. Pesticides can be categorised in herbicides, fungicides and insecticides. The key components of crop protection products are active substances, or active ingredients which produce the desired biological effect (that is, killing the pest or making it inoffensive).[238] The discovery of a given AI starts with an R&D company's discovery and development. The global cost of advancing a discovery target into a downstream crop protection product amounts to $286 million and the lead time is approximately 11 years. Approval and authorisation of crop protection products is heavily regulated in the EU and is governed by Regulation 1107.[239] The regulatory requirements resulted not only in higher costs of authorisation, but also led to the disappearance of several products (which could not get regulatory approval for renewal), less AI's and a lesser focus of companies on the European Market. In the EU two types of approval are necessary, at EU level and at individual Member State level.[240]

An essential point of the Commission's analysis was its finding of only five R&D-integrated players (the Big 5), it found these companies alone present in all stages of the value chain (discovery, development, mixture / formulation and commercialisation).[241] These companies are Dow, DuPont, Syngenta, Bayer and BASF. Other crop protection players like Monsanto, FMC, Isagro, generic

[236] *Ibid*. at par.1078.
[237] *Ibid*. at par. 1959-1961.
[238] European Commission decision 27 March 2017, Case M.7932 (*Dow / DuPont*), par. 152.
[239] Regulation (EC) No 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC, OJ L 309, 24.11.2009.
[240] European Commission decision 27 March 2017, Case M.7932 (*Dow / DuPont*), par. 181.
[241] *Ibid*. at par. 222, 241-244.

players and Japanese companies were heavily discounted. With regard to innovation competition, the Commission focussed on innovation at two levels.

First, the Commission took the position that to be able to assess innovation competition, this required the identification of those companies which, at an industry level, have the assets and capabilities to discover and develop new products which, as a result of R&D effort, can be brought to the market.[242]

Second, the Commission focussed on innovation spaces. These spaces can be best understood as innovation potentials detached from product markets. The Commission argued that the R&D-integrated players do not innovate for all the product markets composing the entire crop protection industry at the same time and that they also do not innovate randomly without targeting specific spaces within that industry. When setting up their innovation capabilities and conducting their research, R&D players have specific discovery targets.[243] This discovery target was said to be based on lead crop and pests and thus compromises AI's that can be used in several downstream crop protection products.

Innovation spaces were considered broader than product markets but nonetheless small due to regulatory hurdles which require crop protection products to be more selective. The Commission also distinguished between lines of research, which comprise the set of scientists, patents, assets, equipment and chemical class(es) which are dedicated to a given discovery target whose final output are successive pipeline AIs targeting a given innovation space, early pipeline products, that is, products which are intermediate results of lines of research, which have already been selected among leads, but with a lower likelihood of success than development products and still in the discovery or predevelopment stage and pipeline products in the development stage whose likelihood of being successfully launched is between 80 to 90%.[244]

The Commission, in reliance of paragraphs 8, 24 and 38 of the HMGs held that the legal framework is applicable to innovation competition, and that it has to assess whether the transaction reduces important constraints on one or more sellers and significantly impede effective innovation competition. Essentially, it considered that the market features of the crop protection industry suggest that rivalry is an important factor driving innovation, and that a merger between important rival innovators is likely to lead to a reduction in innovation.[245] This assumption was grounded on the following factors:

1. Individual crop protection product markets are contestable on the basis of innovation;
2. Given the strong IPRs in the protection industry, the original innovator can be expected to reap the benefits from its innovation, by preventing rivals from imitating the successful innovation (that is, appropriability is high);
3. Innovation is mostly based on product innovation;
4. Consolidation between rival innovators is unlikely to be associated with efficiencies;
5. The fear of cannibalisation of own existing products is a disincentive to innovate which is likely to be reinforced by a merger between rival innovators.[246]

The first aspect of the Commission's assessment regarded the market features of the crop protection industry, it suggested that a merger between innovation competitors will likely result in a decreased incentive to innovate. The merging parties argued that innovation was not driven by competition, but by biological resistance (pests become resistant to certain AI's over time) and regulation. Although these factors may be relevant, the Commission indicated that these factors are

[242] *Ibid*. at par. 349.
[243] *Ibid*. at par. 350.
[244] *Ibid*. at par. 1959-1960.
[245] *Ibid*. at par. 2000.
[246] *Ibid*. at par. 2001.

not affected by the transaction and rivalry is (it might have been relevant when looking at the appreciability of the change in innovation incentives).

The downward effects on innovation due to cannibalisation was key in the Commission's assessment, as an innovation by a merging party now cannibalises profits of the merging partner firm and that these effect are internalised with the merger, adding to the opportunity cost of innovation and thus depressing the innovation incentive.[247] The following features of the crop protection industry provided by the Commission were described to support its conclusion that competition is a significant factor driving in innovation;

1. Markets are contestable and customers are not locked in. Hence, a merger between two out of a limited number of firms would lower contestability as the rivalry between those two parties is lost, thereby reducing innovation incentives;[248]
2. The industry is characterised by strong IPRs. In the HMG one of the positive effects of a merger between two rival innovators is that it can increase may increase firms' ability and incentive to bring new innovations to the market. However, investigation showed that the R&D companies can extend the protection of their products and thus, appropriability would not extend to such a level that it was deemed sufficient to offset the loss of rivalry between Dow and DuPont;[249]
3. Innovation in the crop protection industry relates mostly to product innovation. In process innovation a merger might enable such innovations to apply over a larger scale and thus provide a countervailing effect. The Commission found that this was efficiency was not applicable to product innovation.[250]

An important element of the Commission's analysis, and a divergence of its previous decisional practice, is the assessment of cannibalisation effects. This divergence possible resulted due to the parties' argument that biological resistance and regulation is the main driver of innovation. The Commission rebutted this argument by stating that these elements were not relevant for the assessment, because an innovative chemical that is in the initial stages of its development now will in the future be diverting sales from related AIs that may be further advanced in the development pipeline but have not yet been commercialised.[251] Hence, AIs targeting the same pest could be diverting sales from potential innovations.

