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INNOVATION MARKETS, FUTURE MARKETS, OR POTENTIAL COMPETITION: HOW SHOULD COMPETITION AUTHORITIES ACCOUNT FOR INNOVATION COMPETITION IN MERGER REVIEWS?

*Benjamin R. Kern**

ABSTRACT

The relevant competitors in regard to innovation might, but not necessarily do, correspond to the identified competitors on actual product markets. Hence, the conventional analysis of product markets, in order to assess the potential anticompetitive effects of mergers, is insufficient to capture innovation competition in its full extent. As a consequence, the aim of this article is to introduce and compare the existing alternative approaches which can, in principle, be used for the assessment of anticompetitive innovation effects in merger review. By focusing on the applied U.S. Antitrust, it turns out that none of the existing approaches seems to be appropriate to fully account for innovation competition. However, the 'Innovation Market Analysis', the first framework especially designed for the assessment of innovation aspects, might still serve as a good starting point for the development of a revised assessment framework.

JEL: B52; K21; L12; L41; O31

I. INTRODUCTION

It is relatively undisputed that innovation is of outstanding relevance for consumers and society.[1] When Joseph Schumpeter articulated his idea of "creative destruction" at the beginning of the 1940s, he also laid the theoretical cornerstone for the recognition of competition as an important driver for innovation.[2] Thus, from this perspective it is only coherent that also competition authorities account for this source of economic growth and consumer welfare. However, despite the fact there is a broad consensus among lawyers and economists on the enormous importance of innovation, it is still controversially debated how exactly innovation should be taken into account.

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1 *See* Robert M. Solow, *Technical Change and the Aggregate Production Function*, 39 REV. ECON. STAT. 312 (1957); EDWARD F. DENISON, TRENDS IN AMERICAN ECONOMIC GROWTH, 1929-1982 (Brookings Institution 1985); Edward M. Graham, *Technological Innovation and the Dynamics of the U.S. Comparative Advantage in International Trade, in* TECHNOLOGICAL INNOVATION FOR A DYNAMIC ECONOMY 118 (Christopher T. Hill & James M. Utterback eds., Pergamon Press 1979).

2 *See* JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM AND DEMOCRACY (Harper 1942).

This equally applies to merger review, where competition authorities traditionally tend to focus on the assessment of competition on relevant product markets.[3] Hereby, the relevant firms which compete with one another are identified and possible anticompetitive effects get revealed. But, in contrast to competition with prices, quantities or product quality, competition with respect to innovation is not necessarily tied to existing product markets.[4] The idea behind this argument relates to the question whether the firms who compete in regard to existing products necessarily play a role in regard to innovation competition? Or, by asking the opposite, whether there are perhaps additional firms (by also accounting for firms outside the current product market) that actually compete with one another in regard to innovation? How should antitrust authorities account for instance for mergers between firms that are fierce competitors with respect to innovation, but do not have any products at all (or at least do not compete with one another on any product market) at the time of the merger? Will the agencies not inevitably run the risk of an either too restrictive or a too permissive merger review, if they narrow the analysis of innovation effects on the assessment of current product market competition?

Assume for example a situation in which two current product market competitors merge. The number of firms which is indeed undertaking R&D in a particular field (or would in principle be able to undertake R&D on the basis of the required resources like patents, research laboratories, experience *etc.*) might differ significantly from the number of firms, currently active on the relevant product market. Hence, although the assessment of product markets as a device to identify the relevant competitors is a well founded step in order to protect static price and non-price competition, the sole assessment of the respective product market will most likely not reflect the true competitive situation in regard to innovation competition. The same holds true for the counterexample. Competition authorities might find that a certain product market is highly concentrated. However, by also accounting for innovation competitors outside the current product market (*e.g.* firms that are well situated to undertake R&D in a particular field or firms that are already undertaking R&D) the merger might appear less anticompetitive, at least in respect to innovation. Furthermore, one can also think of situations, which are a mixture of both settings. The number of relevant competitors with respect to innovation can be much lower than the number of competitors on the actual product market which might raise concerns with respect to anticompetitive innovation effects.

[3] *See* Richard J. Gilbert & Steven C. Sunshine, *Incorporating Dynamic Efficiency Concerns in Merger Analysis: The Use of Innovation Markets*, 63 ANTITRUST L.J. 569, at 572 *et seq.* (1995).

[4] *Id*. at 581 *et seq*.; Michael Katz & Howard Shelanski, *Mergers and Innovation*, 74 ANTITRUST L.J. 1, at 18 *et seq*. (2007); Josef Drexl, *Anti-Competitive Stumbling Stones on the Way to a Cleaner World: Protecting Competition in Innovation without a Market*, 8 J. COMP. L. & ECON. 507, at 513 *et seq*. (2012).

But, considerations for additional innovation competitors outside the current product market could relax the authorities' concerns. Moreover, one can think of situations in which antitrust authorities have to assess a merger in which the respondents are not competing with one another on any product market at that time. Hence, in such a setting, product market analysis will not reveal any anticompetitive doubts. But these firms might still be fierce competitors in regard to innovation.

It is remarkable that this dimension of competition is indeed considered in the 2010 'U.S. Horizontal Merger Guidelines'[5], as well as in the 'European Guidelines on Horizontal Cooperation Agreements.[6] However, what is currently missing is a clear approach to how the agencies should actually implement the objective of a consideration of innovation competition in merger review. In order to give legal guidance and to reduce legal uncertainty, the consideration of innovation competition would require an approach that goes beyond the conventional analysis of actual product markets and that, in addition, relies on a consistent theory of harm.

Part II of this article reviews the (existing) approaches which can generally be used for the assessment of anticompetitive effects on innovation in merger control. In Part III these approaches are explored through exemplary merger cases. Since the debate on these approaches was taking place primarily in the U.S. and due to the fact that only the U.S. antitrust agencies have applied the whole spectrum of these approaches, the examples are taken from mergers analyzed by the Department of Justice (DoJ) and the Federal Trade Commission (FTC). Part IV offers a critical assessment of the introduced approaches and examples. In this connection the chapter explicitly considers the question whether the approaches are equally effective with respect to the consideration of innovation competition. Part V draws implications of the precedent assessment for the consideration of innovation competition in merger review. Part VI concludes by summarizing the results of the comparative analysis and listing four key components which could function as the basic structure for the development of a revised framework for the assessment of innovation competition.

[5] *See* U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES § 6.4 (Aug. 19, 2010).

[6] Communication From the Commission: Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Cooperation Agreements, 2011 O.J. (C 11) 1, ¶¶ 119-22. *See also* Drexl, *supra* note 4, at 508.

II. APPROACHES FOR THE CONSIDERATION OF INNOVATION COMPETITION IN MERGER REVIEW

A. The Potential Competition Doctrine

Before the applicability of the 'Potential Competition Doctrine' for the protection of innovation competition will be assessed, it is necessary to consider the economic theory behind this concept. The basic idea of 'Potential Competition' was already expressed by John Bates Clark at the very beginning of the 20th century.[7] In his article 'the real dangers of the trusts' he highlighted 'the saving grace' of 'Potential Competition' by means of "the competition of the mill that is not yet built but will be built if the trust becomes too extortionate".[8] Hence, the original idea of 'Potential Competition' was that even under imperfect competition already the perceived threat for market entry has a disciplining effect on the incumbent firms which prevents them from (fully) exploiting their market power. Since then, a lot of scholars like Joe Bain[9] or William Baumol, John Panzar and Robert Willig[10] have contributed to further develop the concept of 'Potential Competition'. In the applied U.S. merger review this (original) feature of 'Potential Competition' is widely understood as 'Perceived Potential Competition'[11] which is supposed to have a 'tempering effect' on the non-competitive conduct of the incumbent firms.[12] As a consequence, a 'Perceived Potential Competitor' has to be seen as a firm which might actually never enter the market because its sole existence already induces the incumbent firms to behave in a way that makes market entry unprofitable. Therefore, the loss of a 'Perceived Potential Competitor' will not change actual or future market structure, but could enable the incumbent firms to (fully) exploit their market power.

However, in addition to the perceived threat of potential market entry, there also exists 'Potential Competition' by means of an expected *de facto* entry. Hence, the loss of such a 'Potential Competitor' can be understood as a preclusion of "later independent entry that

7 *See* John B. Clark, *The Real Dangers of the Trusts*, 68 THE CENTURY MAGAZINE 954 (1904).

8 *Id*. at 955.

9 *See* JOE S. BAIN, BARRIERS TO NEW COMPETITION (Harvard University Press 1956). This idea is captured particularly well in the 'limit pricing' models, in which incumbent firms refrain from fully exploiting their market power in order to deter market entry.

10 *See* WILLIAM J. BAUMOL, JOHN C. PANZAR & ROBERT D. WILLIG, CONTESTABLE MARKETS AND THE THEORY OF INDUSTRY STRUCTURE (Harcourt Brace Jovanovich, Inc. 1982). The concept of "contestable markets" can be understood as a benchmark case, in which no market entry- and exit barriers exist, making "hit and run" market entry possible.

11 *See* United States v. Falstaff Brewing Corp., 410 U.S. 526 (1973); 5 PHILLIP E. AREEDA & DONALD F. TURNER, ANTITRUST LAW, ¶ 1116(a) (1980); FED. TRADE COMM'N, OFFICE OF POLICY PLANNING, ANTICIPATING THE 21 ST CENTURY: COMPETITION POLICY IN THE NEW HIGH-TECH, GLOBAL MARKETPLACE ch. 7, at 11 *et seq*. (May 1996), *available at* http://www.ftc.gov/opp/global/report/gc_v1.pdf (Aug. 20, 2013) [hereinafter GLOBAL MARKETPLACE REPORT].

