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Competition analysis of Barriers to entry theory in relation to innovation and R&D in the EU legal order

Master thesis
30 credits

This thesis deals with how barriers to entry theory has been interpreted in an innovation markets context in the EU legal order.

Entry barriers are found to be interpreted in a broad manner, following an interventionist approach by the EU judiciary. This thesis further offers an analysis of how barriers to entry should be interpreted using an economics based approach. As barriers entry is based on economic theory, a discussion on the economic background to competition law represents an important part of the analysis.

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Summary

This thesis deals with how barriers to entry theory has been interpreted in an innovation markets context in the EU legal order. It further offers an analysis of how barriers to entry should be interpreted using an economics based approach.

The scope for this thesis is TFEU Art 101 and Art 102, from which an ex-ante and an ex-post approach on barriers to entry analysis has emanated. The ex-ante analysis regards horizontal co-operation agreements and horizontal mergers, while the ex-post analysis regards abuse of a dominant position. By investigating barriers to entry in innovation and R&D from two perspectives, differences in the employment of barriers to entry theory in relation to competition in innovation and R&D is found.

Innovation markets is the concept where no existing product market has yet emerged but important R&D for the development of future markets can be found. The aim is to protect innovation and R&D and not allow for undertakings' to reduce the pace of innovation below competitive levels as such a reduction would have a negative impact on future competition on product markets. This concern is particularly an issue in industries driven by innovation, for example the pharmaceutical industry. Assessing competition in innovation and R&D has been debated heavily amongst lawyers and economists due to the weak correlation between the rate of R&D and the quantum of innovation produced.

Barriers to entry theory has been applied extensively in competition analysis in the EU legal order with regard to competition in innovation and R&D. It is employed as a tool to assess the competitive constraints an incumbent is exposed to from potential entrants. Two economic schools of thought has dominated the aims of competition law, the Harvard school and the Chicago school. Depending on the economic theory applied, barriers to entry is defined differently, resulting in different outcomes of which factors are considered to act as constraints on incumbents.

Through the case law regarding merger control, a broad stance has been taken towards what constitutes barriers to entry in innovation and R&D. A wide variety of factors are alleged to deter entry, often relating to sunk costs, time, competence and resources. The ex-ante employment of entry barriers relates to factors connected to *market structure* with the aim to discover and avoid possible future dominance.

The ex-post analysis entails a different outcome, where barriers to entry is connected to a dominant undertaking's *abusive conduct*. In the ex-post analysis, such factors as competence or sunk costs are not per se regarded as entry barriers. By connecting entry barriers with abusive conduct, the ex-post employment of entry barriers becomes narrower compared to the ex-ante employment, as it centers around an incumbent's behaviour to deter entry.

Two conclusions are made from the analysis.

First, the broad scope of ex-ante employment of barriers to entry entails that the Harvard school of thought has had a decisive influence on the interpretation of entry barriers. Few factors escape being defined as entry barriers, with the effect of conferring market power on an incumbent in situations where it might be questionable whether it actually has the ability to reduce the pace of innovation below competitive levels. The ex-post perspective entails an approach where barriers to entry is attached to the incumbents conduct, resulting in a narrower Chicago school definition of entry barriers. Such an approach reduces the amount of constraining factors conferred on incumbents.

Secondly, the twofoldness of barriers to entry employment entails an analytical tool that is difficult to master, with negative consequences regarding clarity and legal certainty for parties active on a market driven by innovation. With the innovation market approach already suffering from an unclear definition, a less interventionist approach is argued by the author, creating margins, in particular when assessing mergers and co-operation agreements. Even if the EU judicature historically has focused on the protection of the competitive process, the uncertainty regarding the outcome of the current employment of barriers to entry in innovation and R&D would benefit from an approach focused more on economic reasoning and the dynamic aspects of efficiency.

Sammanfattning

Detta examensarbete behandlar ur ett konkurrensrättsligt perspektiv hur inträdesbarriärer tolkats i relation till innovationsmarknader inom EU-rätten. Vidare innehåller arbetet en de lege ferenda analys av hur inträdesbarriärer bör tolkas baserat på nationalekonomiska teorier.

Examensarbetet tar sin utgångspunkt i de båda konkurrensrättsliga artiklarna i Fördraget om Europeiska Unionens funktionssätt, artikel 101 och artikel 102. Den analytiska utgångspunkten är ett ex-ante och ett ex-post perspektiv. Ex-ante analysen behandlar horisontella samarbeten och horisontella företagskoncentrationer, medan ex-post perspektivet behandlar missbruk av en dominerande ställning. Genom att anlägga ett före-och-efter perspektiv, tydliggörs skillnader i tillämpningen av inträdesbarriärer i relation till innovation och FoU (Forskning och Utveckling).

Innovationsmarknadsbegreppet är en reaktion på när den konkurrensrättsliga analysen begränsar sig till att behandla existerande produktmarknader, men där oro finns att minskad konkurrens inom innovation och FoU riskerar att påverka framtida produktmarknader negativt. Analysen har främst rört innovationsdrivna marknader, till exempel läkemedelsindustrin. Tillvägagångssättet att analysera konkurrens inom innovation och FoU är omdebaterat bland jurister och nationalekonomer beroende på det svaga sambandet mellan storleken och takten på forskningen och den mängd innovationer som forskningen ger upphov till.

Metoden att analysera inträdesbarriärer i relation till konkurrens inom innovation och FoU är utbredd inom EU-rätten. Inträdesbarriärer används generellt som ett verktyg för att värdera de faktorer som utgör ett konkurrensbegränsande tryck på etablerade marknadsaktörer. Ett tryck som kommer från potentiella konkurrenter som vill in på en ny marknad. Inträdesbarriärer är ett ekonomiskt begrepp och beroende av vilken ekonomisk teori som ligger bakom definieras inträdesbarriärer på olika sätt. Två ekonomiska skolor har dominerat diskussionen kring målet och syftet med konkurrensrätten, Harvardskolan och Chicagoskolan. Vilken ekonomisk skola som bildar bakgrund till analysen av inträdesbarriärer får således konsekvenser för vilka faktorer som anses kunna begränsa etablerade marknadsaktörer från att missbruka sin ställning.