The Commission continued its assessment by examining past concentrations and its effects on innovation competition. Investigation showed that the number of R&D-integrated companies in the crop protection industry dropped from 51 to 6 (including Isagro). Simultaneously, it found that there was a reduction in R&D expenditure despite rising costs to bring novel AIs to the market, suggesting a causal link between consolidation and a reduction in innovation effort.[252] The parties argued that the reduction of novel AI's introduced in the EU (from 41 to 12 in between 1980 and 2014) was not due to consolidation, but due to increasing R&D costs, difficulties in finding truly novel AIs, the effect of technological innovations and stringent regulation.[253] Although the Commission considered this partly relevant, it tracked decreases in innovation output and R&D spend to significant increases in EBITDA and argued that restriction of innovation output has been profitable.[254] It concluded its

[247] *Ibid*. at par. 2043.
[248] *Ibid*. at par. 2052 -2055.
[249] *Ibid*. at par. 2056-2064.
[250] *Ibid*. at par. 2066-2067.
[251] *Ibid*. at par. 2119.
[252] *Ibid*. at par. 2125.
[253] It is interesting that although the Commission severely downplayed the argument of the parties regarding decreased innovation out due to stringent regulation, a clear majority of customers and competitors deemed this the most important reason.
[254] *Ibid*. at par. 2144-2145.

analysis on past concentrations that evidence gathered does "*at the very least not offer any evidence that R&D expenditure and innovative output has increased following past consolidation*."[255]

In order to assess innovation competition, the Commission looked at concentration levels at industry level and innovation spaces. Companies compete in these spaces through lines of research which generate early pipeline products. In that respect innovation was not considered a market on its own, but as an input activity for the upstream technology market and the downstream product market.

The Commission did not only identify the players who have the assets and capabilities to discover and develop new products to the market, but also those spaces in which innovation competition occurs to assess whether post-merger innovation competition could be significantly impeded.[256] To analyse these possible effects the Commission examined specific innovation spaces where the parties had overlapping lines of research and early pipeline products. It found that not all of the R&D-integrated players were present at each innovation space. This finding was critical in the Commission's analysis. Presumably, a five to four merger is in itself not a great matter of concern. However, due to its finding of high concentration levels at innovation spaces, the disappearance of one competitor lead to tighter oligopolistic markets.

The Commission assessed concentration levels in innovation spaces by examining market sales in a given segment; it considered a player active in one market for formulated products if its market share is above 2%. The fact that in a given market for formulated products not all the R&D-integrated players are active provided the Commission a first strong indication that not all the R&D-integrated players are able, and have the incentive to innovate for a space that comprises products targeting that particular market.[257] It essentially transposed its results of R&D-integrated players active in a market for formulated products to innovation spaces to assess the likeliness that it would be developing innovation efforts aiming at introducing new products in downstream markets for formulated products in some innovation spaces. This difference between industry level and certain innovation spaces was the result of the low value of revenues associated to each crop / pest combination in the EEA, differentiated innovation assets and capabilities, capacity limitations and cooperation between R&D players (in areas where the players had agreements with a competitor it was deemed unlikely that they would target that certain area due to jeopardising the relationship with the other party).[258]

The parties held that other companies active in crop protection are capable of competing on innovation, thus arguing against the concentration levels mentioned by the Commission. However, although the Commission considered firms besides the R&D-integrated players being active in some stages of the innovation process, its investigation showed that they do not have the capabilities to engage in all the stages of innovation, or lacked the incentives to do so. To bolster its case the Commission discounted the following competitors: Monsanto, Isagro, FMC and Japanese Companies.

Monsanto's AI Glyphosate was introduced to the market more than thirty years ago and still the core of its crop protection revenues, its key strategy is related towards crop protection-seed combinations. It was therefore a distant innovation competitor to the R&D-integrated players. FMC was absent in the discovery stage and thus missed the integrated R&D capabilities at a comparable level to the R&D-integrated players and therefore was considered a distant innovation competitor. Although having brought new crop protection products to the market, Isagro did so in co-development. Lastly, the Commission analysed the innovation potential of Japanese companies. Due to a different geographical focus (i.e. the companies' focus was on the Japanese agricultural market targeting domestic crop and pest combinations), lower global turnover and R&D expenditure, non-availability of development assets in Europe, lack of regulatory expertise and dependency on one of

[255] *Ibid*. at par. 2158.
[256] *Ibid*. at par. 2163-2164.
[257] *Ibid*. at par. 2356.
[258] *Ibid*. at par. 2365-2393.

the R&D-integrated players(through co-development) the Commission considered Japanese companies distant innovation competitors.[259]

In light of these findings, and reviewing patent applications, the Commission found that the R&D-integrated players owned more than 70-80% of the patent applications, resulting in a 1000-1500 HHI, suggesting a concentrated industry structure.[260] Dow's herbicides patent share for new active ingredients was in the range of 30-40%, Syngenta's patent share in the range of 20-30%, Bayer's patent share in the range of 10-20 to 20-30%, and DuPont's patent share in the range of 5-10 to 10-20%.[261] Furthermore, a number of large agrochemical companies have a significant level of common shareholding, this led the Commission to the conclusion that innovation competition should be less intense as compared to an industry with no common shareholding.[262]

The Commission found that the transaction would bring together two competitors which pre-transaction were more important innovation competitors at industry level than their downstream market shares and their R&D expenditure shares suggest. To arrive at this conclusion it conducted an analysis of patent data, and specifically of patent citations (citations accumulated by a patent) which the Commission considered a good measure of a patents quality or technological significance.

It focussed on the period between 2000-2015, excluding mixtures[263], on the number of external citations that a patent received and the number of total citations.[264] A further segmentation was made on the basis of quality, namely, top 10%, top 25% and top 50 % patents. The parties objected to this segmentation, stating that it would exclude 90% of the patents (that is when the focus is solely on the top 10%) however, the Commission deemed this segmentation more informative of the parties' innovative strength.

In herbicides, the post-merger entity would have a patent share in the range of 40-50% to 50-60%.[265] With respect to insecticides, the post-merger entity would have a patent share in the range of 50-60% to 60-70%.[266] Finally, in fungicides, the post-merger entity would have a patent share in the range of 20-30%. Thus, post-transaction the merged entity would be a clear number one in herbicides and insecticides, and a clear number two in fungicides.[267]

This analysis led the Commission to the conclusion that Dow and DuPont have been important innovators in the crop protection industry for the discovery of new AIs and post-merger would have significant patent shares particularly in herbicides and insecticides.[268] By examining patent citations, the Commission found that in herbicides and insecticides Dow and DuPont were close competitors. By taking into account the commercial success of AIs introduced by Dow and DuPont the Commission examined firms' shares of 2015 downstream turnover of products that include AIs recently developed and launched, i.e. those introduced during 2006-2015.[269] The investigation showed that DuPont accounted for 30-40 % of the 2015 global turnover and Dow for 5-10%, resulting in a 2000-2500 post-transaction HHI level.[270] Even these shares were considered underestimating the parties' innovative strength due to several high promising pipeline products.[271]