12 *See* United States v. Marine Bancorporation, Inc., 418 U.S. 602 (1974); United States v. Siemens Corp., 621 F.2d 499 (1980).

would have added an additional competitor to the market."[13] As a consequence and in contrast to the idea of 'Perceived Potential Competition', which merely deals with the disciplining effects of a market entry threat, this feature of 'Potential Competition' accounts for the "loss of competitive benefits from actual entry that would probably be realized in the future".[14] As a result, those firms which are expected to enter a particular market in the (near) future are widely regarded as 'Actual Potential Competitors'.[15]

1. 'Perceived Potential Competition' and Innovation

The idea of 'Perceived Potential Competition' in regard to innovation was most suitable captured by Richard Gilbert and David Newbery in 1982.[16] In their model they have shown that even a monopoly could have strong incentives to innovate in order to achieve pre-emptive patents with the final goal to protect its market position. Hence, the concept of 'Perceived Potential Competition' might, in principle, be well suited to account for the incumbent firms' incentives to innovate as a consequence of a perceived threat of market entry or a menacing 'replacement effect'.[17] However, it is exactly this component which likewise limits the approach's ability to account for innovation competition. First, a firm cannot be regarded as a 'Perceived Potential Competitor' once it is already an active competitor on the respective product market. As a consequence, the concept of 'Perceived Potential Competition' cannot deal with innovation competition by means of a refinement of current product market competition aiming to identify those competitors that effectively play a role with respect to innovation. Second, since a 'Perceived Potential Competitor' has solely a disciplining effect on the incumbent firms' incentives to innovate, there will appear an additional problem. Once the competition authorities observe that a firm outside an existing product market is actually undertaking R&D in order to enter this market, it is questionable whether this firm can still be regarded as a 'Perceived Potential Competitor'.

2. 'Actual Potential Competition' and Innovation

This problem disappears if competition authorities apply the concept of 'Actual Potential Competition'. A particular firm, which is undertaking R&D in order to enter a certain product

[13] Areeda & Turner, *supra* note 11 ¶ 1116(a).
[14] William A. Alper, *Potential Competition: An Idea whose Time has Passed*, 50 BROOKLYN L. REV. 407, at 409 (1984).
[15] *See* Areeda & Turner, *supra* note 11, ¶ 1116(a); GLOBAL MARKETPLACE REPORT, *supra* note 11, at 10 *et seq.*
[16] *See* Richard J. Gilbert & David M.G. Newbery, *Preemptive Patenting and the Persistence of Monopoly*, 72 AM. ECON. REV. 514 (1982).
[17] *See* Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources to Invention*, *in* THE RATE AND DIRECTION OF ECONOMIC ACTIVITY 609 (Richard R. Nelson ed., Princeton University Press 1962).

market, can be considered as an 'Actual Potential Competitor', if the respective market entry is likely and contemporary.[18] Hence, the potential entrant does not only augment the incumbent firms' incentives to innovate like in the previous case, but she is also undertaking R&D herself. However, the concept of 'Actual Potential Competition' is inevitably linked to already existing product markets. As soon as competition authorities want to account for R&D which is directed towards innovations for which no product markets exists by then, the concept turns out to be insufficient. Hence, the 'Potential Competition Doctrine' can solely account for situations in which the respective firm is at the fringe of an actual product market, but it fails to capture innovation competition for those kinds of innovations that are expected to constitute a new relevant product market. As a consequence, competition authorities have to figure out whether the 'Potential Competitor' has to be seen as a future competitor on a current product market or not. If the R&D efforts are supposed to result in a product which is expected to be in the same relevant product market, the concept of 'Actual Potential Competition' can account for this aspect of innovation. However, if the R&D efforts are expected to constitute an entirely new product market, it would be difficult to speak of a market entry and therefore to apply the concept of 'Actual Potential Competition'.

However, if the incumbent firm and the firm outside the current product market are equally undertaking R&D in order to develop products which are supposed to constitute a new product market, there is a positive likelihood that these products will actually compete against one another in the future. Hence, the 'Potential Competition Doctrine' might still be applied via some sort of an extension of the original concept.

B. The 'Future Market' approach

The idea of 'Future Markets' can be understood as the necessary extension of the 'Potential Competition Doctrine' in order to literally account for 'potential' (or possible) competition which might take place on a future product market that does not exist so far.[19] Hence, even though neither of the firms can in fact be seen as an incumbent nor as an entrant into an existing product market, the idea of 'Future Markets' is to allow for the consideration of potential product market competition on a particular good market in the future. Thus, even

[18] *See* Areeda & Turner, *supra* note 11, ¶ 1116(a); Alper, *supra* note 14, at 407 *et seq*.; GLOBAL MARKETPLACE REPORT, *supra* note 11, at 10 *et seq*.

[19] *See* William F. Baxter, *The Definition and Measurement of Market Power in Industries Characterized by Rapidly Developing and Changing Technologies*, 53 ANTITRUST L.J. 717 (1985); Lawrence B. Landman, *The Economics of Future Goods Markets*, 21 W. Comp. L. & Econ. Rev. 63 (1997); John T. Lang, *European Community Antitrust Law: Innovation Markets and High Technology Industries*, 20 FORDHAM INT'L. L. J. 717 (1997); Lawrence B. Landman, *Innovation and the Structure of Competition: Future Markets in European and American Law*, 81 J. PAT. & TRADEMARK OFF. SOC'Y 728, 789, 838 (1999).

though innovation competition is actually not the central issue of the 'Future Market' approach, it might still consider for innovation in an implicit manner, by protecting future product market competition. It is notable that, in contrast to the 'Potential Competition Doctrine', it is furthermore irrelevant whether the firms, which are considered as 'Future Market' competitors, are currently competing with one another on the same actual product market, or not. As a consequence, 'Future Markets' do not only solve the problem that the 'Potential Competition Doctrine' can actually account solely for market entry into already existing product markets, 'Future Markets' do also allow for considerations of innovation competition independent of the respective firms' role on current product markets. However, as in regard to the concept of 'Actual Potential Competition', 'Future Markets' require R&D efforts to be 'observable'. If these efforts cannot be identified it would be impossible to determine whether a particular firm is planning to enter an existing market and should therefore be considered as an 'Actual Potential Competitor'. Likewise it would be impossible to define whether the firms' R&D might constitute an entirely new market so that they should be regarded as 'Future Market' competitors.

However, there is also another possible interpretation of the idea of the 'Future Market' approach. Instead of the protection of static price and non-price competition on a future product market, the concept can also be understood as an approach in order to protect the emergence of a particular product market in the future.[20] Hence, in contrast to the prior mentioned protection of product market competition in the future, the concept could, from this point of view, also be applied to mergers in which the creation of a future market is at stake. It is remarkable that, under this notion of the 'Future Market' approach, competition authorities can even account for innovation competition, although the parties might never compete with one another on the respective product market in the future. This could be the case, if *e.g.* the R&D efforts of one of the merging firms are expected to create a new product market which will replace, or at least negatively affect, an existing product of the other firm. Hence, even though the two firms might never compete with one another on the same relevant product market, there is still a reasonable risk that the introduction of the new product might be abandoned, or delayed, as a consequence of the merger. As a result, under this interpretation of the approach, the agencies would be able to account for innovation absent any requirements about the protection of static efficiencies on actual or future product markets.

[20] *See* Lang, *supra* note 19, at 760 *et seq*.

C. The 'Innovation Market Analysis'

The 'Innovation Market Analysis' (IMA) was introduced by Richard Gilbert and Steven Sunshine in 1995.[21] It was the first attempt to develop a framework especially for the consideration of anticompetitive innovation effects in merger review. Thus, the 'Innovation Market Analysis' can also be understood as an analytical tool in order to enable the antitrust authorities to account for innovation competition, independently or absent of current product markets. Hereby, the authors proposed a 5-step-framework to analyze the innovation effects of M&A transactions in the following way:

In a first step, it should be analyzed whether the R&D activities of the merging parties overlap. Hence, only substitutive research efforts which go in the same 'direction' – or, put in other words, try to find solutions for the same problem, are analysed in more detail, whereas complementary or independent fields of research were not deemed as problematic.

In a second step, the authorities are urged to investigate the existence and extent of alternative sources for innovation. Thus, in contrast to the conventional assessment of current product markets, the 'IMA' tries to identify directly the firms that compete with one another in regard to innovation. This step is the virtual novelty in comparison to traditional approaches. As a consequence, the authors proposed the analysis of necessary resources in form of specialized assets to assess whether a particular firm is part of a certain 'Innovation Market', or not. Such specialized assets can be *e.g.* especially trained staff, experience and know-how or intellectual property rights.

In the following steps 3 and 4, it shall be assessed whether the merged entities would have the capabilities and the incentives to reduce their R&D activities through either unilateral or coordinated behaviour, or whether other competitors would render such strategies as either not feasible or not profitable. This represents the analysis of the potential anticompetitive effects in regard to innovation competition, and focuses explicitly on the impact of the merger upon the incentives to invest in R&D.

In the last step of their 'Innovation Market Analysis' (step 5), Gilbert and Sunshine reminded that it shall be analyzed whether an expected reduction in R&D investments through the merger could be defended through an innovation-related efficiency defense.[22]

As a result, one can sum up that this step-by-step procedure resembles very much the conventional way of assessing mergers in U.S. antitrust, as well as in E.U. competition law. However, the 'IMA' actually did not focus on competition on a real 'market'. Instead, by

[21] *See* Gilbert & Sunshine, *supra* note 3.

[22] *See also* Oliver E. Williamson, *Economics as an Anti-Trust Defense: The Welfare Trade-Offs*, 58 AM. ECON. REV. 18 (1968).

identifying innovation competitors detached from product markets, it intended to focus on competition with the action parameter R&D/innovation.[23]

III. EXEMPLARY MERGER CASES

A. 'Potential Competition' Cases

In fact, there is a bunch of merger cases in which the U.S. antitrust authorities protected innovation on the basis of the 'Actual Potential Competition Doctrine'. One example is the merger between Hoechst and Marion Merrell Dow in 1995.[24] Hereby the agency defined four relevant markets: The "research, development, manufacture, and sale of: (1) Once-a-day diltiazem, [...] (2) Oral dosage forms of mesalamine, [...] (3) Rifampin, [...] and (4) FDA approved drugs for the treatment of intermittent claudication".[25] In all of these markets either Hoechst or Marion Merrell Dow was an incumbent firm, while the other was engaged in R&D aiming to enter this market.[26] Therefore, the acquisition would likely have eliminated an 'Actual Potential Competitor' on each of these markets. This induced the agency to demand the divestiture of essential assets in order to "ensure continued competition".[27]

In *Astra/Zeneca* one can find a very similar setting.[28] The FTC defined the relevant market as the "manufacture and sale of Long-Acting Local Anesthetics"[29] and alleged that Astra was one of only two companies that already marketed products with FDA approval while Zeneca was engaged in R&D through a licensing agreement with Chiroscience.[30] As a consequence, the merger would have eliminated an 'Actual Potential Competitor' as in the previous case and the FTC likewise remedied the potential anticompetitive effects via divestitures.