Genom Kommissionens rättspraxis beträffande kontroll av företagskoncentrationer, har en bred tillämpning av vilka faktorer som utgör inträdesbarriärer i relation till innovation och FoU tagits. Ett stort antal faktorer påstås avskräcka potentiella konkurrenter från marknadsinträde, ofta uttryckt som ej återvinningsbara kostnader, tid, kompetens och resurser. Ex-ante tillämpningen av inträdesbarriärer sätts i samband med faktorer kopplade till *marknadsstrukturen* med målet att upptäcka och undvika en möjlig marknadsdominans.

Ex-post tillämpningen av inträdesbarriärer sätts däremot i första hand i samband med faktorer som kopplas till ett företags missbruk av en dominerande ställning. Genom att koppla inträdesbarriärer till missbruket av dominerande ställning, blir tillämpningen av inträdesbarriärer smalare jämfört med ex-ante perspektivet eftersom det fokuserar på en etablerad marknadsaktörs *beteende* att hindra inträde.

Två slutsatser kan dras från ovanstående analys.

Först, den breda tillämpningen av inträdesbarriärer ex-ante, ger att det är Harvardskolans breda definition av inträdesbarriärer som har haft ett avgörande inflytande på uttolkningen av inträdesbarriärer. Få faktorer kommer undan att definieras som inträdesbarriärer. Konsekvensen blir att etablerade marknadsaktörer tillerkänns förmågan att minska storleken och takten på FoU när det kan ifrågasättas om de faktiskt har sådant inflytande. Tillämpningen av inträdesbarriärer ex-post medför att inträdesbarriärer kopplas till ett företags beteende, med följderna att en smalare tillämpning mer baserad på ett förhållningssätt baserat på Chicagoskolans doktrin. Detta smalare förhållningssätt minskar de faktorer som anses kunna begränsa etablerade marknadsaktörer från att missbruka sin ställning.

För det andra, den dubbla måttstocken av tillämpningen av inträdesbarriärer som koncept ger ett analytiskt redskap som är svårt att använda. Detta skapar osäkerhet och har en negativ påverkan på rättssäkerheten för företag aktiva på marknader som drivs av innovation. Eftersom innovationsmarknadskonceptet är oklart och omdebaterat från första början, argumenterar författaren för en mindre interventionistisk hållning av tillämpningen av inträdesbarriärer. Detta för att skapa marginal när konkurrens inom innovation och FoU analyseras, speciellt i ett ex-ante perspektiv. EU-rätten har historiskt fokuserat på att skydda förutsättningarna för en sund konkurrens på marknaden. Med den osäkerhetsaspekt som nuvarande tillämpning av inträdesbarriärer medför, skulle en tillämpning av inträdesbarriärer som fokuserar mer på ekonomisk effektivitet medföra en mer rättssäker analys av konkurrens inom innovation och FoU.

Preface

This thesis marks the end of my time as a student at Lund University. The academic world in Lund is a far cry from my childhood in north of Sweden, where studying at a University was far from obvious. Growing up, I was more occupied with fishing and outdoor activities rather than studying for an academic diploma. Therefore, this thesis represents a great personal achievement.

My life as a student started in 2004, studying first Business followed by Political Science. After a one year study break, working as a full time Kurator (manager) for the student organisation Helsingkrona nation, I was finally in 2006 admitted to study law.

My interest in competition law started with the inspiring teaching of Professor Katarina Olsson. During my fourth year of studying law, I went to University of Glasgow as part of an Erasmus student exchange. Attending a course in European competition law, one of the tasks was to write an essay on horizontal co-operation R&D agreements. The seed for this thesis was thereby planted in my head.

I would like to thank my supervisor, Professor Hans Henrik Lidgard, to whom I am grateful for providing me with much needed guidance and impetus in times of doubt of the direction of this thesis. I would also like to thank my fellow student thesis writers here at the Faculty of Law for interesting discussions and valued company on coffee breaks and after school beer drinking.

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Abbreviations

R&D	Research and Development
TEU	Treaty on European Union
TFEU	Treaty on the Functioning of the European Union
CJEU	The Court of Justice (Previously known as the European Court of Justice)
CFI	Court of First Instance (today named the General Court)
NCA	National Competition Authority
ECMR	European Community Merger Regulation
JV	Joint Venture
DG Comp	Directorate General Competition
FTC	Federal Trade Commission
IPR	Intellectual property right

1 Introduction

1.1 Background

Success in *innovation* is widely regarded as a determinant for a competitive economy and is an often discussed topic amongst politicians and in public forums. In the European Union 2020 Flagship Initiative,¹ the Commission of the European Union² places innovation at the heart of the Union's ability to tackle diverse societal challenges as climate change, health, aging populations and energy and resource scarcity. OECD³ defines *innovation* as 'a good or service that is new or significantly improved. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics'.⁴ Innovation is a matter of *novelty*. It is the process leading up to new and improved products and is usually achieved through research and development⁵. The function of competition law is to ensure that the innovative process remains undistorted.

Although lawyers in competition law somewhat recently started to show interest in competition in innovation and R&D, the discussion on innovation in concentrated markets can be traced back to the Austrian-American economist Joseph Schumpeter who theorized that innovation is often provided by large firms with high market shares.⁶

Many industries are driven by innovation and R&D. The pharmaceutical industry and the crop protection industry are two examples. In these industries emphasis is on the ability to develop new generations of products on an already existing product market or to develop completely new products for a new market that did not exist before.