To capture the extent to which Dow and DuPont exerted competitive pressure on each other the Commission focussed on the closeness of competition in a number of innovation spaces. It considered concrete cases in the past which showed that the parties innovated to take away share

[259] *Ibid*. at section 8.6.3.4.
[260] *Ibid*. at par. 2324.
[261] *Ibid*. at par. 2236.
[262] *Ibid*. at section 8.6.4.
[263] *Ibid*. at par. 2430-2433.
[264] *Ibid.* at par. 2436.
[265] *Ibid*. at par. 2517.
[266] *Ibid*. at par. 2533.
[267] For a more detailed overview see page 424-426.
[268] *Ibid*. at par. 2568.
[269] *Ibid*. at par. 2569-2572.
[270] *Ibid*. at par. 2574-2575.
[271] *Ibid*. at par. 2578.

from each other. Post-transaction, this competition is not present anymore which would likely result in harm to innovation. Simultaneously, the Commission focussed on overlapping lines of research and early pipeline products at risk being discontinued, deferred or redirected post-transaction.[272]

Several examples were provided by the Commission (for instance Dow's Arylex and DuPont's SUs, both herbicides) to show that Dow and DuPont competed closely for innovation in certain herbicide classes and more importantly, competed specifically against each other.[273]

It then examined parties' current pipeline products (of this section it is difficult to provide a comprehensive overview due to heavy redaction). Against these competing pipeline products the Commission found that few alternatives to the parties' lines of research and early pipeline products were available.[274] The analysis of herbicide pipeline products from competitors that may reach the market beyond 2022 also confirmed that none of them had the potential to pose a serious threat to the market position of the merging parties in Europe.[275] The Commission's investigation provided similar results in insecticides and fungicides.

Having examined lines of research and early pipeline products, the Commission continued with examining the incentives of the parties' to reduce these innovation efforts, thus leading to a significant impediment to effective innovation competition in the innovation spaces where the parties currently competed.[276]

It referred to economic theory suggesting that a merger bringing together two competing early pipeline products (or lines of research) or an early pipeline product (or line of research) positioned to compete with an existing product may lead to a reduction on the efforts to continue with those overlapping early pipeline products (or lines of research).[277] This was considered possible if the early pipeline product (or line of research) of one of the merging parties was likely to capture significant revenues from the competing product of the other merging party (be it another early pipeline product – or line of research - or products currently marketed).[278]

Consumer harm would result from both the loss of product variety and of future product market competition in markets where the discontinued / deferred or redirected early pipeline products would have been introduced but for the merger, not only in the short term (existing pipeline products or lines of research) but also over time in relation to any future R&D efforts.

Again, the Commission considered the cannibalisation effects significant, both on existing lines of research as future innovation (discovery). This cannibalisation effect would, as reasoned by the Commission, likely reduce the incentives for the merged entity to continue both lines of research and early pipeline products.[279] For innovation spaces where both the parties had overlapping lines of research and early pipeline products the merged entity was considered to have fewer incentives to put the same level of effort on innovation as the parties would independently put, but for the transaction (including the incentives to advance early pipeline products from discovery to development).

Given the closeness of innovation competition in certain innovation spaces, the Commission took the position that it was able to make an educated guess which lines of research or early pipeline products were candidates for a likely reduction of innovation effort, although it was not able to identify precisely which would be discontinued, deferred or redirected.[280] The Commission concluded its analysis of innovation spaces by stating that "*given that the Parties are close competitors for most of their current lines of research and early pipeline products it is likely that the*

[272] *Ibid*. at par. 2600-2603.
[273] *Ibid*. at par. 2606-2638.
[274] *Ibid*. at section 8.8.1.6.
[275] *Ibid*. at par. 2700.
[276] *Ibid*. at section 8.9.
[277] *Ibid*. at par. 3017.
[278] *Ibid*. at par. 3018.
[279] *Ibid*. at par. 3020-3022.
[280] *Ibid*. at par. 3025.

reduction of innovation efforts by the Parties would significantly affect a large number of innovation spaces, and accordingly significantly reduce effective innovation competition in such innovation spaces".[281]

The Commission considered that in a highly concentrated innovation-driven industry with very high barriers to entry, the internalisation of the effects of innovation competition between the parties of a merger between important innovators would likely lead to noticeable reductions in the innovation efforts of the parties in relation to any future products that would otherwise be introduced in the absence of the transaction.[282]

The first theory of harm was the discontinuation of overlapping lines of research and early pipeline products which target the same innovation spaces (a short-term effect). The second theory of harm the Commission investigated was a reduction in the overall innovation efforts and outputs year after year in the industry (a long-term structural effect).[283] These incentives could manifest themselves in less innovation efforts and lower innovation output targets, and ultimately less innovation. Essentially, the Commission did not only protect parallel R&D, but was also concerned with the general innovation incentives of the parties.

By examination of the decision it is clear that the most compelling piece of evidence was found in post-integration planning documents. It became known that the parties argued towards investors that they aimed for a $1.3 billion cost savings in the agricultural part of the business and $0.5 growth synergies in agriculture.

Countervailing reaction of innovation competitors were deemed insufficient to offset this loss of innovation output. This was due to capacity constraints, the limited amount of R&D-integrated players, prioritisation, the past-consolidation evidence which showed an absence of countervailing reactions of competitors, the fact that non-merging parties stand to benefit from the direct reduction of competition between the merging parties and therefore do not face incentives to collectively offset it, differentiated innovation assets and capabilities, common shareholding, benchmarking and lastly the unlikeliness that competitors would increase their R&D investment levels.

Dow and DuPont failed to prove or substantiate their efficiency claims. Two claims were deemed merger specific; efficiencies in R&D (removal of duplicative assets and using R&D assets more efficiently) and combining complementary strengths in R&D.

The Commission concluded its examination of innovation competition and provided the following theories of harm:

1. Immediate reduction of incentives to continue with existing lines of research and early pipeline products (either by curtailing, re-orientating or deferring). This is case of early pipeline products and lines of research that are likely to capture significant revenues from the competing product of the other Party (be it another early pipeline product or a current product). This adverse externality is internalised post-Transaction, making it more likely that the early pipeline product or line of research would be suppressed. Consumers would be harmed in this case by both the loss of product variety, and the reduced intensity of future product market competition in the markets where the discontinued, deferred or redirected product would have been introduced but for the Transaction. Although the consumer harm would only be directly felt in the future, when this product would have been introduced in the market, it would result of a short term reduction of innovation effort by the merged entity translated in the immediate discontinuity, deferment or redirection of an early pipeline product;
2. Reduction of incentives to develop in the longer term the same number of new products as the combined targets of the Parties absent the Transaction. By internalising the

[281] *Ibid*. at par. 3053.
[282] *Ibid*. at par. 3055.
[283] *Ibid*. at par. 3058.