Hence, even though these 'Potential Competition' cases actually focused on the anticompetitive effects on existing product markets, the agencies also protected innovation in an implicit manner. The crucial point is that one of the merging parties was already active on the respective product market while the other one was conducting R&D in order to enter this market. As a consequence of the merger, there was a reasonable risk that market entry would not take place and future competition was likely to be lessened.

[23] *See* Drexl, *supra* note 4, at 517; *See also* Wolfgang Kerber, *Competition, Innovation and Maintaining Diversity Through Competition Law*, *in* ECONOMIC APPROACHES TO COMPETITION LAW: FOUNDATIONS AND LIMITATIONS 173, at 195 *et seq*. (Josef Drexl et al. eds., Edward Elgar 2010).
[24] *See* Hoechst AG, 120 F.T.C. 1010 (1995).
[25] *Id*., at 1012.
[26] *Id*., at 1012 *et seq*.
[27] *Id*. at 1021 *et seq*.
[28] *See* Zeneca Group plc, 127 F.T.C. 874 (1999).
[29] *Id*., at 876.
[30] *Id*.

One could argue, since it might be difficult to prove whether a certain R&D program will constitute a new product market or not, that the 'Actual Potential Competition' concept could be applied to the vast majority of mergers in which R&D is 'observable'. For instance, in the merger case between Glaxo plc. and Wellcome plc., the FTC considered the "research and development of non-injectable 5HTID agonist"[31] as R&D towards a new product market, whereas the European Commission (EC) considered these research efforts as an attempt to enter an already existing market.[32] However, as already mentioned above, the concept of 'Actual Potential Competition' requires market entry to be likely and timely. Hence, there are certain limits if antitrust authorities want to protect innovation competition through the backdoor by alleging that a certain R&D program will not constitute a new market, but lessen 'Potential Competition'. This problem was expressed very well in the dissenting statement of Commissioner Owen regarding the *Roche/Genentech* decision:

> The consistent theme of case precedent and the Merger Guidelines is that before a merger will be challenged under a theory of actual potential competition, the prospective entrant must be willing and able imminently to enter a market which is not now performing competitively. In the instant case, the Commission alleged anticompetitive effect and took relief in markets where, in my judgment, there is substantial doubt that the prospective entrant is willing to enter; there is only speculation that the prospective entrant is able to enter; and/or it is certain that entry is not imminent. Moreover, there are as yet no firms or products in one market, so drawing conclusions about competitive performance in that market in the relatively distant future is speculative at best.[33]

Thus, since the agencies have to show that a particular R&D project will lead to a market entry which is both - likely and timely, the ability of the concept of 'Actual Potential Competition', to account for innovation competition, is limited. Indeed, antitrust authorities could claim that a certain R&D track will not constitute a new market and thereby rely on the well accepted 'Potential Competition Doctrine'. But, then they also have to legitimate the intervention (actually directed towards the protection of innovation competition) on the basis of the requirements for the protection of 'Potential Competition' on existing product markets.[34]

[31] Glaxo plc, 119 F.T.C. 815 (1995), at 816.
[32] *See* Glaxo/Wellcome, Case No IV/M.555 (Feb. 28, 1995), O.J.C.65 (March 16, 1995).
[33] Deborah K. Owen, *Dissenting Statement of Commissioner Owen in the matter of Roche Holding Ltd*., 113 F.T.C. 1107, 1107 *et seq*. (1990), *available at* http://www.ftc.gov/sites/default/files/documents/commission_decision_volumes/volume-113/volume113_1016-1114.pdf (Dec. 17, 2013).
[34] This might be problematic, since the benefits for consumers and society from *e.g.* a particular product innovation, which is expected to constitute a new product market, might be significantly higher than the

In contrast to the 'Actual Potential Competition' concept, one can find virtually no merger cases in which the agencies challenged a merger concerning innovation competition solely on the basis of the concept of 'Perceived Potential Competition'. One explanation for this phenomenon might be that in contrast to the idea of 'Actual Potential Competition', a 'Perceived Potential Competitor', per definition, never really intends to enter a certain market. Hence, in order to regard a 'Potential Competitor' as a 'Perceived Potential Competitor' she has to be identified via its resources (like *e.g.* patents, experience, know-how, *etc.*) which in principle would enable her to conduct R&D as a device for market entry. But, as soon as one 'observes' that she really undertakes R&D in order to enter the product market, the 'Perceived Potential Competitor' necessarily becomes an 'Actual Potential Competitor' or a 'Future Market' competitor. Thus, if particular R&D efforts can be identified, it becomes difficult to regard a firm as a 'Perceived Potential Competitor'. However, this property of the approach might also be its main advantage compared to the approaches in which R&D projects necessarily have to be 'observable'. The 'Perceived Potential Competition' concept could in principle allow the agencies to consider for all those mergers in which R&D efforts cannot be 'observed' that easily. Since R&D is often carried out under secrecy, antitrust authorities often have difficulties to determine whether a particular R&D program is directed towards existing or new product markets, or whether a particular firm is undertaking R&D at all. Nevertheless, since it is problematic to regard a firm as a 'Perceived Potential Competitor' once it is already actively competing on the relevant product market, the approach's ability to account for innovation competition is rather limited. As a result there remain very little mergers in which the 'Perceived Potential Competition' concept could generally suit to protect innovation competition.

B. 'Future Markets' and 'Innovation Markets'

This changes if competition authorities apply 'Future-' or 'Innovation Markets'. Here it does not matter whether the firms currently compete with one another on a particular product market or not. While the 'IMA' (at least in a narrow sense) did not find its way into the applied European Merger Policy, it was frequently used in the U.S., at least until the beginning of the last decade.[35] In order to provide exemplary evidence, a selection of prominent merger cases is introduced and categorized into two groups.

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benefits from having an additional competitor on an already existing product market, in terms of an increased price competition or a higher product variety.

[35] *See*, *e.g.*, Landman *supra* note 19; Lang *supra* note 19, at 760 *et seq.*; Herbert Hovenkamp, *Harm to Competition Under the 2010 Horizontal Merger Guidelines*, 39 REV. IND. ORGAN. 3, at 8 (2011).

1. 'Unobservable' R&D projects

The first group consists of merger cases in which the firms are considered as competitors in regard to innovation even though the antitrust authorities cannot definitely 'observe' whether the firms undertake R&D and/or what particular innovations they are working on. Instead, the identification of the relevant competitors is carried out by the assessment of the particular capabilities and resources (the so-called specialized assets) necessary to undertake R&D. The idea behind this procedure is that particular innovations in a certain field are assumed to require indispensable specialized assets which cannot be acquired and adopted in an adequate time. Thus, those firms that possess these critical assets are deemed as competitors in regard to particular innovations and those firms who lack these assets, are consequently not part of the relevant 'Innovation Market'. Hence, the intension pursued with respect to this group of 'Innovation Market Cases' is primarily about protecting sources for potential future innovations in a certain field.

The acquisition of General Motor's Allison Transmission Division by ZF Friedrichshafen in 1993 was the first merger that was challenged on reasoning, very similar to the idea behind the 'Innovation Market Analysis'.[36] On the first sight the case does not seem to be very exceptional, since the two companies together produced 89 percent of the world-wide output of medium and heavy automatic transmissions for commercial and military vehicles.[37] Hence, considering the world market, the merged company would have had a dominant market position. However, it is remarkable that regarding the two product markets defined in the complaint (the market for automatic transmissions for transit buses and the market for automatic transmissions for heavy refuse route trucks) the firms mainly competed with one another on the European market, but to a rather small extent on the U.S. market.[38] Nevertheless, the DoJ also raised concerns with respect to a third market, namely the "technological innovation in the design, development, and production of heavy automatic transmissions".[39] In this respect the Department of Justice alleged that competition on this world-wide 'Innovation Market' would be lessened, leading to less innovation, and that this circumstance also adversely affects consumers in the U.S.[40] Hence, the DoJ's concerns

[36] *See* United States v. General Motors Corp., Civ. No. 93-530 (complaint filed D.Del. Nov. 16, 1993).
[37] *Id*., at 2.
[38] *Id*., at 8 *et seq*. An increase of the HHI by about 1.000 points to a post-merger HHI of about 6.500 points as a consequence of the three to two merger and the fact that the merged entity would have had an aggregated market share of about 78%, indicates that ZF's share on the U.S. market for automatic transmissions for transit buses was less than 10%. Furthermore, the fact that ZF did not enter the U.S. market until 1985 also points at the limited relevance of ZF in terms of market shares, also on the market for automatic transmissions for heavy refuse route trucks.
[39] *Id*., at 10 *et seq*.
[40] *Id*.

regarding the respondents' relevance as the two major competitors on this market for next-generation products seemed to be of high importance. As a consequence of the Department's complaint, the parties abandoned the deal.

However, critics claim that innovation competition could also be protected by applying the more accepted 'Potential Competition Doctrine' instead of the 'IMA'.[41] This is questionable. Since, in this case, the research efforts were not 'observable', it would have been difficult to challenge the merger on the basis of the 'Actual Potential Competition' or on basis of the 'Future Market' concept. Hence, the only approach that would have been available in principle was the concept of 'Perceived Potential Competition'. However, since both firms were already competing with one another on the respective product market (even though to a relatively small extent in the U.S.) it is very doubtful whether the DoJ could have accounted for innovation competition on the basis of this approach. Hence, the 'Potential Competition Doctrine' seemed to be inadequate to account for innovation competition in this particular case. As a result, beside the 'traditional' considerations about dynamic efficiencies on product markets, there was no other approach in order to account for innovation competition in this merger. However, as described above, relying on dynamic efficiencies on product markets often delivers faulty results if the agencies want to account for innovation competition. Furthermore, since ZF Friedrichshafen had solely a relatively small share of the relevant U.S. product markets, it is questionable whether considerations about dynamic efficiencies would have reflected the firm's role as an important innovation competitor.