The approach to appraise R&D on a product market or a future market to identify constraints on competition has been heavily debated but has gained traction over the years. Today, it is an established part of the analysis regarding competition law cases in the EU. In the *Bayer-Aventis* merger the Commission stated:

¹ European Commission: *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions*, Brussels, 6.10.2010 COM(2010) 546 final

² from here on only referred to as the Commission.

³ *Organisation for Economic Co-operation and Development* is an international economic organisation, acting as a forum for its 34 member states, employed to promote policies to improve the economic and social well-being of people around the world.

⁴ http://www.oecd.org/document/10/0,3343,en_2649_33723_40898954_1_1_1_1,00.html

⁵ from here on only referred to as R&D.

⁶ Joseph Schumpeter, *Capitalism, socialism and democracy*, 3rd ed, 1942, New York

*'In the past the Commission has often seen reasons for concern in the grouping of companies with strengths in R&D and innovation. For the purpose of this decision, the Commission considers that the parties R&D capabilities and incentives have to be taken into account as regards the potential elimination of future competition in current product markets and future markets.'*⁷

Innovation lies at the heart of competition and accordingly the innovative process is important to protect.

An important task in protecting the innovative process is to avoid undertakings becoming too dominant on the relevant market and thereby distorting competition. The traditional way of assessing the competitive structure on a market has been to establish market shares on the relevant market. Such an approach obviously entails difficulties when assessing competition in innovation and R&D with regard to future markets. Therefore, next to market shares, potential entry by competitors has been acknowledged as an important factor to refrain dominant players from exercising market power. This has entailed a procedure where barriers to entry is defined as a means to detect the competitive constraints incumbents face. If the entry barriers are low, competitors can easily enter a market and thereby act as constraints on incumbents. Barriers to entry theory has been applied extensively in competition analysis in the EU legal order with regard to competition in innovation and R&D. Though an important tool for analysing competitive constraints, the EU judicature has not provided a clear guidance for its employment of barriers to entry theory.

In the Commission's *Glossary of terms used in competition policy*, it is simply stated that barriers to entry are 'factors that prevent or hinder companies from entering a specific market.'⁸ At the same time, barriers to entry is an economic term and depending on the economic theory applied, barriers to entry is defined differently, resulting in different outcomes of which factors are considered to act as constraints on incumbents. The two main economic schools of thought that has dominated the definition of barriers to entry is the Harvard school and the Chicago school. How barriers to entry is defined also reflects the aims of competition law in general.

This calls for elucidation on how and when barriers to entry analysis should be employed in the EU legal order regarding innovation and R&D. Accordingly, this thesis will examine the approach taken towards barriers to entry in innovation and R&D in the EU legal order.

⁷ Case COMP/M.2547 – *Bayer/Aventis Crop Science*, 2002, para 19

⁸ European Commission: *Glossary of terms used in competition policy*

In the analysis of innovation markets Marcus Glader's *Innovation Markets and Competition Analysis – EU competition law and US antitrust law*⁹ is a primary source. For the economic analysis Simon Bishop and Mike Walker's *The Economics of EC Competition Law*¹⁰ has been of outmost importance.

1.2 Purpose

The purpose of this thesis is to analyse how barriers to entry has been interpreted in the EU legal order regarding competition in innovation and R&D.

1.3 Delimitations

Competition law is a broad subject with many interesting topics to discuss. The limited scope of this master thesis however does not allow for all aspects of competition law to be discussed. Hence, two important delimitations must be made.

In the European Union, apart from economic welfare¹¹, a second competition law objective is the 'single market imperative'.¹² Competition law is used as a tool to bring the EU Member States closer together, bringing down national barriers and turning EU into a single economic market.¹³ Although an interesting subject, for the purpose of this thesis, the internal market objective is of little relevance and hence it will be excluded.

A United States perspective of law often serves as a meaningful comparison in competition law due to the lengthy time antitrust law has been employed in the US legal order. As the concept of analysing competition in innovation and R&D emanates from the US legal order, it will be briefly touched upon to provide to the reader the necessary background for the understanding of the concept of competition in innovation. The same approach will be used to explain the economics background to competition law, US doctrine. But even though as interesting as it would be, the scope of this thesis does not allow for a full comparison of the US approach to barriers to entry regarding innovation and R&D.

⁹ 2004, Faculty of Law, Lund University

¹⁰ 3rd edition, 2010 London

¹¹ A more thorough analysis of the economic objective is found in chapter 4.3. regarding economic efficiency.

¹² Goyder & Albors-Llorens, *Goyder's EC Competition Law*, 5th edition, 2009 Oxford, p.

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¹³ The Treaty on European Union Art 3(3) and The Treaty on the Functioning of the European Union Art 3(1) (b).

1.4 Method

This thesis will apply a traditional legal dogmatic method of analysing the sources of applicable law in the EU legal order. The aim is to investigate how the barriers to entry theory is understood in relation to competition in innovation and R&D.

Further, a law and economics method will also be applied. Competition law is sprung from economic theory and it is doubtful whether it would be useful to analyse competition law without an economic perspective. The economic perspective entails a forward looking (*lex ferenda*) discussion on how barriers to entry theory *should* be understood when analysing competition in innovation and R&D.

1.5 Material

The legal sources in the European Union can be listed under four headings, (I) the treaties,¹⁴ (II) EU legislative acts¹⁵, (III) case law from the Court of Justice of the European Union¹⁶, and (IV) the general principles of EU law.¹⁷ This is the fundamental legal hierarchy under which the analysis for this thesis will be conducted.

Due to the nature of the subject of this thesis, a considerable part of the material will derive from Commission decisions on merger control. It can be debated whether such decisions should be considered to constitute case law and accordingly which legal value it should confer. In this context two notes must be made. First, mergers are seldom appealed to the Union Courts. The fast moving corporate world does not fit well with lengthy time spans involved in an appeal process. Therefore, these Commission decisions are most of the time the end station of the legal assessment in the EU judiciary regarding merger control and consequently the closest we will get to a legal judgment.

¹⁴ TEU and TFEU, which has the same legal value.