> impact of innovation competition between the Parties, the Transaction by merging two significant and close innovators would also lead to lower innovation efforts, in relation to products that have not yet been discovered at the time of the Transaction. This would harm consumers both by reducing future product variety and future product market competition in markets where the Parties would have innovated but for the Transaction.[284]

In light of the foregoing, the Commission considered that the transaction would likely significantly impede effective competition in innovation, both in innovation spaces where the parties lines of research and early pipeline products overlap, and overall in innovation in the crop protection industry.[285]

As regards to the remedies imposed, the Commission found that the divestiture of the global R&D division of DuPont enabled a purchaser to replace DuPont as a global, fully R&D-integrated competitor in the crop protection industry, thus maintaining the rivalry with Dow's R&D activities that would otherwise have been eliminated by the transaction.[286] The divestiture included all of DuPont's assets and personnel dedicated to the discovery of new AIs as well as all patents, know-how and any other IP owned by DuPont related to its global R&D organisation and crop protection pipeline, replicating the role of DuPont in crop protection innovation.[287]

3.4. The European Commission's Novel Approach

Having examined the Commission's decisional practice and comparing this to the *Dow/DuPont* decision several novelties can be distilled which will be discussed in turn, after a short recap of the status quo.

The Commission throughout the years has become more sophisticated in its analysis of innovation competition and extended its scope. In cases of parallel R&D, the Commission is concerned (especially in the pharmaceutical sector) with a possible discontinuation of one of the R&D lines and in several cases this led to a divestment of a R&D unit. Moreover, it is clear that innovation concerns arose not only in relation to structural concerns but instead took centre stage.

The biggest developments in the decisional practice of the Commission came through the *Alstom* and *Deutsche Börse* decisions, in which the notion of innovation spaces was introduced, long-term innovation effects were examined and the Commission developed an approach in which innovation competitors are defined by the necessary R&D resources and capabilities (specialized assets), implying that a certain amount of R&D-integrated players is necessary to ensure effective innovation competition.

The Commission has taken the position that the *Dow/DuPont* decision does not contain novelties, and that it is in line with the *Alstom* and *Deutsche Börse* decision.[288] Although the Commission is right by stating that it has indeed assessed a more forward-looking concern that merging parties would reduce in the future their overall innovation effort, its dismissal of novelty can only be justified in part.

As explained in section 2.2, EU competition law is essentially static. In merger control, a SIEC can be established to the requisite legal standard if the Commission can show that the sources of competitive pressure to which the parties are subject would be significantly weakened by the transaction. Meaning, the impact of a proposed merger on the different parameters of competition can be established by proxy, that is, by examination of the particularities of the relevant market and

[284] *Ibid*. at par. 3285.
[285] *Ibid*. at par. 3297.
[286] *Ibid*. at par. 4032.
[287] *Ibid* at par. 4033.
[288] *Merger Brief 2017*, issue 2, http://ec.europa.eu/competition/publications/cmb/2017/kdal17002enn.pdf.

the position of the parties therein.[289] If investigation shows that in the relevant market innovation is the most important parameter of competition (contrasted to for example price-competition), it would be against the very logic of EU competition law enforcement to not take this into consideration. In merger control proceedings, the creation or strengthening of a dominant position is deemed sufficient to intervene. The negative effects on innovation are in that way more or less a by-product which the Commission uses to bolster its case.

The case-law of the Courts of the EU show that if the Commission is able to establish to the requisite legal standard that firms are not subjected to effective competitive constraints, the quantification of the effects on the different parameters on competition are not necessary. In the *Ryanair / Aer Lingus* case, the parties argued before the GC that the Commission did not substantiate its claim regarding harm to consumers.[290] However, the proposed transaction would give rise to a monopolistic, quasi monopolistic structure and this fact was deemed by the GC sufficient in itself to validate the analysis of the Commission finding that the implementation of the transaction should be declared incompatible with the common market.[291]

In *Deutsche Börse,* the Commission established that in several identified markets the parties competed primarily, and in one case exclusively, on product innovation and technology, process and market design. Hence, innovation considerations were analysed with respect to the observable competitive restraints at the time of intervention in the identified relevant markets. The proposed transaction would have resulted in quasi-monopolistic structures in several markets, which in itself, is sufficient to justify intervention, after all, competitive harm was (presumably) established. These structural concerns itself validated intervention.

The *Alstom* decision contained an extensive and sophisticated analysis of innovation competition. It was however examined specifically by referring to a downstream product market. Moreover, the harm to innovation was identified towards specific identified R&D lines and products. This stands in stark contrast with the competitive harm described in the *Dow/DuPont* decision. An interesting development was the assessment of specialized assets. Long-term innovation effects cannot be caught easily merely by examining current R&D lines and therefore the Commission examined innovation competitors by referring to resources and capabilities necessary for conducting R&D.[292] The concern being that by combining two out of a small number of firms with specialized assets, future product innovation will diminish.

Thus, although the Commission has rightly taken the position that the *Alstom* and *Deutsche Börse* decision laid the groundwork for the detailed assessment of innovation competition, the dismissal of novelty seems unfounded. The following paragraphs set out identified novelties and compare this to the state of play preceding the *Dow/DuPont* decision.

The first novelty is that the Commission did not rely on the definition of the relevant market in its assessment of innovation competition. This stands in stark contrast with previous decisional practice in which innovation competition was examined by referring to R&D directed to specific product markets (be it current or future). In fact, the Commission specifically took the position that innovation should not be considered a market on its own, but rather an input for the upstream technology market and downstream product market.[293]

Instead of defining the relevant market, the Commission focussed on innovation competition in innovation spaces, being the overlaps between the parties' lines of research and early pipeline products as well as between lines of research and early pipeline products of a party that will compete in a market where the other party is an existing or potential supplier. At industry level, the

[289] Colomo (cit. ft. 6).
[290] General Court 6 July 2010, Case T-342 / 07 (*Ryanair Holdings PLC v European Commission*).
[291] European Commission decision 1 February 2012, Case No COMP / M.6166 (*Deutsche Börse / NYSE Euronext*), par. 384.
[292] In the *Dow/DuPont* decision the Commission spoke of R&D-integrated players, in the *Alstom* decision of full technology competitors.
[293] European Commission decision 27 March 2017, Case M.7932 (*Dow / DuPont*), par. 348.