Another prominent case which one can assign to the first category of cases was the proposed acquisition of Northrop Grumman by Lockheed Martin in 1998, which also led to the abandonment of the merger.[42] In this case, the DoJ defined ten relevant markets - nine of them with innovation concerns. By examining these nine markets with innovation concerns in more detail it becomes clear that the DoJ apparently distinguished between the assessment of static efficiencies on the affected product markets and, by focussing on the possessed specialized assets, the analysis in regard to innovation competition. This becomes particularly evident by considering the Department's reasoning in regard to the market for the "development, production and sale of high performance fixed-wing military aircraft for the

[41] *See, e.g.*, Howard M. Morse, *The Limits of Innovation Markets*, 2 ANTITRUST & INTELL. PROP. (ABA SECTION OF ANTITRUST LAW NEWSL.) 22, at 27 (2001); Robert J. Hoerner, *Innovation Markets: new Wine in old Bottles?*, 64 ANTITRUST L.J. 49 (1995); George A. Hay, *Innovations in Antitrust Enforcement*, 64 ANTITRUST L.J. 7, at 14 (1995).

[42] *See* United States v. Lockheed Martin Corp., Civ. No. 98-00731 (D.D.C. complaint filed March 23, 1998).

U.S. military".[43] With respect to this market the DoJ argued that the merger would lead to less innovation (besides higher costs and higher prices), because:

> [...] Northrop, Lockheed, and Boeing do all pursue new ideas and designs for future high performance fixed-wing military aircraft to meet specific combat needs, and these firms are the only 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 produce high performance fixed-wing military aircraft from three to two.[44]

Hence, even though the two companies indeed competed on the same relevant product market, the DoJ also explicitly accounted for the necessary capabilities to develop next-generation products. Thus, by asking for the number of firms which are capable to produce innovations in the future, the DoJ applied the 'Innovation Market Analysis' (or at least an approach that shared a similar underlying idea) to directly account for the relevant innovation competitors in addition to the assessment of anticompetitive effects on the relevant product market. It is furthermore remarkable, that the DoJ explicitly highlighted the relevance of preserving at least three independent companies as potential innovators. Thus, the protection of a variety of heterogeneous firms of which each might carry unique and valuable resources for the generation of future problem solutions was apparently of high relevance in this case.[45] Hence, in contrast to the focus on future product market competition, the agency obviously tried to protect future innovation itself. Furthermore the DoJ highlighted the necessary capabilities required to pursue future innovations. Thereby, and in contrast to the sole consideration of dynamic efficiencies on actual product markets, the agency implemented the idea of an explicit consideration of innovation competition.

As a result, it is first of all remarkable that considerations about preserving a variety of heterogeneous firms as sources for future innovations apparently played an important role in quite a few cases of this category of 'unobservable' R&D projects.[46] Indeed, in the set of challenged mergers belonging to this category one can virtually find only mergers of firms which were already competing with one another on existing product markets. However, the number of competitors in regard to future innovations does not necessarily correspond to the

[43] *Id*., at 13.
[44] *Id*., at 27.
[45] *See* Daniel L. Rubinfeld & John Hoven, *Innovation and Antitrust Enforcement, in* DYNAMIC COMPETITION AND PUBLIC POLICY: TECHNOLOGY, INNOVATION, AND ANTITRUST ISSUES 65 (Jerry Ellig ed., Cambridge University Press 2001).
[46] *See also* United States v. Halliburton Co., Civ. No. 98-2340 (D.D.C. complaint filed Sept. 29. 1998); United States v. General Dynamics Corp., Civ. No. 1:01CV02200 (D.D.C. complaint filed Oct. 23, 2001).

number of current product market competitors. Hence, by accounting for specialized assets, the agencies additionally considered for innovation competition (ancillary to product market competition) that encompasses only those firms that have the necessary capabilities and resources to innovate. This number can, but not necessarily has to, correspond to the number of current product market competitors. Hence, by differentiating between product market and 'Innovation Market' competitors, the authorities might conclude that the number of relevant competitors in regard to innovation competition is higher, lower or the same as compared to the corresponding product market. This is a feature which none of the 'traditional' approaches provides. While the concepts of 'Actual Potential Competition' as well as 'Future Markets' require R&D to be 'observable', the 'Perceived Potential Competition' concept can solely account for mergers between an incumbent firm and a firm outside the current product market.

2. 'Observable' R&D projects

The second group of mergers cases consists of cases in which the firms are considered as competitors with respect to innovation because antitrust authorities are sufficiently able to 'observe' the employed R&D programs. It is remarkable that the vast majority of cases which fall into this category were concerned with pharmaceutical mergers.[47] This stems from the fact that, in comparison to other industries, it is feasible to get an impression of the distinct research programs of pharmaceutical firms. Since pharmaceutical products need to pass lengthy regulatory approval procedures, firms cannot undertake R&D under secrecy with the ulterior motive to suddenly come up with a new product.[48] Instead, antitrust authorities can get quite a good impression of the different treatments and drugs that might make it to the market within the next couple of years.

One of the first cases which fell into this category was the merger of American Home Products (AHP) and Cyanamid in 1995.[49] The Federal Trade Commission argued that the merger will affect the market for "the research and development of a vaccine against Rotavirus infections in humans".[50] Hence, the chosen market definition already indicates that

[47] *See, e.g.*, American Home Products Corp., 119 F.T.C. 217 (1995); Pfizer Inc. and Warner-Lambert Co., FTC Dkt. No. C-3957 (June 19, 2000); Baxter Int'l, Inc., 123 F.T.C. 904 (1997); Ciba-Geigy Ltd., 123 F.T.C. 842 (1997); The Upjohn, Co., 121 F.T.C. 44 (1996); Glaxo plc, 119 F.T.C. 815 (1995); Glaxo Wellcome plc, 131 F.T.C. 56 (2001).

[48] *See* Michael A. Carrier, *Two Puzzles Resolved: Of the Schumpeter-Arrow Stalemate and Pharmaceutical Markets*, 93 IOWA LAW REV. 393, at 401 (2008); Dennis W. Carlton, *Does Antitrust Need to be Modernized?*, 21 J. ECON. PERSPECT. 155, at 165 (2007).

[49] *See* American Home Products Corp., 119 F.T.C.217 (1995).

[50] *Id*., at 219.

the protection of innovation competition must have been the main concern of the Commission. A closer look at the market concentration provides additional evidence. The FTC stated that: "As of the date of this complaint, there are only three producers of vaccines with research projects either in clinical development or near clinical development aimed at developing a vaccine against Rotavirus infection in humans."[51] Since a vaccine for Rotavirus did not exist at the time of this merger (solely research projects), the Commission was unable to identify an existing product market. With respect to the alleged anticompetitive effects the FTC also stated that the acquisition may lessen competition by "eliminating actual, direct competition for research and development between AHP and Cyanamid in the Rotavirus vaccine research and development market"[52], and by "eliminating potential competition in the relevant Rotavirus vaccine research and development market".[53] Even though it is not clear what the Commission really meant by potential competition in a research and development market, it is outstanding that the FTC was primarily interested in the protection of innovation competition and that the relevant market was defined by focusing on the firms which are currently undertaking R&D in this field. Since no product market existed back then, it is evident that innovation competition could have been protected neither via the 'Actual Potential Competition' – nor via the 'Perceived Potential Competition' concept. However, basically it would have been also possible to account for innovation competition via the 'Future Market' concept.

In the case regarding the merger between Glaxo Wellcome and Smith Kline Beecham, two 'markets' can be identified as being concerned with innovation competition.[54] The market for "the research, development, manufacture and sale of prophylactic herpes vaccines", and the market for "the research, development, manufacture and sale of drugs for the treatment of IBS".[55] Although the market definition is broader as in the *AHP/Cyanamid* case (since the FTC also used the term 'manufacture and sale'), there is evidence that the FTC was strongly concerned with innovation aspects. Regarding the competitive situation on the market for prophylactic herpes vaccines the FTC stated that: "No company currently markets a prophylactic herpes vaccine."[56] Thus, the agency was apparently unable to define an existing product market for assessing the anticompetitive effects of the merger. Instead, the FTC argued that the merger may lessen competition "by increasing the likelihood that the merged

[51] *Id*., at 220.
[52] *Id*., at 221.
[53] *Id*.
[54] *See* Glaxo Wellcome plc, 131 F.T.C. 56 (2001).
[55] *Id*., at 60.
[56] *Id*., at 62.

entity would forego or delay the development of one of the prophylactic herpes vaccines or, alternatively, eliminate price competition between the two prophylactic herpes vaccines if both were introduced in the market".[57] Hence, on the one hand the Federal Trade Commission considered the possibility for negative effects on innovation competition (forego or delay the development), and on the other hand, the potential elimination of eventual price competition in the future.

The same holds true for the market for "the research, development, manufacture and sale of drugs for the treatment of IBS".[58] The FTC mentioned that: "Currently, there are no Drugs available for the treatment of irritable bowel syndrome."[59] And with respect to the anticompetitive effects of the merger the FTC stated that it may lessen competition "by increasing the likelihood that the merged entity would increase prices and reduce innovation in the market for Drugs for the treatment of IBS".[60] Since there was no marketable product at the time of the merger, the negative effects on prices can only be understood as anticompetitive price effects in the future. On the contrary, the concern that innovation will be reduced can clearly be linked to the protection of current innovation competition in regard to the development of a treatment for IBS. Hence, in this merger one can find both. On the one hand the agency highlighted the relevance of protecting future product market competition and on the other hand the FTC explicitly claimed innovation effects. As a consequence, it is not entirely clear whether the agency followed an 'Innovation Market' or a 'Future Market' approach to protect innovation competition.