¹⁵ Regulations, Directives, Decisions, Recommendations and Opinions, pursuant to TFEU Art 288.

¹⁶ The Court of Justice of the European Union (CJEU) includes the Court of Justice (ECJ) and the General Court (previously the Court of First Instance, CFI), TEU Art 19. The Court shall ensure that in the interpretation and application of the Treaties the law is observed.

¹⁷ The general principles of EU law are unwritten principles developed by the Court deriving from the Member States national legislation and international treaties to which the Member states are signatories. The right to judicial protection, the principle of proportionality and the principle of legal certainty are a few of the principles recognized by the Court. See e.g. Case 5/88, *Wachauf v. Federal Republic of Germany*, [1989] ECR 2609, para 17 and Takis Tridimas, *The general Principles of EU law*, 2nd edition, 2006, Oxford, for more information.

Secondly, the General Court has held on a number of occasions, it confines its review on complex economic appraisals provided by the Commission to ensure the relevant rules on procedure and on stating reasons have been complied with, that the facts have been accurately stated and that there has not been any manifest error of assessment or a misuse of powers.¹⁸ Accordingly when assessing such complex economic reasoning as what constitutes barriers to entry, Commission decisions seem to be the main legal source.

In its role of enforcing EU competition law, the Commission issues Notices or Guidelines. These documents are the Commission's interpretation of the law and consist of a compilation of earlier case law from the EU courts together with the Commission's own view on the subject matter.¹⁹ These guidelines are without prejudice to the interpretation which may be given by the ECJ.²⁰ At the same time, the ECJ has held that such guidelines may form rules of practice from which the administration may not be able to depart in an individual case without breaching general principles of law, for instance the principle of equal treatment.²¹ This ruling adds weight to the role notices and guidelines play and their importance cannot be overlooked when analysing EU competition law.

This thesis will further employ legal and economic doctrine when appropriate to elucidate certain aspects of law or when the academia has criticized or suggested important interpretations of EU law.

Some explanation is in order regarding some of the sources used. Throughout this work not only reliable sources but also first hand sources are used. Reliability of the sources is not compromised, however, in some cases second hand sources have been employed. These sources regard some of the definitions used in economic theory where the original source has proven very hard to find, with a negative impact on time economy. These theories were developed a long time ago and the literature where originally presented is dated. In these cases references are made to second hand sources. The information regarding these sources is cross checked through various books to make sure they are coherent. I am therefore confident that these second hand sources are not detriment to the quality of my work.²²

¹⁸ *Microsoft Corp v. Commission of the European Communities*, Case T-201/04 [2007] ECR II-3601, para 87, see also *Kish Glass v. Commission*, Case T-65/96, [2000] ECR II-1885, para 64, upheld by the ECJ in *Kish Glass v. Commission*, Case C-241/00 P, [2001] ECR I-7759

¹⁹ see for example Commission Notice: *Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings*, OJ C 31/3 [2004], para 6

²⁰ see for example Commission Notice: *Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings*, OJ C 31/3 [2004], para 7

²¹ *Dansk Rørindustri A/S and Others v. Commission*, Joined cases C-189/02 P, C-202/02 P, C-205/02 P to C-208/02 P and C-213/02 P, [2005] para 209-211

²² See the Stiegler definition of barriers to entry in Chapter 4.5.

1.6 Outline

This thesis will commence with a rather detailed background regarding the legal context in which competition in innovation and R&D is analysed. It will touch upon subjects as market power, dominance, competitive constraints, and market definitions. This legal background will set the context for the analysis of barriers to entry in competition in innovation and R&D.

Next step will be to provide a background to some of the economic aspects of competition law. This will elucidate the economic objective of competition law, as well as the context in which the concept of barriers to entry operates and its different definitions. Depending on the definition used, the view on competition law will differ, thus entailing different outcomes when analysing for instance proposed mergers or assessing abuse of a dominant position.

The core chapter of this thesis is the analysis and interpretation of barriers to entry in an innovation and R&D context. This analysis will consist of an exposition of the relevant case law.

Finally, a conclusion with a *lex ferenda* analysis will be provided.

2 The legal framework

2.1 Scope

The legal context for competition law analysis in EU is TFEU Art 101 and Art 102.²³ Emanating from each one of these two articles, different perspectives will form the analytical framework, the ex-ante perspective and the ex-post perspective.

An ex-ante perspective emanates from the legal framework for horizontal mergers and horizontal co-operation agreements. The Merger Regulation,²⁴ with adherent guidelines,²⁵ together with the guidelines regarding horizontal co-operation agreements²⁶ forms the starting point of the ex-ante assessment.

The ex-post perspective focus on the abuse of a dominant position pursuant to TFEU Art 102. In 2009, the Commission issued a Guidance Paper on the Commission's enforcement priorities in applying Art 102.²⁷ TFEU Art 102 with adherent guidance paper will form the basic analytical framework for the ex-post analysis.

In applying an ex-ante perspective and an ex-post perspective, the aim is to illustrate how barriers to entry has been interpreted in the EU legal order. Ex-ante decisions easily opens up for debate and the analysis is generally considered to be difficult as it entails the task of "looking into the crystal ball" and trying to assess what the future might bring. The ex-post perspective is more easily assessed as all the facts are known when conducting the analysis. By comparing the two perspectives, the aim is to elucidate how barriers to entry has been interpreted regarding innovation and R&D.

²³ The articles were renumbered with the Lisbon Treaty coming into force 1 december 2009. With the Lisbon Treaty, EC competition law is from now on referred to as EU competition law.

²⁴ Council Regulation 139/2004, on the control of concentrations between undertaking, OJ L 24/1 [2004]. From here on referred to as the ECMR.