Commission focussed on the overlap between the parties' respective global R&D organisations, meaning the resources, personnel, facilities, and other tangible and intangible assets dedicated to research, development and registration of new active ingredients.[294]

The analysis of innovation spaces is a significant development of the Commission's decisional practice. Innovation spaces are broader than individual downstream product markets but do not encompass all the product markets in an industry and can be best understood as innovation potentials for which companies compete in a given industry (discovery targets). These R&D activities cannot yet be assigned to concrete (future) products or are not specifically observable. This approach enables the Commission to assess early R&D activities, extending the timeframe of the prospective analysis. In the *Dow/DuPont* decision, innovation spaces were linked to overlapping lines of research and early pipeline products in herbicides, insecticides and fungicides. The delineation of innovation spaces was presumably critical in the Commission's analysis due to high concentration levels. Indeed, when looking at innovation competition in the crop protection industry, the result was a five to four merger (if one follows the Commission's observation that the relevant competitor excludes non R&D-integrated players). However, by investigating innovation spaces, the Commission found higher concentration levels given that not all of the R&D-integrated players were found active in every of those spaces, resulting in a more problematic three to two merger.[295]

Innovation spaces, and the assessment of innovation competition encompassing broader product markets was introduced in the *Deutsche Börse* decision and therefore not entirely novel.[296] The validation of this approach by the GC and the subsequent use of it in the *Dow/DuPont* decision, do seem to imply that the Commission will not be hesitant to apply this framework in upcoming merger control proceedings.[297]

A second novelty is found in the assessment of cannibalisation effects. This unilateral effect, unstated in the HMG, can be found in several innovation related merger decisions. However, previous decisional practice took these effects into account with regard to existing products. In the *Dow/DuPont* decision, the Commission specifically stated that the assessment of innovation competition extends cannibalisation effects to future products, arguing that innovative products of one firm may divert sales and profits from both existing and other innovative future products of rival firms.[298]

The third 'novelty' relates to the Commission's reasoning that to ensure effective innovation competition several independent R&D-integrated firms are necessary, meaning, companies active in the entire innovation process. In the *Dow/DuPont* decision the Commission found that only five companies were fully integrated R&D players capable of discovery and development in the crop protection industry. The remedy, the sale of the global R&D division of DuPont, was particularly designed to enable a purchaser to replace DuPont as a global R&D-integrated competitor.[299] This resembles the approach taken in the *Alstom* decision were the Commission found that, by examining R&D capabilities, only four players were deemed innovation competitors.[300] This long-term innovation analysis goes beyond the protection of existing R&D poles (as future, unknown innovation activities are protected) and has important consequences for merging parties in R&D-intensive industries. As seen in the *Alstom* and *Dow/DuPont* decision, this analysis led to a far-reaching remedy, i.e. the divestiture of a (large part of) global R&D division.

The justification of the placement of the previous paragraph in the novelty section, since the Commission used a similar approach in the *Alstom* decision (hence the word three is placed in

[294] *Ibid*. at par. 1957.
[295] *Ibid*. at par. 2353-2395.
[296] European Commission decision 1 February 2012, Case No COMP / M.6166 (*Deutsche Börse / NYSE Euronext*), par. 635, 640 and 923.
[297] General Court 9 March 2015, Case T-175 / 12 (*Deutsche Börse AG v European Commission)*.
[298] European Commission decision 27 March 2017, Case M.7932 (*Dow / DuPont*), par. 2108 and 2119.
[299] *Ibid*. at par. 4032.
[300] European Commission decision 8 September 2015, Case M.7278 (*General Electric / Alstom*), par. 229.

quotation marks), lies in the fact that the former concerns the divestment of assets for upgrades to existing products (nevertheless protecting unknown innovation activities), while the latter is entirely detached from any existing product market, highlighting the more abstract innovation competition concerns.

The fourth novelty is the assessment of innovation market shares. In previous decisions the Commission focussed on R&D expenditure. However, in the *Dow/DuPont* decision it assessed on measures of innovation output.[301] To analyse the parties' strength at discovery level, the Commission assessed the companies' patent portfolio, measuring the strength of patents by using external patent citations.[302] In addition, the Commission used new AIs shares to assess the capability of firms to develop an AI on a large scale and to distribute it to enable its commercial success on the market. [303] These metrics were utilized by the Commission to show that focussing solely on R&D expenditure would downplay Dow and DuPont's importance as innovation competitor in the crop protection industry.

The last novelty derived from the decision can be found in paragraph 3025 of the decision.[304] In the merger decisions examined in section 3.2, the Commission identified the R&D lines to be discontinued. For example, in *Pfizer/Hospira* the Commission identified Pfizer's infliximab biosimilar drug, in *GSK/Novartis* the focus was on the MEK and B-Raf inhibitor and in *GE/Alstom,* Alstom's 50 Hz HDGTs technology and related R&D. In the *Dow/DuPont* decision on the other hand, the Commission noted that it "*may not be able to identify precisely which early pipeline products or lines of research the Parties would likely discontinue, defer or re-direct*."[305]

Notwithstanding the fact that the developments are indeed novelties in the Commission's assessment of innovation competition, these changes to do not constitute radical departure of previous decisional practice.

First, the Commission applied the standard unilateral effects framework. In Annex 4 of the *Dow/DuPont* decision (the Annex which sets out the economic framework) the Commission takes the position that a merger in innovative industries generates standard unilateral effects. Its main position is that a merger between two out of a limited number of innovators is likely to reduce competition in innovation, and limiting the overall rate of innovation.[306] Pre-merger, the parties would have competed with each other to take sales from the other party through the introduction of new and innovative products. Post-merger, this effect is internalised within the merging entity and the innovation incentives are diminished due to expected cannibalisation effects.[307]

Second, the Commission reviewed specific evidence and industry specifics one could expect in a merger review not necessarily related to innovation competition; closeness of competition, evidence from past concentrations and market structure (concentration levels, barriers to entry).

The phrase which catches the essence of the *Dow/DuPont* decision is 'new wine in old bottles'. Several aspects are certainly novel and constitute a divergence of previous decisional practice. On the other hand, the examination of standard unilateral effects and structural concerns remain the focal point of the Commission's assessment.

It is obvious that the biggest concern of the Commission with regard to the proposed transaction was the amount of AIs developed and put on the market in the EEA. This can be easily derived by examining closely section 8.5 of the decision.[308] It cites markets respondents expecting a decrease in innovation effort and stating the lack of effective solutions for several crop / pests combinations.[309]

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[301] European Commission decision 27 March 2017, Case M.7932 (*Dow / DuPont*), section 5.2.
[302] *Ibid*. at par. 2436.
[303] *Ibid*. at section 8.7.2.2.
[304] *Ibid*. at par 3025.
[305] *Ibid.*
[306] *Ibid*., Annex 4, par. 40.
[307] *Ibid*., Annex 4, par. 41.
[308] *Ibid*. at section 8.5.
[309] *Ibid*. at par. 2135-2137.