Another prominent case in which the authorities accounted for innovation competition was the merger case of *Ciba-Geigy/Sandoz* in 1997.[61] Here the agency defined three relevant markets. As a consequence of the fact that this article focuses on the protection of innovation competition, the market for the "research, development, manufacture and sale of gene therapies" (in particular the HSV-tk gene therapy for the treatment of cancer and graft versus host disease, the gene therapy for the treatment of hemophilia and the chemoresistance gene therapy) is analyzed in detail.[62] The FTC described the merging parties as "two of only a few entities capable of commercially developing gene therapy products"[63], since it would be necessary to control critical intellectual property portfolios (patents and know-how), in order

[57] *Id*., at 64.
[58] *Id*., at 60.
[59] *Id*., at 63.
[60] *Id*., at 65.
[61] *See* Ciba-Geigy Ltd., 123 F.T.C. 842 (1997).
[62] *Id*., at 844 *et seq*.
[63] *Id*., at 846.

to compete on this market.[64] In regard to the expected anticompetitive effects, the agency also claimed that, the merger will "combine alternative technologies, and reduce innovation competition among researchers and developers of gene therapy products, including reduction in, delay of or redirection of research and development tracks".[65] Thus, while a 'reduction' and a 'delay' clearly correspond to innovation incentive arguments, it is not entirely clear what the FTC really meant with a 'redirection of research and development tracks'. However, it can be suggested that this warning of a redirection of research tracks is caused by the fear of an alignment of formerly different approaches and thus as an attempt to protect the diversity of different R&D paths.[66] This interpretation is supported by the discussion about the appropriate remedy. Since, in the settlement, the FTC did not require the divestiture of assets but the granting of a non-exclusive license to Rhône-Poulenc, Commissioner Azcuenaga doubted the effectiveness of the remedy for solving the anticompetitive concerns of the merger. In her statement she argued: "The diversity of research projects is an element of the pre-merger competition between Sandoz and Ciba-Geigy that is worth preserving, but the order does not ensure that it is preserved."[67]

In comparison with the FTC which sometimes remained a bit vague regarding the question whether it actually aimed to protect competition on a future product market or rather innovation competition, the European Commission focused much stronger on a 'Future Market' approach (in the sense of a protection of future price and non-price competition). This becomes evident by studying the European Commission's decision regarding the *Ciba-Geigy/Sandoz* merger.[68] With respect to the provided definition of the relevant 'Future Market' the Commission alleged:

> In the Pharmaceuticals industry, a full assessment of the competitive situation requires examination of the products which are not yet on the market but which are at an advanced stage of development […]. The potential for these products to enter into competition with other products, which are either at the development stage or already at the market, can be assessed only by

[64] *Id*.
[65] *Id*., at 851.
[66] This view clearly differs from the modern industrial organization literature in which the important characteristics of a certain affiliation (*e.g.* the business culture, experience or employees), where a particular R&D program is hosted, has almost no impact on its success. However, this implies that the parental cause which actually leads to the existence of heterogeneous projects is not captured.
[67] Mary L. Azcuenaga, *Statement of Commissioner Mary L. Azcuenaga, Concurring in Part and Dissenting in Part*, in Ciba-Geigy Ltd., 123 F.T.C. 898, at 900 (March 24, 1997), *available at* http://www.ftc.gov/sites/default/files/documents/cases/1997/04/mla.htm (Dec. 17, 2013).
[68] *See* Ciba-Geigy/Sandoz, Case No. IV/M.737 (July 17, 1996), O.J.L.201 (July 29, 1997).

> reference to their characteristics and intended therapeutic use. […] . The Commission has to look at R&D potential in terms of its importance for existing markets, but also for future markets.[69]

Moreover, in the corresponding competitive assessment the Commission states:

> 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 based precisely on such potential.[70]

Hence, although the European Commission was also concerned with research activities in the field of HS-TK gene therapy, the purpose of protection phrased in the market definition and the competitive assessment is much narrower. In contrast to the complaint of the FTC, the EC apparently aimed exclusively at the protection of future product market competition.

As a result, the introduced 2nd category demonstrated, that there can appear mergers that raise concerns with regard to innovation competition because the 'observed' research programmes overlap. Thus, there may appear reasonable concerns that the merger will lead to fewer innovations since the merged entity has less incentives to innovate and/or that the merger will lead to an alignment of R&D tracks. Furthermore, competition authorities might be concerned that competition on a particular future product market gets impeded. As a result, in principle the 'Innovation Market Analysis' as well as the 'Future Market' approach seem to be appropriate to account for innovation competition in this 2nd category of merger cases.

Furthermore, in the 1st category, we have seen that a merger might raise concerns in regard to innovation competition as a consequence of a reduction of independent entities which possess the necessary specialized assets to undertake innovations in a certain field (even though the R&D programs themselves are not 'observable'). In this respect antitrust authorities might have problems to account for innovation competition by relying solely on 'traditional' approaches like the 'Perceived Potential Competition' approach or the considerations for dynamic efficiencies on product markets. As soon as both parties are already competing with one another on the respective product market, it is difficult to apply the 'perceived potential competition' approach. Hence, besides the 'Innovation Market Analysis', it is not clear how antitrust authorities could account for innovation competition in this 1st category of merger cases.

[69] *Id*., point 42.
[70] *Id*., point 95.

IV. CRITICAL ASSESSMENT OF THE APPROACHES: STRENGTH AND WEAKNESSES

A. Overview on the Applicability of the Approaches

In the following the findings of the assessment of the approaches with respect to their suitability to consider for innovation competition are compared. Thus, table 1 gives an overview on the general applicability of the introduced approaches in order to account for innovation competition under certain settings:

Table 1. Overview on the general applicability of the distinct approaches

	the merging firms are pre-innovation competitors	the merging firms are not pre-innovation competitors
'Unobservable' R&D projects	Innovation Markets	Perceived Potential Competition; Innovation Markets
R&D is expected to constitute a new relevant product market	Future Markets; Innovation Markets	Future Markets; Innovation Markets
R&D is not expected to constitute a new relevant product market	Innovation Markets	Actual Potential Competition; Innovation Markets

Source: Author

As illustrated above, the 'Potential Competition Doctrine' can account for mergers of firms that indeed do not compete with another on current product markets but one of the parties functions as an 'Actual' or 'Perceived Potential Competitor'. Beside this, the 'Future Market' approach furthermore augments the applicability of the 'Potential Competition Doctrine' towards R&D competition which will result in innovations creating an entirely new product market. Moreover, in contrast to the 'Potential Competition Doctrine', the 'Future Market' approach is also able to account for mergers of firms which are already competing with one another on a certain product market.

However, of all the existing approaches solely the 'Innovation Market Analysis' allows for the consideration of innovation competition in scenarios where the merging parties are already competing with one another on the respective product market and where the R&D efforts are furthermore either 'unobservable' or 'observable' but not expected to constitute a new product market (incremental innovations). Since both scenarios share the feature that the merging firms are already competing with one another on an actual product market, it could be argued that these mergers can be assessed sufficiently on the basis of considerations about

dynamic efficiencies on product markets. However, this again would presume that product market competitors can be equated with innovation competition competitors.

B. The 'Future Market' Approach and the 'Innovation Market Analysis': Two Different Approaches to Protect Innovation Competition

Beside the fact that the 'Potential Competition Doctrine' and the 'Future Market' approach cannot account for all aspects of innovation competition, it is also questionable whether the 'Future Market' concept, in particular, can fully account for innovation competition even in those cases in which it could generally be applied. However, in order to answer this question, it is first of all important to distinguish between the two different interpretations of the 'Future Market' approach. In the case in which the approach focuses on static price and non-price competition on future product markets, it necessarily requires that not just one, but both products will likely make it to the market. As a consequence, in order to justify an intervention, the 'Future Market' concept requires a high likelihood that both R&D projects will be successful.[71] However, the purpose of protection of an approach that accounts for innovation competition is rather the successful innovation itself. In other words, the considerations about innovation competition aim to protect the development of new products, independent of any requirements that future product market competition necessarily has to be protected. Hence, by focusing on future product market competition instead of innovation competition the authorities might fail to protect innovation in its full extent.

It was Commissioner Muris who highlighted the limits of the 'Future Market' concept in his statement regarding the FTC's *Genzyme/Novazyme* decision (a merger that led to a monopoly with respect to R&D). Thereby the agency decided, at the beginning of 2004, to close the investigation of the acquisition of Novazyme through Genzyme (which already took place in 2001). Both pharmaceutical firms were engaged in the research and development of Pompe enzyme replacement therapies (ERT) for treating Pompe disease, a rare but deadly disease that affects about 10,000 children and adults worldwide.[72] Commissioner Muris alleged in his statement:

[71] The probability that both firms innovate is significantly lower than the probability that at least one, or maybe both, firms innovate. Hence, if the agencies aim to protect innovation, it is more consistent to justify the intervention also on the basis of innovation concerns instead of considerations based on the protection of future product market competition.

[72] Mozelle W. Thompson, *Dissenting Statement of Commissioner Mozelle W. Thompson Genzyme Corporation's Acquisition of Novazyme Pharmaceuticals Inc*., File No. 021-0026 (Jan 13, 2004), *available at* http://www.ftc.gov/os/2004/01/thompsongenzymestmt.pdf (Aug. 20, 2013).

> […] because there is currently no treatment for Pompe disease, the most important goal for patients is to get one effective treatment for Pompe disease on the market as soon as possible, in quantities sufficient to treat the patient population. Accelerating the first effective treatment by even a few months would greatly benefit patients. Patient welfare would also be increased by having a second effective Pompe treatment arrive on the market sooner […]. Further, entry of a second therapy would likely cause a reduction in prices. These are significant considerations. Nevertheless, for a fatal disease without any effective therapy, acceleration of the first effective treatment remains of paramount importance.[73]

Hence, by expressing these thoughts Commissioner Muris explained why the 'Future Market' concept cannot fully substitute for an approach that directly accounts for innovation competition. Even though, in this particular case, he expressed these thoughts in order to underpin his decision not to challenge the *Genzyme/Novazyme* merger, he nevertheless demonstrated that innovation can be so invaluable that it deserves protection even absent of any considerations about future product market competition. Instead, also in his opinion, it was rather the successful innovation itself that was worth protecting, even though only one firm might succeed in getting its innovation into the market.[74] As a consequence, it can be supported that the merger was analyzed with respect to its likely impact on the probability of success for finding an effective treatment for Pompe disease instead of focusing on the protection of product market competition in the future.