²⁵ Commission Notice: *Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings*, OJ C 31/3 [2004]

²⁶ Commission Notice: *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, OJ C 11/1 [2011]

²⁷ *Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings*, OJ C 45/02 [2009]

2.2 The ex-ante analysis

The ex-ante analysis emanates from a horizontal perspective when a concentration or a co-operation agreement regards the situation where the undertakings involved are actual or potential competitors on the same relevant market.²⁸

The ECMR defines a concentration as

the merger of two or more previously independent undertakings or parts of undertakings, or

*the acquisition, by one or more persons already controlling at least one undertaking, or by one or more undertakings, whether by purchase of securities or assets, by contract or by any other means, of direct or indirect control of the whole or parts of one or more other undertakings.*²⁹

The aim with the ECMR is to maintain undistorted competition on an open market. The maintenance of effective competition includes protecting constraining factors that may be harmed as a result of the creation or strengthening of a dominant position.³⁰ Accordingly, the purpose of the merger regulation is for the authorities to be able to supervise and regulate changes in the market structure.³¹

Pursuant to ECMR Art 2, concentrations should be appraised in accordance with the Regulation's objectives and establish whether they are compatible with the common market or not. The appraisal entails the Commission to take into account the structure of the market. The market position of the undertakings involved in the merger should be assessed with regard to their economic and financial strength, but also any legal or other barriers to entry. If a concentration is found not to significantly impede effective competition in the common market, it should be declared compatible with the common market. The strengthening of a dominant position is particularly pointed out as incompatible with the common market.

²⁸ Commission Notice: *Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings*, OJ C 31/3 [2004], para 5 and Commission Notice: *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, OJ C 11/1 [2011], para 1

²⁹ Council Regulation 139/2004, on the control of concentrations between undertaking, OJ L 24/1 [2004], Art 3

³⁰ *ibid*, preamble para 24-26

³¹ *ibid*, Art 2

In 2004, the Commission issued a guidance paper on its view on appraisal of horizontal mergers.³² Herein, the Commission continues to stress that restraints on effective competition is most often found in relation to the creation or strengthening of a dominant position.³³ A merger's incompatibility with the common market is consequently closely linked to the concept of dominance.

The horizontal co-operation agreements Guideline sets the analytical framework for TFEU Art 101 assessment and is based on the notion that horizontal co-operation can lead to substantial economic benefits.³⁴

TFEU Art 101 (1) states

The following shall be prohibited as incompatible with the internal market: all agreements between undertakings, decisions by associations of undertakings and concerted practices which may affect trade between Member States and which have as their object or effect the prevention, restriction or distortion of competition within the internal market[...].

The purpose with the Guideline is to provide an analytical framework for the most common types of horizontal co-operation agreements. The aim is to strike a balance between pro-competitive effects and adverse effects on competition in situations with undertakings on the same relevant market that wish to co-operate. Co-operation is not per se prohibited but only on its restrictive effect on competition. The goal with assessing horizontal co-operation agreements are thus the same as for horizontal merger assessment.

Accordingly, the analytical framework for mergers has certain common elements with horizontal co-operation agreements, particularly the analysis pertaining to potential restrictive effects. Mergers and full function joint ventures share aspects regarding their structure and their restrictive effects can therefore be quite similar.³⁵ Horizontal mergers and horizontal co-operation agreements will be assessed under one ex-ante heading.

³² Commission Notice: *Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings*, OJ C 31/3 [2004]

³³ *ibid*, para 4

³⁴ Commission Notice: *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, OJ C 11/1 [2011], para 1-5

³⁵ Commission Notice: *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, OJ C 11/1 [2011], para 21. See also S. Bishop & M. Walker, *The Economics of EC Competition Law*, 5-056

2.3 The ex-post analysis

The ex-post perspective emanates from TFEU Art 102 and the unilateral conduct of undertakings with market power. Art 102 prohibits a dominant undertaking to abuse its position as a market leader on the relevant market.

TFEU Art 102 states

Any abuse by one or more undertakings of a dominant position within the internal market or in a substantial part of it shall be prohibited as incompatible with the internal market in so far as it may affect trade between Member States.

It is important to note that holding a dominant position is in itself not prohibited. At the same time, a dominant market player has been found to be subject to special responsibility, not allowing its conduct to impair undistorted competition.³⁶

The application of TFEU Art 102 by the Commission and the Union Courts has been controversial. Criticism has often been launched relating to a failure by the EU judicature to identify the objectives of the law, thus having the effect of protecting competitors rather than protecting consumers.³⁷ This criticism has often related to exclusionary conduct, the situation where an undertaking is engaged in conduct with the effect of reinforcing their dominant position and excluding actual or potential competitors from a market.³⁸

This criticism sparked the Commission to initiate a review of its enforcement priorities of Art 102, resulting in a Discussion Paper on the application of Article 82 of the Treaty to exclusionary abuses.³⁹ In 2009 the Commission presented the final result of the review, as it released a Guidance Paper on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings.⁴⁰ The Commission stated it would focus its priorities on conduct most harmful to consumers, and where new and improved goods and services were important aspects of consumer welfare.⁴¹

³⁶ *Nederlandsche Banden Industrie Michelin (Michelin I) v. Commission*, Case 322/81 [1983] ECR 3461, para 57

³⁷ A. Jones & B. Sufrin, *EC competition law – text, cases and materials*, 3rd ed, 2008 Oxford, p. 294

³⁸ *Europemballage Corp and Continental Can Inc v. Commission*, Case 6/72, [1973] ECR 215, [1973] CMLR 199

³⁹ DG Competition discussion paper on the application of Article 82 of the Treaty to exclusionary abuses, 2005

⁴⁰ *Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings*, OJ C 45/02 [2009]

⁴¹ *ibid*, para 5

The Commission emphasized that since the aim is to protect the competitive process and consumer welfare, not the competitors, it may have the result of undertakings not being able to deliver enough innovation and thus leaving the market.⁴² The Commission indicated it might consider an undertaking's conduct to create barriers to entry,⁴³ for instance when a dominant incumbent has made large investments that new entrants will have to match in order to be able to enter the market.⁴⁴