Furthermore, it explicitly mentions in section 8.5.2. that innovation effort and output have decreased with particular incidence in the EEA, and that "*this negative trend in innovation in the crop protection industry has particularly affected the EEA, industry sources document that European crop protection markets are less and less the primary target of R&D expenditure by industry players*."[310] Simultaneously, R&D investment dropped from one third to less than 10 % in the period between 1980 and 2012.[311] The Commission derived out of these facts that any further reduction of competition on innovation would significantly affect European markets[312] and took this into account as an aggravating factor.[313]

The application of the merger rules thus lied in market design, leaning towards sector regulation, with one desired outcome, maximisation of innovation output. EU competition law is best equipped (and most comfortable), as seen in the *Deutsche Börse* decision, to tackle these issues applying the static framework. The entire analysis is steered towards market power, and its negative externalisation on innovation competition. The actual end-result was the fragmentation of innovation market power through the divestment of DuPont's entire global R&D division, upholding the equivalent of R&D-integrated firms pre-merger which, in the eyes of the Commission, is beneficial for innovation output.

3.5. The Gradual Evolution of the European Commission's Decisional Practice

The assessment of innovation competition has long been part of the Commission's decisional practice and throughout the years the Commission has become more sophisticated in its analysis thereof but more importantly, extended its scope. Hence, it would be incorrect to state that the analysis of innovation competition contemplated in the *Dow/DuPont* decision came out of the blue, examination of previous merger decisions signal a gradual evolution of decisional practice.

As seen in section 3.2, merger decisions involving parallel R&D show that the Commission is willing to look deeper into companies' pipeline and the notion of observable competitive constraints is applied rather loosely. Simultaneously, these decisions involve a lesser focus on structural concerns and touch upon innovation itself, protecting a (possible) valuable asset. Through the introduction of the concept of innovation spaces the Commission is able to assess early R&D activities, i.e. discovery targets (thus broader than downstream product markets) over which firms compete without having to define a narrow product market. It's finding of these spaces was essential towards the Commission's competitive assessment given the higher levels of concentration found, compared to the industry wide level. This development, created by the Commission, expanded the scope of EU merger control, and more importantly, its application has the potential of not being limited to the crop protection industry, with the most obvious example being the pharmaceutical industry.

The terminology used by the Commission in which it advances its second theory of harm in the *Dow/DuPont* decision, namely innovation competition at industry level, gave rise to several authors speaking of a quantum leap of the Commission's decisional practice.[314] This is an overstatement of facts, but this confusion can largely be attributed on the Commission given the somewhat unlucky wording. Essentially, the long-term theory of harm entails that the combined entity would have less incentives to innovate due to the loss of competitive pressure, and given the fact that only three other firms were considered present in all stages of innovation, combined with the existence of high entry barriers, the Commission concluded that the merger would lead to a SIEC at industry level.

While it is true that, in the literal sense, the Commission has not examined the effects of a merger on innovation competition at industry level, the analysis of long-term innovation effects has

[310] *Ibid.* at par. 2138.
[311] *Ibid.* at par. 2140.
[312] *Ibid.* at par. 2142.
[313] *Ibid.* at par. 2158.
[314] Petit (cit. ft. 89).

long been present in the Commission's decisional practice. In the *Deutsche Börse* decision the effect of the merger on innovation competition resulted from structural concerns, namely, the merger would have resulted in quasi-monopolistic structures in several markets.[315] In the *Alstom* decision, a long-term perspective about the innovation effects was also considered.[316] Even earlier cases touched upon these issues. In the *Glaxo Wellcome/ SmithKline Beecham* decision, the effects of the merger on R&D markets were accompanied by an assessment of the impact on the overall R&D potential in the industry.[317]

An important observation of the *Dow/DuPont* decision is that although the wording innovation competition at industry level seems to imply that the merger also lowers the incentives of the remaining firms to innovate (as was the case in the *Alstom* decision) the theory of harm considers the innovative output of the merging firms. The Commission argues that the efforts of players with discovery capabilities and of players with development capability would not offset the reduction of output resulting from the transaction.[318] Although one could say that this analysis is essentially crystal ball gazing, the theory of harm concerns the lessening of innovation incentives due to increased market power. In that respect, the analysis falls perfectly within the structural approach, specified towards R&D (increased concentration levels combined with a lessening of R&D, while simultaneously the industry itself is in the eyes of the Commission not susceptible to change).

Notwithstanding the conclusion that the *Dow/DuPont* decision is in line with previous decisional practice, several novelties are considerable. The Commission explicitly did not rely on the relevant market. Admittedly, although it is part of the long understanding of EU competition law that the market definition is not an end in itself but rather an instrument for competitive assessments, the reliance of the Commission on market definition is equally part of this understanding. Not only is it repeated throughout the HMG that the Commission relies on this definition for its competitive assessment, the GC recently held that; "*a proper definition of the relevant market is a necessary precondition for any assessment of the effect of a concentration on competition*".[319] The fact that the Commission assessed innovation competition by reference to R&D, unspecified towards current or future product markets, is a big development in EU merger control. This brings us back to the legal framework, and to the question whether or not the EU merger control framework is up to date.

3.6. The Need for a Revision of the Horizontal Merger Guidelines

The previous section highlighted the evolution of the Commission's decisional practice. This evolution raises important questions of legal certainty. In what ways do the HMG and the EUMR reflect this expansion of EU merger control? In this section it will be argued that in the interest of clarity and legal certainty, the EU merger control framework should be revised as to accurately represent the development of merger policy.