Under the second interpretation of 'Future Markets', in which the concept is rather understood as an approach in order to protect the creation of new product markets in the future, these problems do not occur. Here, it is also the successful innovation itself which is the purpose of protection. However, besides the different labeling, it is questionable whether a 'Future Market' approach, under this notion, differs significantly from the 'IMA', or any other approach, designed for the protection of innovation competition.[75]

V. LESSONS FROM THE 'INNOVATION MARKET ANALYSIS': MAJOR SHORTCOMINGS AND SUGGESTIONS FOR A REVISED FRAMEWORK

It was demonstrated that, beside the 'Innovation Market Analysis' and a similar interpretation of the 'Future Market' concept, none of the existing approaches is actually capable to capture innovation competition in its full extent. However, the IMA was criticized by many lawyers

[73] Timothy J. Muris, *Statement of Chairman Timothy J. Muris in the matter of Genzyme/Novazyme Pharmaceuticals, Inc.*, File No. 021-0026, at 18 *et seq.* (Jan 13, 2004), *available at* http://www.ftc.gov/os/2004/01/murisgenzymestmt.pdf (Aug. 20, 2013).

[74] *See also* Katz & Shelanski, *supra* note 4, at 18.

[75] *See* Lang, *supra* note 19, at 760 *et seq.*

and economists. Whilst some said that the U.S. antitrust law would not support an approach like the one which was introduced by Gilbert and Sunshine,[76] others argued that the 'Innovation Market Analysis' would not add anything new to competition policy that the potential competition doctrine is not already covering.[77] Still others complained that the 'IMA', by focusing on R&D efforts, would solely maximize the inputs (R&D) instead of directly targeting the relevant output (innovation),[78] or that the agencies would, due to hidden information, never be able to identify the actual competitors on a particular 'Innovation Market'.[79] Nevertheless, the most profound critique was that a general presumption regarding the interdependencies between 'market structure' and innovation is impossible to define and that a theoretical and empirical basis to justify such an "[…] antitrust merger policy aimed at preserving competition in R&D markets […]"[80] would therefore be missing.[81]

Indeed, by relying exclusively on innovation incentive arguments, the 'IMA' was, on the one hand, based on a well accepted pattern of arguments, but, on the other hand, it relied on arguments which identified highly competitive as well as very concentrated 'markets' as beneficial for innovation. During the last decades, a lot of theoretical[82] and empirical[83] research was devoted to the question whether and how 'market structure' influences innovation. But, a general causal relationship could not be found. Against this background one has to conclude that the impact of a more or less concentrated 'market structure' on innovation hinges on the interplay of many distinct factors and that basically very competitive

[76] Hereby it is argued that the IMA is not in line with Section 7 of the Clayton Act because an Innovation Market does not fulfil the requirement of being "in line with of commerce or in any activity affecting commerce […]" to be considered under Section 7 of the Clayton Act. *See* Hoerner, *supra* note 41, at 50 *et seq*.; Richard J. Gilbert & Steven C. Sunshine, *The Use of Innovation Markets: A Reply to Hay, Rapp, and Hoerner*, 64 ANTITRUST L.J. 75 (1995).

[77] *See* Morse, *supra* note 41, at 27; Hoerner, *supra* note 41, at 55 *et seq*.; Hay, supra note 41, at. 14.

[78] *See* Richard T. Rapp, *The Misapplication of the Innovation Market Approach to Merger Analysis*, 64 ANTITRUST L.J. 19 (1995); Dennis W. Carlton & Robert H. Gertner, *Intellectual Property, Antitrust and Strategic Behavior, in* 3 INNOVATION POLICY AND THE ECONOMY 29, at 38 *et seq*. (Adam B. Jaffe et al. eds., MIT Press 2003); Robert W. Davis, *Innovation Markets and Merger Enforcement: Current Practice in Perspective*, 71 ANTITRUST L.J. 677, at 680 *et seq*. (2003).

[79] *See* Carlton & Gertner, *supra* note 78, at 41 *et seq*.

[80] Carlton & Gertner, *supra* n. 78, 39 *et seq*.

[81] *See also* Rapp, *supra* n. 78, 26 *et seq*.; Davis, *supra* n. 78, 681 *et seq*.; Jonathan Galloway, 'Driving Innovation: A Case for Targeted Competition Policy in Dynamic Markets', 34 *World Competition* 73 (2011).

[82] *See, e.g.*, Arrow, *supra* note 17; Glenn C. Loury, *Market Structure and Innovation*, 93 Q. J. ECON. 395 (1979); Richard J. Gilbert & David M.G. Newbery, *Preemptive Patenting and the Persistence of Monopoly*, 72 AM. ECON. REV. 514 (1982); Jennifer F. Reinganum, *The timing of innovation: Research, development, and diffusion, in* 1 HANDBOOK OF INDUSTRIAL ORGANIZATION 849 (Richard Schmalensee & Robert Willig eds., Elsevier 1989); Jan Boone, *Competitive Pressure: The Effects on Investments in Product and Process Innovation*, 31 RAND J. ECON. 549 (2000); Jan Boone, *Intensity of Competition and the Incentive to Innovate*, 19 INT. J. IND. ORGAN. 705 (2001); Philippe Aghion et al., *Competition and Innovation: An Inverted-U Relation-ship*, 120 Q. J. ECON. 701 (2005).

[83] For an excellent overview *see* Richard J. Gilbert, *Looking for Mr. Schumpeter: Where Are We in the Competition-Innovation Debate?, in* 6 INNOVATION POLICY AND THE ECONOMY 159, at 187 *et seq*. (Adam B. Jaffe et al. eds., MIT Press 2006).

'markets' as well as highly concentrated 'markets' can spur innovation. Important determinants are *e.g.* the regime of exclusive intellectual property rights, the distinction between process and product innovations, or the interrelatedness of 'old' and 'new' products and thus the degree of replacement.

Thus, many of these critics implicitly questioned whether the agencies should have the ability to intervene and therefore restrict the firms' freedom of action in order to protect innovative activity, due to a possibly simple intuitive link between concentration and innovation which, above all, seems to stand on a weak science-based ground.

Beside this, the 'IMA' furthermore failed to highlight another crucial determinant which can be decisive for innovation. Even though considerations in line with this determinant played an important role in the applied U.S. merger review, the 'Innovation Market Analysis' did not provide a sound theoretical foundation for considering the benefits of having a variety of heterogeneous and independent firms that undertake R&D in a certain field.

Thus, although the 'Innovation Market Analysis' appears to be the only existing assessment framework, which is able to account for innovation competition in its full extent, it also has its weaknesses. Given these weaknesses, one has to conclude that, to this day, there is still no adequate assessment framework/theoretical approach for the consideration of innovation competition in merger review. Therefore, the development of a revised assessment framework is suggested. However, since also a revised framework can neither go without a reasonable approach for the identification of the relevant competitors nor without relying on a sound theory of harm, it is important to consider for the experiences, the shortcomings and the criticisms which were brought forward with respect to the 'IMA'. Hence, in the following the three major shortcomings and points of criticism are picked up and subsequently discussed against the background of a revised framework for the assessment of innovation competition in merger review.

A. The Identification Problem of Innovation Competitors

One major point of criticism concerns the required identification of the relevant competitors. Many critics argued that the relevant competitors in terms of innovation are almost impossible to identify.[84] In this respect it was brought forward that R&D activities are often subject to secrecy so that the firms, currently pursuing R&D in a certain field, would be difficult to identify. Besides this, it was argued that innovations often 'come out of the blue'.[85] The idea

[84] *See*, *e.g.*, Carlton & Gertner, *supra* note 78, at 41 *et seq*.
[85] *See* Gilbert & Sunshine, *supra* note 3, at 588; Carlton, *supra* note 48, at 165.

behind this argument is that new products might be developed by companies which were not associated with certain innovations beforehand. Consequently, those companies would be entirely disregarded by the antitrust authorities. Hence, by assessing a certain merger, antitrust authorities might run the risk of being too restrictive because the relevant 'Innovation Market' would be defined too narrow. This aspect becomes especially important in very dynamic industries and changing markets.

However, with respect to the 2nd category of mergers (those mergers in which innovation competition is 'observable' due to regulatory approval procedures) innovations can hardly 'come out of the blue'.[86] In the 1st category of mergers, in which R&D programs are not 'observable', it is indeed more difficult to correctly identify the relevant competitors. But, innovations will again most likely not 'come out of the blue', if future innovations indeed require particular, specialized assets. These assets can also be understood as entry barriers for the participation in the process of innovation competition. Whenever these entry barriers can be characterized as being indispensable for the research and development in a certain field, as well as difficult to acquire and adopt in an adequate period of time, they can serve as a device for the identification of the relevant competitors. For instance, in the merger case of Lockheed Martin and Northrop Grumman it was (correctly) deemed as very unlikely that some unexpected companies, without having the necessary experience in this field, could innovate 'out of the blue' to compete with the next generation of fighter jets like today's "F-22 Raptor".

Beside this, it is not clear why antitrust authorities should be unable to identify a relevant competitor regarding innovation competition while we expect them to do basically the same with respect to the more accepted 'Potential Competition Doctrine'. A firm which is considered to be an 'Actual Potential Competitor' (or a 'Future Market' competitor) likewise has to be identified by its R&D efforts pursued to enter (or create) a particular product market. Moreover, it is not sufficient to solely identify one of the merging parties as an 'Actual Potential Competitor'. The antitrust agencies have to demonstrate that the loss of the respective 'Potential Competitor' has an anticompetitive effect. If there would be a high number of 'Actual Potential Competitors' equally planning to enter the particular market, it would be bold to allege anticompetitive effects as a consequence of the loss of only one of these firms. Thus, antitrust authorities have to be able to identify not only the 'Potential Competitor' affected by the merger, but also all other 'Actual Potential Competitors'. The same holds true for cases in which R&D programs are 'unobservable'. The loss of a

[86] *See* Carrier, *supra* note 48, at 401 *et seq*.

'Perceived Potential Competitor' has ultimately an anticompetitive effect, if there is not a bunch of other firms that would likewise discipline the merged entity. Hence, antitrust agencies necessarily have to be able to identify all 'Perceived Potential Competitors' via their capabilities and resources ('specialized assets') which would basically enable them to undertake R&D.