⁴² *Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings*, OJ C 45/02 [2009], para 6

⁴³ *ibid*, para 17

⁴⁴ *United Brands Co. v. Commission*, case 27/76 [1978] ECR 207, para 91

3 Competition in innovation and R&D

3.1 The legal context

The standard method of delineating competition has been to discriminate between actual competition and potential competition.⁴⁵ Actual competition regards the most immediate form of competition, competition in existing product markets. Potential competition is the concept where the assessment regards whether potential competitors have the ability to enter an existing product markets.⁴⁶ It focuses on the effect potential entrants might have on incumbents of a certain market. Potential competition might be assessed with reference to R&D, but might just as well be assessed with regard to existing product markets. Usually, actual competition and potential competition is included in the same meaning.⁴⁷

On top of these two concepts, lies the concept of innovation markets.⁴⁸ This debated concept focuses on competition in innovation and R&D where no existing product market has yet emerged. Despite being a debated concept, the approach to delineate a market for future product markets has become an accepted way of assessing competition in certain situations. At the same time, it must be acknowledged that the line between potential competition and competition in innovation is not a clear one.

⁴⁵ Commission Notice: *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, OJ C 11/1 [2011], para 1

⁴⁶ Commission Notice: *Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings*, OJ C 31/3 [2004], para 58-60

⁴⁷ Commission Notice: *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, OJ C 11/1 [2011], para 10

⁴⁸ Commission Notice: *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, OJ C 11/1 [2011], para 119-122 and Commission Notice: *Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings*, OJ C 31/3 [2004], para 37-38

Different notions have been used when discussing competition in innovation and R&D. In the *Bayer-Aventis* merger quoted above, the term 'future markets' was used. In the *Upjohn/Pharmacia* merger, the Commission used the term 'R&D markets'.⁴⁹ In the 2011 horizontal co-operation Guidelines, 'Competition in innovation (R&D efforts)' is used to describe competition in innovation and new product markets.⁵⁰ In the *Microsoft* case regarding abuse of a dominant position, the court held that Microsoft's behaviour had a negative impact on innovation.⁵¹

The purpose of this thesis is to examine the stance taken towards barriers to entry in innovation and R&D. With the rather blurry line between potential competition and competition in innovation, it is not possible to analyse innovation and R&D in relation only to the one or the other concept. Therefore, the scope of this thesis will embrace competition in innovation and R&D without defining a clear line between potential competition and competition in innovation.⁵²

3.2 Market definitions

The purpose of establishing a relevant market is a key to distinguish and delimit the products or R&D efforts that act as competitive constraints on firms.⁵³ In the words of Bishop and Walker, '[...] the relevant market seeks to restrict attention only to those products or services which have a "significant" impact on competition.'⁵⁴ Accordingly, relevant market definition is critical for conferring dominance to a company.⁵⁵ Therefore, defining the relevant market is the starting point for all competition analysis.

⁴⁹ Case No IV/M.631 – *Upjohn/Pharmacia*, 1995, para 25

⁵⁰ Commission Notice: *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, OJ C 11/1 [2011], para 119

⁵¹ *Microsoft Corp v. Commission of the European Communities*, Case T-201/04, [2007] ECR II-3601, para 1088

⁵² S. Bishop & M. Walker, *The Economics of EC Competition Law*, 4-044

⁵³ Commission Notice: *on the definition of relevant market for the purposes of Community competition law* OJ C 372 [1997], para 2

⁵⁴ S. Bishop & M. Walker, *The Economics of EC Competition Law*, 4-002

⁵⁵ *Europemballage Corp and Continental Can Inc v. Commission*, Case 6/72, [1973] ECR 215, [1973] CMLR 199, para 32

Defining a relevant market is a difficult task and has been much debated in the EU legal order. Numerous court rulings has dealt with market definitions⁵⁶ and books have been written on this matter alone. A thoroughly investigation of the definition of relevant markets will not improve the quality of this work. At the same time a shorter explanation is in order to understand the concept of relevant markets. In connection to this, the concept of innovation markets will be explained in length to provide the pertinent legal background for the upcoming assessment of barriers to entry in innovation and R&D.

3.2.1 Relevant markets

The relevant market is primarily defined in the Commission Notice on the definition of relevant market. The purpose of the notice is to provide guidance to the Commission's approach to establish the relevant product and geographic market.⁵⁷ The purpose of establishing a relevant market is to define the competitive constraints incumbents face.⁵⁸

In the Guidelines for horizontal co-operation agreements, in the chapter for the assessment of R&D agreements, three markets have been established to be of importance, as follows; existing product markets, existing technology markets and competition in innovation (R&D efforts).⁵⁹ This delineation serves as a pertinent tool for defining the relevant markets when analysing competition in innovation and R&D.

⁵⁶ see for instance *Europemballage Corp and Continental Can Inc v. Commission*, Case 6/72, [1973] ECR 215, [1973] CMLR 199, *United Brands Co. v. Commission*, Case 27/76 [1978] ECR 207, *Nederlandsche Banden Industrie Michelin (Michelin I) v. Commission*, case 322/81 [1983] ECR 3461, *Hoffmann-La Roche & Co. AG v. Commission*, Case 85/76 [1979] ECR 461, *Hilti AG v. Commission*, Case T-30-89, [1991] ECR-II and *British Airways plc v. Commission*, Case T-219/99, [2004], 4 CMLR 1008.