In section 3.1, it was provided that, looking at the HMG, the Commission can apply the legal framework towards the assessment of innovation competition. Moreover, in the Tetra Laval judgement the ECJ indicated that; "*The prospective analysis consists of an examination of how a concentration might alter the factors determining the state of competition on a given market in order to establish whether it would give rise to a serious impediment to effective competition.*"[320] Hence, the prospective analysis is not limited towards the assessment of static parameters, but equally encompasses innovation. Surprisingly, this is not specified in the EUMR, although the notion of SIEC

[315] European Commission decision 1 February 2012, Case No COMP / M.6166 (*Deutsche Börse / NYSE Euronext*).
[316] European Commission decision 8 September 2015, Case M.7278 (*General Electric / Alstom*).
[317] European Commission decision 8 May 2000, Case COMP / M.1846 (*Glaxo Wellcome / SmithKline Beecham*).
[318] European Commission decision 27 March 2017, Case M.7932 (*Dow / DuPont*), section 8.10.6.
[319] General Court 26 October 2017, Case T-394/15 (*KPN BV v European Commission)*, par. 60.
[320] European Court of Justice 15 February 2005, Case C-12 / 03 P (*Commission of the European Communities / Tetra Laval BV),* par. 42.

does provide the Commission with sufficient flexibility to take innovation considerations into account.[321]

The standard of proof required of a prospective analysis in relation to innovation competition was extensively debated in the *Tetra Laval* judgement, but unfortunately, the ECJ failed to provide guidance on the application, and its limits thereof, of the legal framework towards the assessment of this particular parameter of competition.[322] This equally applies to the judgement of the GC in the *Deutsche Börse* decision*,* in its lengthy decision the examination of the applicability of the EUMR and HMG towards innovation competition is largely absent.[323]

The HMG do recognize innovation, and specifically as an important factor in the competitive process. However, it fails to adequately provide the method of the assessment regarding the effects of a merger on innovation. More specifically, the limited guidance is two-sided. Paragraph 38 of the HMG states a negative and a positive effect that could arise through a merger. The HMG state that on the one hand, a merger might increase firms' ability and incentive to bring new innovations to the market and, thereby, the competitive pressure on rivals to innovate, while on the other hand, it states that effective competition may be significantly impeded by a merger between two important innovators.[324]

Applicability of the HMG towards innovation competition is in no way controversial (and for that matter undesirable), but still, the arguments of the Commission in the *Dow/DuPont* decision towards the extension of its scope are unsatisfactory given the framework as it is.

For example, take the Commission's argument that the assessment of a merger between two companies with pipeline products related to a specific product market is only one example of how harm to innovation competition may occur. In the eyes of the Commission this is clear following the wording of paragraph 38 of the HMG, which state: "*Alternatively, effective competition may be significantly impeded by a merger between two important innovators, <u>for instance</u> between two companies with 'pipeline' products related to a specific product market* (emphasis added)."[325] Notwithstanding the correctness of the observation, it is reasonable to argue that the Commission interpreted the HMG quite liberally (especially when one considers previous decisional practice).

What follows from the previous paragraphs is that the decisional practice of the Commission evolved to a certain point that the HMG do not accurately reflect these developments. In light of the importance of legal certainty in merger control proceedings it would therefore be important to consider a revision of the HMG.[326] In that respect it should be brought to remembrance that it is long-standing case-law that the Commission may lay down for itself guidelines for the exercise of its discretionary powers by way of documents such as guidelines, provided that they contain directions on the approach to be followed by that institution and do not depart from the Treaty rules.[327] This equally applies to the discretionary power to revise soft-law instruments.

Although it not the object of this thesis, and neither in its scope, to fully provide a detailed assessment of such revision, several points can from the outset be taken into consideration. These are: a clear definition of innovation spaces, a description of the main innovative concerns and the possible inclusion of dynamic efficiencies.

An important inclusion in the possible revised HMG is an actual definition of innovation spaces. Companies set specific discovery targets and, in the *Dow/ DuPont* decision this was linked to crop /

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[321] See Section 3.1.

[322] European Court of Justice 15 February 2005, Case C-12 / 03 P (*Commission of the European Communities / Tetra Laval BV)*.

[323] General Court 9 March 2015, Case T-175 / 12 (*Deutsche Börse AG v European Commission)*.

[324] Guidelines on the assessment of horizontal mergers under the council regulation on the control of concentrations between undertakings, OJ C31, 5 February 2004, par. 38.

[325] *Ibid*.

[326] Paragraph 6 of the HMG states that: "*The Commission may revise this notice from time to time in the light of future developments*".

[327] See for example: General Court 5 November 1997, Case T-149/95 (*Ducros* v. *Commission*), par. 61

pest combinations, compete for these specific targets with their R&D. The innovation spaces are thus defined by research targeting a specific solution to a problem and not by defining specific pipeline developments. Questions remain about the precise delineation of these spaces which are broader than individual downstream product markets. The framework is flexible enough to be applied in upcoming merger proceedings and should be clarified.

A second inclusion could be a description of the main innovation concerns and the analytical framework in the assessment thereof (the reason for this inclusions is that although 'just another' parameter of competition, innovation is in no way similar compared to other static parameters). The HMG refer to innovation sporadically, applicability towards innovation competition is more or less someone can, in hindsight, read into it. The main innovation concerns in the *Dow/DuPont* decision related to the immediate discontinuation, deferment or redirection of competing lines of research and early pipeline products and a reduction of incentives to develop in the longer term the same number of new products as the combined targets of the arties absent the merger.[328] This description of the curtailment of innovative efforts is closely aligned with the U.S. Horizontal Merger Guidelines,[329] with the difference being that the latter describes these effects in some detail.[330] To equally include these concerns in the HMG would be a welcome development.

A last point to discuss is the possible inclusion of dynamic efficiencies in the HMG. Innovation relates to dynamic efficiencies, contrasted with so-called static efficiencies. With regard to the latter, one should make a distinction between allocative and productive efficiencies. In a static competitive environment, firms will try to operate at lowest cost (productive efficiency) while simultaneously utilizing the limited resources most efficiently (allocative efficiency).[331] Dynamic efficiencies on the other hand, can be seen as a kind of efficiency gains that occur over time, and as such cannot be reaped at a single point of time.[332] These efficiencies, which relate to innovation, are deemed to occur over a longer time horizon.

Under the efficiency regime of EU merger control the burden of proof is on the merging parties, which will need to show that: the efficiencies benefit consumers (in a timely matter), are merger-specific and are verifiable.[333]

The requirement of timeliness, which the Commission interprets as a two to four year timeframe[334], makes stating claims of dynamic efficiencies a close to impossible task for merging

[328] In that respect it is important to note that one of the main reasons the Commission advocates that the merging parties in the *Dow/DuPont* merger will have fewer innovation incentives is a consequence of cannibalisation effects, which are unstated in the HMG.

[329] The Commission explicitly aligns the innovation concerns with those set out in the U.S. Horizontal Merger Guidelines, see: European Commission decision 27 March 2017, Case M.7932 (*Dow / DuPont)*, ft. 1523.