As a result, by focusing on specialized assets which have to be understood as (1) indispensable for certain innovations in a particular field and (2) difficult to acquire and adopt in an adequate period of time, the protection of innovation competition is made possible in the first place. However, at the same time the concept of specialized assets also established high requirements which have to be fulfilled before an approach that accounts for innovation competition can be applied. Whenever competition authorities fail to show that particular innovations require the possession of particular specialized assets, innovation competition necessarily has to be considered as an open process which leads to a withdraw of the economic reasons for an intervention. As a consequence, in order to avoid that innovation competition in dynamic industries and rapidly changing markets gets distorted, such an approach has to be understood as a narrow one that should only be applied to mergers which fulfill these demanding requirements.

B. The Missing Link Between 'Market' Structure and Innovation

Many authors have claimed that the 'Innovation Market Analysis' should not be applied in merger reviews because a general causal relationship between 'market concentration' and innovation cannot be identified. In contrast to price effects, it would not be clear whether more competition or rather highly concentrated 'markets' will foster innovation. Indeed, it is not possible to apply a general 'concentration-competition-welfare presumption'[87] with respect to product market concentration and the incentives and abilities to innovate. However, with respect to the discussion about the 'Innovation Market Analysis' it was first of all the term 'Market' which was misleading and subsequently caused a lot of critique. The word 'market' might have created the impression that the framework dealt with a real 'market' were goods are sold and profits are made. However, if we consider the 'IMA' as an approach for the assessment of innovation competition, we have to conclude that the firms on this 'Innovation Market' might, but not necessarily do, compete with one another on current product markets. Hence, many of the arguments about the ambiguous interrelationship between product market concentration and innovation cannot be upheld undisputed with

[87] *See* Katz & Shelanski, *supra* note 4, at 7 *et seq*.

respect to the interrelation between innovation competition and innovation. This stems from the fact that a reduction in innovation competition does not automatically affect pre-innovation product market competition. This, however, has strong implications. Consider for instance a merger of two innovation competitors which do not compete with one another on any product market. Such a transaction will consequently not augment the firms' ability to increase the mark-ups on pre-innovation product markets. Consequently, their ability to finance R&D by higher profits will not be improved. Likewise it is questionable, whether the considerations about the benefits of a higher pre-innovation market share for the firm's capability to appropriate its innovation profits can be upheld to the same extent under an approach that accounts for innovation competition detached from current product markets.

As a consequence, the findings regarding the ambiguous interrelationship between product market concentration and the incentives and abilities to innovate should not be transferred one-to-one to the interrelation between innovation competition and innovation. However, this important characteristic of innovation competition is often disregarded. For instance, Chairman Muris defended the FTC's decision to close the *Genzyme/Novazyme* case by highlighting the ambiguous interrelation between 'market concentration' and innovation, although Novazyme was a pure research company without any products to sell at the time of the merger (there was no pre-innovation product market for Pompe disease therapies).[88] Hence, under such a setting and in the absence of efficiency gains, there remain considerably less arguments why less innovation competition could be beneficial for innovation.[89] Regarding the empirical findings it can be stated that only little empirical research has been carried out on the interrelation between innovation competition and innovation where pre-innovation product markets are unaffected (or not existing). However, although there are only a few empirical studies which account for this aspect, they all indicate that there is a positive interrelation between innovation competition and innovation.[90]

[88] *See* Muris, *supra* note 73, at 5 *et seq*.

[89] The probably most important remaining arguments refer to a reduction of duplicative research efforts, increased innovation incentives as a consequence of an internalization of R&D spillovers, and higher incentives to innovate because post-innovation profits have to be shared with fewer competitors under imperfect IPRs. *See, e.g.*, Reinganum, *supra* note 82; Claude d'Aspremont & Alexis Jacquemin, *Cooperative and non-cooperative R&D in duopoly with* spillovers, 78 AM. ECON. REV. 1133 (1988); FREDERIC M. SCHERER & DAVID ROSS, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE, at 513-660 (Houghton-Mifflin, 3rd edn. 1990). Similar considerations about the likely effects of a reduction of competition on innovation, absent any efficiency gains, were also articulated by Katz & Shelanski, *supr*a note 4, at 38 *et seq*.

[90] *See, e.g.*, Martin Kukuk & Manfred Stadler, *Market Structure and Innovation Races: An Empirical Assessment Using Indirect Inference*, 225 JAHRB. NATL. STAT. 427 (2005); Jianmin Tang, *Competition and innovation behavior*, 35 RES. POLICY 68 (2006); *See also*, Walter G. Park & Ralph Sonenshine, *Impact of Horizontal Mergers on Research and Development and Patenting: Evidence from Merger Challenges in the U.S.*, 12 J. IND. COMPET. TRADE 143 (2012).

As a consequence, the ambiguous interrelationship between product market concentration and the incentives and abilities to innovate should not be regarded as an argument in favor of a general reluctance with respect to the protection of innovation competition.

C. The Missing Theoretical Basis for a Presumption Regarding Innovation Competition and Innovation

Although the interrelationship between innovation competition (taking place detached from current product markets) and the incentives and abilities to innovate is less cloudy than the corresponding interrelation between product markets and these incentives and abilities, it can still not be considered as definite and stable. As a consequence, competition authorities indeed cannot rely on a general presumption regarding innovation competition and the firms' incentives and abilities to innovate.

However, with respect to the more general interrelation between innovation competition and innovation, competition authorities might still find it reasonable to rely on such a presumption. Nevertheless, in contrast to the above mentioned discussion on the incentives and abilities to innovate, this presumption has to be based on another economic theory than the one provided by the neoclassical industrial organization literature. Instead, the theoretical basis for such a presumption can rather be found in evolutionary economics. The crucial difference from this perspective is (1) the consideration for (true) uncertainty[91] and (2) the allowance for the heterogeneous nature of firms. In his contributions to the debate about socialism and capitalism, F.A. Hayek identified exactly these factors as being causal for the predominance of a market economy over a central planner.[92] He stated that:

> The peculiar character of the problem of a rational economic order is determined precisely by the fact that the knowledge of the circumstances of which we must make use never exists in concentrated or integrated form, but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess.[93]

Hence, Hayek understood the firms and consumers as actors that have only a limited and subjective knowledge. As a result of the limited knowledge, the outcomes of the competition process can not be foreseen. Instead, competition has an inherent experimental character in which the best production processes, business practices and problem solutions have to be

[91] *See* FRANK H. KNIGHT, RISK, UNCERTAINTY, AND PROFIT, (Houghton Mifflin 1921).

[92] *See* Friedrich A. Hayek, *The Use of Knowledge in Society*, 35 AM. ECON. REV. 519 (1945); Friedrich A. Hayek, *Competition as a Discovery Procedure*, *in* NEW STUDIES IN PHILOSOPHY, POLITICS, ECONOMICS AND THE HISTORY OF IDEAS 179 (Friedrich A. Hayek ed., University of Chicago Press 1978).

[93] Friedrich A. Hayek, *The Use of Knowledge in Society*, 35 AM. ECON. REV. 519, at 519 (1945).

revealed over a process of trial and error. This implies that it is impossible to forecast which product, business culture or innovation project will be most successful.

Beside these considerations with respect to uncertainty, the subjectivity of knowledge leads to another important aspect. If all the market participants do only have a limited and contradictory knowledge, they can not be understood as being homogeneous. Instead, each firm must be seen as a unique entity which follows its own beliefs, expectations, routines, know-how and culture. Besides Hayek, the view of heterogeneity of market participants is also shared in the management literature, particularly in the 'resource-based view of the firm'.[94] This literature highlights the importance of a firm's particular resources like especially trained staff, experience, patents or a firm's business culture.[95] Thus, in contrast to mainstream neoclassical economics, it is implicitly assumed that firms differ in regard to their particular capabilities and that these capabilities cannot be acquired and adopted easily in an adequate period of time.

It is important to point out that this heterogeneity becomes exceptionally valuable in combination with the before mentioned uncertainty. Since it is impossible to identify optimal solutions in advance, it is particularly important that a variety of diverse market participants try out different approaches (due to their subjective knowledge and expectations). After all it were exactly these considerations that lead Hayek to the conclusion that a decentralized market economy with its multitude of several profit maximizing actors dominates a central planed economy.

As a consequence, in the innovation context which is particularly subject to uncertainty, it can be of great value that there are several firms that undertake R&D due to their subjective beliefs. In contrast to many industrial organization models in which parallel research is often seen as a wasteful duplication of R&D expenditures[96], parallel experimentation and a simultaneous 'testing of hypotheses' has to be seen more positive from this perspective.[97]

[94] *See* EDITH PENROSE, THE THEORY OF THE GROWTH OF THE FIRM (John Wiley and Sons 1959); Jay B. Barney, *Firm Resources and Sustained Competitive Advantage*, 17 J. MANAGE 99 (1991); CYNTHIA A. MONTGOMERY, RESOURCE-BASED AND EVOLUTIONARY THEORIES OF THE FIRM: TOWARDS A SYNTHESIS (Kluwer Academic Publishers 1995).

[95] *Id*.; *See also* Scott L. Newbert, *Empirical Research on the Resource-Based View of the Firm: An Assessment and Suggestions for Future Research*, 28 STRATEG. MANAGE. J. 121 (2007).

[96] This property is especially relevant in the context of patent race models. *See, e.g.*, Loury, *supra* note 82; Partha Dasgupta & Joseph E. Stiglitz, *Uncertainty, Industrial Structure, and the Speed of R&D*, 11 BELL J. ECON. 1 (1980). *See also* Reinganum, *supra* note 82.

[97] *See* Wolfgang Kerber & Nicole J. Saam, *Competition As a Test of Hypotheses: Simulation of Knowledge-generating Market Processes*, 4 JASSS (2001), *available at* http://jasss.soc.surrey.ac.uk/4/3/2.html (Dec. 17, 2013). *See also* Stanley J. Metcalfe, *Evolution and Economic Change, in* TECHNOLOGY AND ECONOMIC PROGRESS 54 (Aubrey Silbertson ed., Macmillan 1989); Richard R. Nelson, *Recent Evolutionary Theorizing about Economic Change*, 33 J. ECON. LIT. 48 (1995); Joseph Farrell, *Complexity, diversity, and antitrust*, 51 ANTITRUST BULL. 165 (2006); Kerber, *supra* note 23.