⁵⁷ Commission Notice: *on the definition of relevant market for the purposes of Community competition law* OJ C 372 [1997], para 1

⁵⁸ *ibid*, para 2

⁵⁹ Commission Notice: *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, OJ C 11/1 [2011], Chapter 3

3.2.1.1 Product and geographical markets

The primary method of establishing the relevant market is to define the product and geographical markets.⁶⁰

The relevant product market is defined as follows:

*'A relevant product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer, by reason of the products' characteristics, their prices and their intended use.'*⁶¹

The relevant geographical market is defined as:

*'The relevant geographic market comprises the area in which the undertakings concerned are involved in the supply and demand of products or services, in which the conditions of competition are sufficiently homogeneous and which can be distinguished from neighbouring areas because the conditions of competition are appreciably different in those area.'*⁶²

By establishing the relevant market, dominance and competitive constraints can be established, usually with the help of market shares.⁶³ Although much can be said in relation to the establishment of product markets and geographical markets, these are of limited interest for this thesis, and will not be touched upon any further. However, the concepts of dominance and constraints will be returned to further in this thesis.

3.2.1.2 Innovation markets

The innovation market approach is a rather new invention in the EU legal order. Despite a shaky start, it is now an accepted concept and is an integrated part of competition law. In January 2011, the Commission issued Guidelines on horizontal co-operation agreements with the innovation market listed as a relevant market.⁶⁴

As a point of departure, it is of vital importance to provide a thorough background and explanation of the innovation market approach and its debates.

⁶⁰ Commission Notice: *on the definition of relevant market for the purposes of Community competition law* OJ C 372 [1997], para 4

⁶¹ *ibid*, para 7

⁶² *ibid*, para 8

⁶³ *ibid*, para 53-55

⁶⁴ Commission Notice: *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, OJ C 11/1 [2011], para 119-122

3.2.1.2.1 The innovation market invention in the US legal order

An innovation market was defined for the first time in the US Antitrust Guidelines for the Licensing of Intellectual Property from 1995:

*'An innovation market consists of the research and development directed to particular new or improved goods or processes, and the close substitutes for that research and development. The close substitutes are research and development efforts, technologies, and goods that significantly constrain the exercise of market power with respect to the relevant research and development, for example by limiting the ability and incentive of a hypothetical monopolist to retard the pace of research and development. The Agencies will delineate an innovation market only when the capabilities to engage in the relevant research and development can be associated with specialized assets or characteristics of specific firms.'*⁶⁵

The definition seeks to establish a relevant (innovation) market where an undertaking might exert pressure to be able to limit and retard R&D efforts, weakening competition to the detriment of consumers. The innovation market definition is therefore a reaction to when competition analysis only limits itself to analysing existing markets.⁶⁶

3.2.1.2.2 Innovation market - a debated concept

The innovation market approach was met with scepticism by the US legal order. In the mid 1990's the Antitrust Law Journal held a symposium called 'A Critical Appraisal of the "Innovation Market" approach'.⁶⁷ A number of critical articles emanated from this symposium. One of the participants, Richard T. Rapp, argued the innovation market approach to be superfluous and just a new way of talking about potential competition.⁶⁸ Expanding his argument, he noted that there is no 'positive functional relationship between the rate of R&D expenditure (or the amount of R&D capacity) and the quantum of innovation produced by a firm'.⁶⁹ This argument is supported by economists Bishop and Walker who note that R&D is an input, not an output and thus points to the weak correlation between R&D expenditure and the speed of innovation.⁷⁰

⁶⁵ 1995 US Antitrust Guidelines for the Licensing of Intellectual Property, para 3.2.3.

⁶⁶ Marcus Glader, *Innovation Markets and Competition Analysis – EU competition law and US antitrust law*, p. 6, and S. Bishop & M. Walker, *The Economics of EC Competition Law*, 4-043

⁶⁷ The outcome of this symposium can be found in *Antitrust Law Journal*, Vol. 64, 1995-1996, p. 1-266

⁶⁸ Richard T. Rapp, 'The Misapplication of the Innovation Market approach to Merger analysis', *Antitrust Law Journal*, Vol. 64, 1995-1996, p. 20

⁶⁹ *ibid*, p. 27

⁷⁰ S. Bishop & M. Walker, *The Economics of EC Competition Law*, 4-044

In Europe, John Temple Lang⁷¹ suggested in 1997 that '[i]f there is "a market for R&D," it is only if companies are selling the service of providing R&D to other companies'.⁷² Despite the argument presented by Richard T. Rapp, John Temple Lang asserted in his article that restriction on competition in R&D was something different than potential competition in EU competition law.⁷³

3.2.1.2.3 The European road to the innovation market approach

The innovation market approach has gradually developed in the EU legal order. Even though the definition of an innovation market became a reality only in 1995 through the US Antitrust Guidelines for the Licensing of Intellectual Property, the method of analysing competition with regard to innovation and R&D was employed before that date. The road from a rather tentative approach to a more mature innovation market approach will be outlined through a selection of relevant merger cases and doctrinal development.

In 1986 the Commission had to decide on a case where the US company Corning, engaged in the manufacture and development of optical fibres, sought to form JVs with a number of European cable manufacturers.⁷⁴ The concern of the Commission was the licensing and grant back of technology from the JVs to the originating mother company. The Commission stated that the licensees (the JVs) often develop their licensed products in different directions and that the obligation to grant back any developments made to the mother company, reduced competition between the JVs because technology was a key component in the optical fibres industry.⁷⁵ None of the JVs were in a position to gather any innovative advantage over the other JVs and accordingly the Commission had concerns that the technological development would become more standardized with negative impact on future innovations.⁷⁶

In 1996, the Commission referred to the importance of future markets analysis in the *Ciba-Geigy/Sandoz* merger, and stated the need to investigate the parties research activities regarding gene therapy and brain tumours.⁷⁷ The research included pipeline products not yet on the market, but in an advanced stage of development.

⁷¹ at the time Director at DG Comp.

⁷² Temple Lang, John, 'European Community Antitrust Law: Innovation Markets and High Technology Industries', 20 *Fordham International Law Journal*, 717 (1997), at page 764.