[330] U.S. Department of Justice and Federal Trade Commission, Horizontal Merger Guidelines (2010). In section 6.4 it is stated that: *the possibility of curtailment of innovative efforts which could take the form of reduced incentive to continue with an existing product-development effort or reduced incentive to initiate development of new products*". Furthermore, the Guidelines indicate that: "*The first of these effects is most likely to occur if at least one of the merging firms is engaging in efforts to introduce new products that would capture substantial revenues from the other merging firm. The second, longer-run effect is most likely to occur if at least one of the merging firms has capabilities that are likely to lead it to develop new products in the future that would capture substantial revenues from the other merging firm. The Agencies therefore also consider whether a merger will diminish innovation competition by combining two of a very small number of firms with the strongest capabilities to successfully innovate in a specific direction*".

[331] I. Graef & Y. Sih & P. Valcke, 'How Google and others upset competition analysis: disruptive innovation and European competition law', Paper for 25th European Regional Conference of the International Telecommunications Society 2014.

[332] Laskowska (cit. ft. 7).

[333] Guidelines on the assessment of horizontal mergers under the council regulation on the control of concentrations between undertakings, OJ C31, 5 February 2004, paragraph 78.

[334] Haucap (cit. ft. 14).

parties.[335] Moreover, the Commission assesses innovation on the notion of unquantifiable incentives. In this setting it is difficult to quantify improved innovation prospects and second, to prove up to the requisite legal standard how this offsets the unquantifiable reduction in innovation efforts.[336]

Notwithstanding the practical difficulties encompassing the inclusion of dynamic efficiencies, recent developments of the Commission's decisional practice do call for such inclusion. Although the argued harm to innovation competition is the result of a reduction in the R&D-budget (short-term), the presumed harm to consumers would manifest itself in a ten to fifteen year time horizon.[337] The requirement of timeliness thus creates a structural imbalance, meaning, efficiencies have to materialise quickly post-merger, compared to the harm to competition and innovation, which can occur in the distant future.[338]

4. CONCLUSION

This thesis attempted to address in a systematic way the Commission's overall approach in the assessment of innovation competition in merger control proceedings. In light of the modern economy, it is understandable and desirable that the focus on innovation in EU competition law has become increasingly important. This growing awareness of the importance of innovation is reflected in the gradual evolution of the Commission's decisional practice.

The *Dow/DuPont* decision shows that the Commission is willing to extend the scope of its analysis to address the presumed impact of a merger on innovation competition. This thesis argued that this level of extension and sophistication is not reflected in the legal framework, and careful consideration should be given towards a revision of the HMG. One the other hand, the *Dow/DuPont* decision does not constitute a radical departure of previous decisional practice. To a certain extent the analysis fits perfectly with previous administrative enforcement, notwithstanding the fact that several novelties do break on some level with the *status quo*. Post-merger abandonment of parallel R&D lines remains a key area of concern. The more long-term analysis corresponds to the structural approach, specified towards R&D (increased concentration levels combined with a lessening of R&D, while simultaneously the industry itself is in the eyes of the Commission not susceptible to change). Essentially the Commission transposed the unilateral effects analysis, accompanied by the traditional toolbox of evidence reviewed, towards the assessment of innovation competition.

Consequently, the *Dow/DuPont* decision highlights the necessity of further discussion for the appropriate standard of enforcement policy regarding innovation competition in light of the shortcomings of the structural approach. Assuming anticompetitive effects on innovation from increased concentration, while pro-competitive effects are largely disregarded is an inadequate basis for enforcement policy.[339] As Katz and Shelanski noted:

"Innovation can dramatically affect the relationship between the pre-merger marketplace and what is likely to happen if the proposed merger is consummated. This requires consideration of how innovation will affect the evolution of market structure and competition. Innovation is a force that could make static measures of market structure unreliable or irrelevant, and the effects of innovation

[335] Paragraph 83 of the HMG indicates that:" *In general, the later the efficiencies are expected to materialise in the future, the less weight the Commission can assign to them. This implies that, in order to be considered as a counteracting factor, the efficiencies must be timely*".
[336] Lofaro & Lewis & Abecasis (cit. ft. 82).
[337] European Commission decision 27 March 2017, Case M.7932 (*Dow / DuPont)*, par. 2032-2034.
[338] Haucap (cit. ft. 309).
[339] Conick (cit. ft. 60).

may be highly relevant to whether a merger should be challenged and to the kind of remedy antitrust authorities choose to adopt."[340]

Further research is necessary to develop an understanding how EU merger control can truly integrate innovation considerations in the existing legal framework. Making predictions of innovation incentives and the impact of innovation on the development of the market structure is difficult task indeed. However what we do know is that the relationship between innovation and concentration levels remains unresolved, which should be the starting point of each analysis and more importantly, such an analysis should include a general presumption that innovation incentives do not solely arise out of market power.

A major difficulty is finding the correct balance in enforcement. Under-enforcement can lead to long-term weakening of innovation competition in certain markets. On the other hand, this equally applies to over-enforcement. The Commission should therefore thread with caution and seek to establish a framework which incorporates an appropriate counterfactual. In such a framework, one cannot discount the advantages of larger firms size and firm concentration, i.e. enhanced appropriability, better access to finance, economies of scale and combining complementary resources.[341] This entails that the Commission could consider dynamic efficiencies in its competitive assessment as part of an overall trade-off, hence conducting its analysis on differential gains and losses instead of seeking a competitive equilibrium. However, prior to the establishment of such a framework which, if one looks at the deep embedment in the static application of EU competition law, is not to be expected in the short-term, priority should be given towards a revision of the HMG as to accurately reflect the evolution of merger policy.

[340] M.L. Katz & H.A. Shelanski, 'Merger Policy and Innovation: Must Enforcement Change to Account for Technological Change?', in: A.B. Jaffe & J. Lerner & S. Stern, *Innovation Policy and the Economy*, Cambridge: The MIT Press 2005.

[341] W. Kerber, 'Competition, Innovation and Maintaining Diversity through Competition Law', in: J. Drexl & W. Kerber & R. Podszun, *Competition Policy and the Economic Approach: Foundations and Limitations*, Cheltenham: Edward Elgar Pub 2011.

List of abbreviations

Active ingredients	AIs
Department of Justice	DoJ
Deutsche Börse	DB
Drug-Coated Balloons	DCBs
European Commission	Commission
European Court of Justice	ECJ
European Merger Regulation	EUMR
European Union	EU
General Court of the European Union	GC
General Electric	GE
Glaxo Wellcome	GW
Heavy Duty Gas Turbines	HDGTs
Herfindahl-Hirschman Index	HHI
Horizontal Merger Guidelines	HMG
Intellectual Property Rights	IPRs
New York Stock Exchange Euronext	NYX
Original Equipment Manufacturers	OEM
Research & Development	R&D
Significant Impediment of Effective Competition	SIEC
Smithkline Beecham	SB
Treaty on the Functioning of the European Union	TFEU

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