Constance K. Robinson, the former director of operations and merger enforcement of the DoJ, expressed this as follows: "Even if two firms are attempting to achieve the same goal, they will approach this effort in different ways, making different choices along the way."[98] And, most importantly: "It is a matter of judgment as to the extent that one R&D effort duplicates another, and even small differences can make one attempt successful and another a failure."[99]

As a result, the variety of firms and the benefits of parallel research are, beside the considerations about the firms' incentives and abilities to innovate, another very important determinant for innovation.[100] Moreover, this implies, at least from this point of view, that there is also a weak causal interrelation between the number of R&D projects, undertaken by heterogeneous entities, and innovation. Unfortunately, mainstream economics and in particular the modern industrial organization literature did not succeed in capturing these fundamental characteristics of a market economy. However, one can at least find a proof of contradiction. In their famous article Raaj K. Sah and Joseph E. Stiglitz[101] demonstrated that the number of firms pursuing research projects in parallel has only then no impact on the innovative performance of an industry, if we assume that firms are homogeneous. The authors acknowledged that in the model: "[…] the costs of a particular project, or the probabilities of its outcome, are not significantly affected by the "firm affiliation" of the project."[102] Thus, only if firms are considered as not being different with respect to the way how they do business, it is irrelevant if two R&D projects are undertaken by two distinct firms or simply by one big firm.[103] It is important to note that this does not imply that antitrust authorities should neglect the relevance of merger specific efficiencies. There is little doubt that there can emerge a trade-off between the benefits of having more diverse firms undertaking R&D on

[98] Constance K. Robinson, *Leap-frog and Other Forms of Innovation: Protecting the Future for High-Tech and Emerging Industries Through Merger Enforcement*, Address before ABA, at 2 (June 10, 1999), *available at* http://www.usdoj.gov/atr/public/speeches/2482.pdf (Dec. 17, 2013).

[99] *Id*.

[100] *See*, *e.g*., Kerber, *supra* note 23; Farrell, *supra* note 97; William S. Comanor & Frederic M. Scherer, *Comments Submitted to the Federal Trade Commission on the Pfizer-Wyeth and Merck- Schering Plough Mergers* (2009), *available at* http://www.ftc.gov/policy/public-comments/comment-544915-00004 (Dec. 17, 2013).

[101] *See* Raaj K. Sah & Joseph E. Stiglitz, *The Invariance of Market Innovation to the Number of Firms*, 18 RAND J. ECON. 98 (1987).

[102] *Id*., at 106.

[103] For a further discussion *see* Benjamin R. Kern & Malte Ackermann, *Shedding some Light on the Dark Matter of Competition: Insights from the Strategic Management and Organizational Science Literature for the Consideration of Diversity Aspects in Merger Review*, NO.05-2014 MAGKS - JOINT DISCUSSION PAPER SERIES IN ECONOMICS (2014), *available at* http://www.uni-marburg.de/fb02/makro/forschung/magkspapers/05-2014_ackermann.pdf (Jan. 15, 2014).

the one hand and the advantages of integrating these efforts into a stronger and more efficient entity on the other.[104]

As demonstrated in the chapter III, it is remarkable that these considerations about the benefits of "diversity" and "parallel research" played an important role in a considerable number of challenges to mergers and acquisitions. Besides this, it is furthermore noteworthy that also the U.S. IP Licensing Guidelines contain a "four-plus rule". There it is stated that an agreement is unlikely to have anticompetitive effects on innovation, if there are at least four other independently controlled entities.[105] However, since the 'Innovation Market Analysis' did only rely on arguments about the incentives and abilities to innovate, it did not provide a sound theoretical foundation for such a presumption.

D. Four Key Components for a Revised Approach

As a result, it can be suggested that a revised framework should consider the following key components:

1. Identification

Beside the traditional identification of the relevant competitors on the basis of current product markets, the potential anticompetitive effects of mergers should also be assessed on the basis of the identified relevant competitors due to their 'observable' research programs and specialized assets. The analysis above has shown that the identification of the relevant competitors is relatively uncomplicated whenever the respective R&D projects are indeed 'observable'. In this case it is relatively easy to identify the relevant firms that compete with one another in regard to certain innovations within the foreseeable future. In the case of 'unobservable' R&D projects this task is in fact more complicated. Thus, in order to avoid a too restrictive merger control, the authorities have to prove the indispensible character of the specialized assets. Whenever the authorities fail to show that these assets are in fact a necessary precondition for the participation in the process of innovation competition, the authorities are ought to stop the investigation at this point. This line of action is the necessary and important precondition in order to enable the competition authorities to account for innovation competition detached from actual product markets in the first place.

[104] *See, e.g.*, Wesley M. Cohen & Steven Klepper, *The Tradeoff Between Firm Size and Diversity in the Pursuit of Technological Progress*, 4 SMALL BUS. ECON. 1 (1992).

[105] Solely in the U.S. IP Licensing Guidelines of 1995 one can find a passage which indicates that the agencies apparently considered it necessary to preserve a variety of independently controlled R&D projects. *See* U.S. DEP'T OF JUSTICE AND FED. TRADE COMM'N, ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY § 3.2.3. (Apr. 6, 1995), *available at* http://www.justice.gov/atr/public/guidelines/0558.htm#t323 (Dec. 17, 2013) [hereinafter IP-GUIDELINES].

2. Incentives and abilities to innovate

As proposed in the 'Innovation Market Analysis', also a revised framework has to assess the potential anticompetitive effects of mergers on innovation competition. Hence, the authorities have to assess the potential unilateral and coordinated effects of a certain transaction. This requires an assessment of the expected effects of a certain merger on the firms' incentives and abilities to innovate. However, this assessment should not miss to account for the fact that innovation competition might take place detached from current product market competition. Hence, the ambiguous interrelationship between 'market concentration' and innovation should not be regarded as an argument in favor of a general reluctance with respect to the protection of innovation competition. Instead, it is advisable to follow Timothy Muris' claim for a fact dependent analysis of the incentives and abilities to innovate.

3. "Diversity" and "Parallel Research"

In contrast to the 'IMA', the theory of harm should not be based exclusively on neoclassical innovation incentive arguments. Hence, besides the assessment of unilateral and coordinated effects, a new framework should also consider for the evolutionary economics literature which provides a sound theoretical basis for the consideration of the benefits, stemming from a variety of different research tracks and diverse entities for innovation. Since these aspects can hardly be proved in a fact dependent analysis, it might be advisable to follow M. Katz and H. Shelanski, who voted, even though not from an evolutionary economics perspective, for a limited/weak presumption that a reduction in innovation competition is generally detrimental to innovation in the absence of efficiency gains.[106] Thus, even though such a 'weak' presumption in favor of competition can be rebutted if the parties demonstrate merger specific efficiency gains, it would cause a shift of the burden of proof.

[106] *See* Katz & Shelanski, *supra* note 4, at 38 *et seq*. Similar thoughts were raised by Robert Lande. *See* Robert H. Lande *Proposed Horizontal Merger Guidelines: Request for Public Comment – Fed. Trade Comm'n and U.S. Dep't of Justice HMG Review Project – Project NO. P092900 Views of the American Antitrust Institute* (June 4, 2010) *available at* http://www.ftc.gov/policy/public-comments/comment-548050-00025 (Dec. 17, 2013). Also Albert Foer highlighted recently the relevance of the preservation of decentralized, competitive markets for innovation. *See* Albert Foer, *DOJ closes door on AT&T/T-Mobile merger*, THE HILL (2011), *available at* http://thehill.com/blogs/congress-blog/economy-a-budget/181621-doj-closes-door-on-atat (Dec. 17, 2013).

4. Efficiencies

In analogy to the 'IMA', a revised framework should also account for the big potential of efficiency gains.[107] However, until today, merger review did not attach great importance to the efficiency defense once the authorities demonstrated anticompetitive effects on static price and non-price competition.[108] This circumstance is particularly critical in the innovation context.[109] Beside the fact that efficiencies regarding innovation might easily overcompensate anticompetitive price effects, the efficiency defense has to be regarded as even more important in connection with the protection of innovation competition. The requirement for a serious consideration of efficiency gains has to be seen as the necessary corrective to the weak presumption in favor of competition. Hereby, a too restrictive merger review can be avoided.

VI CONCLUSION

The purpose of this paper was to introduce and compare the (existing) alternative approaches for the consideration of innovation competition in merger review. Thereby it was shown, that the traditional approaches of 'Potential Competition' and 'Future Markets' cannot account for all aspects of innovation competition. In addition, it is questionable whether the 'Future Market' concept captures innovation competition in its full extent, even in those merger cases in which it can generally be applied. However, the 'Innovation Market Analysis', the only tool especially designed to account for innovation competition so far, also had several shortcomings. Hence, at present there exists no clear cut approach on which the antitrust agencies in the U.S. as well as in the E.U. could rely on in order to receive guidance for an intervention aiming at the protection of innovation competition. As a result, the development of a revised framework for the assessment of potential anticompetitive effects on innovation competition in merger reviews is required. Nevertheless, the 'IMA' might still serve as a good starting point for the development of a revised framework. Such a framework should, on the one hand, adopt the novel and very important idea of the 'Innovation Market Analysis' which for the first time identified the relevant innovation competitors independently of their role on current product markets, but also consider for the critique and the experiences in line with the 'IMA', on the other. In this connection, future research should primarily focus on the question of whether and how a certain merger has an impact on the firms' incentives and abilities to

[107] For a detailed discuss on possible efficiency gains of mergers regarding innovation *see* U.S. ANTITRUST MODERNIZATION COMMITTEE, REPORT AND RECOMMENDATIONS ch. I.B., at 56 *et seq*. (2007), *available at* http://govinfo.library.unt.edu/amc/report_recommendation/chapter1.pdf (Dec. 17, 2013).

[108] *See* David A. Balto, *The Efficiency Defense in Merger Review: Progress or Stagnation?*, 16 ANTITRUST 74 (2001).

[109] A stronger recognition of innovation related efficiency gains was also a central issue in the Report of the *Antitrust Modernization Commission*. *See* U.S. ANTITRUST MODERNIZATION COMMITTEE, *supra* note 107.

innovate. However, this assessment should be carried out against the background of the different competition scenarios in which a certain merger can take place. Consequently, there will be situations in which innovation incentives are affected by both, a change in innovation competition and a change in pre-innovation product market competition. In other scenarios, however, current product markets are unaffected and the incentives to innovate will therefore be affected exclusively by a change in innovation competition.