⁷³ *ibid*, p. 760-761

⁷⁴ Case No IV/30.320 – *Optical Fibres*, 1986

⁷⁵ *ibid*, para 50

⁷⁶ Marcus Glader, *Innovation Markets and Competition Analysis – EU competition law and US antitrust law*, p. 115-116

⁷⁷ Case No IV/M.737 – *Ciba-Geigy/Sandoz*, 1997, para 44

John Temple Lang observed in 1997 that the Commission had not defined an innovation market in the same way the FTC in the United States had done, but at the same time he acknowledged proximities on how the Commission analysed R&D cases compared to the FTC.⁷⁸

Lang made clear that the Commission would acknowledge competition in R&D 'only where the competition between the firms in question is the leading research in the field [...] and [...] is directed specifically towards improving the same product or process, and is associated with specialized R&D programs of those firms.'⁷⁹

Two years after the Temple Lang article, in the 1999 Hoechst-case, the Commission stated that '[t]he Commission has to look at R&D potential in terms of its importance for existing markets, but also for future market situations'.⁸⁰

In the *Glaxo Wellcome/SmithKline Beecham* merger, the Commission decided on the proposed merger under a Future Markets heading.⁸¹ The structure of the competitive situation in the pharmaceutical sector prompted the Commission not only to analyse existing products, but also research programmes on products not yet on the market.⁸² These research programmes were referred to as pipeline products, but still in a stage of development.⁸³ It was seen as essential for the transaction to assess the impact on existing markets and on R&D markets.⁸⁴

In 2001, the Commission released Guidelines on horizontal cooperation, where it expanded its view on competition in innovation.⁸⁵ Competition in innovation was concluded to be the case where co-operation concerned the development of new products/technology to replace existing products or create new demand. The guidelines delineated competition in innovation from actual or potential competition in product or technology markets. Finally in 2004, the Commission made use of the notion *innovation markets* in a new set of guidelines regarding technology transfer.⁸⁶

⁷⁸ Temple Lang, John, 'European Community Antitrust Law: Innovation Markets and High Technology Industries', 20 *Fordham International Law Journal*, 717 (1997), p. 760-765

⁷⁹ *ibid*, p. 760

⁸⁰ Case No IV/M.1378 – *Hoechst/Rhône-Poulenc*, 1999, para 26

⁸¹ Case COMP/M.1846 – *Glaxo Wellcome/SmithKline Beecham*, 2000

⁸² *ibid*, para 71

⁸³ *ibid*, para 70

⁸⁴ *ibid*, para 174

⁸⁵ Commission Notice: *Guidelines on the applicability of Article 81 of the EC Treaty to horizontal cooperation agreements*, OJ C 3/2 [2001], para 50-52

⁸⁶ Commission Notice: *Guidelines on the application of Article 81 of the EC Treaty to technology transfer agreements*, OJ C 101/2 [2004], para 25

Returning to the 2001 guidelines, the Commission identified innovation markets as regarding R&D poles. The method focuses on industries where R&D poles are identifiable at an early stage of the innovative process, thus making it ideal for analysing cases in the pharmaceutical sector. According to the Commission, R&D poles are

*'R&D efforts directed towards a certain new product or technology, and the substitutes for that R&D, i.e. R&D aimed at developing substitutable products or technology for those developed by the cooperation and having comparable access to resources as well as a similar timing. In this case, it can be analysed if after the agreement there will be a sufficient number of R&D poles left. [...]. In order to assess the credibility of competing poles, the following aspects have to be taken into account: the nature, scope and size of possible other R&D efforts, their access to financial and human resources, know-how/patents, or other specialised assets as well as their timing and their capability to exploit possible results. An R&D pole is not a credible competitor if it can not be regarded as a close substitute for the parties' R&D effort from the viewpoint of, for instance, access to resources or timing.'*⁸⁷

In January 2011, new guidelines regarding horizontal co-operation agreements confirmed the above definition in the 2001 guidelines.⁸⁸

Where the US definition of innovation market approach focuses on 'specialised assets', the EU approach focuses on 'R&D poles'. It can be argued that the EU approach is narrower, pointing out the actual asset (R&D poles) as relevant. At the same time, US case law⁸⁹ indicates that the approach will often focus on R&D poles in a similar manner, as has been the case in Europe. In my opinion, the two approaches are equal to one another.

⁸⁷ Commission Notice: *Guidelines on the applicability of Article 81 of the EC Treaty to horizontal cooperation agreements*, OJ C 3/2 [2001], para 51

⁸⁸ Commission Notice: *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, OJ C 11/1 [2011], para 119-122

⁸⁹ see e.g. *Amgen inc. and Immunex Corporation*, FTC, File No. 021 0059, Docket No. C-4056 (2002), where the FTC under heading V. in the Complaint, investigated overlaps in research projects and pipeline products between the merging companies.

3.2.1.3 Technology markets

Touched upon indirectly in this thesis, competition law often borders the field of intellectual property rights⁹⁰. The difficulties of drawing the line between protecting competition and protecting IPRs will be explained below. IPRs have produced a field of law regarding technology markets, relating to when IPRs are marketed separately from the products to which they relate.⁹¹ A technology market, therefore, consists of the licensed IPR and its close substitutes. Defining a technology market is conducted in the same way as product market definition.

Even if assessing technology markets and IPRs is not within the scope of this thesis, a few lines are still needed to place these peculiarities in their context of competition in innovation and R&D.

IPRs refer to those rights that are sprung from the human intellect. They are usually grouped into patents, copyrights, trademarks and designs. They are to a various degree protected by law in most countries and usually confer on the holder an exclusive right to exploit the IPR.⁹² The purpose of IPRs is to protect creators and ensure they can reap the financial benefits of their inventions. By ensuring the creator the benefits of their work, the protection creates an incentive for innovation.⁹³

IPRs have always had a complex relationship to competition law. Three reasons can be attributed to creating difficulties in the relationship between IPRs and competition law.⁹⁴ First, despite lengthy attempts to create EU IPRs,⁹⁵ the main route to IPR protection is still through national legislation, whereas competition law is an EU matter. Further, IPRs are often licensed from one undertaking to another, making them subject to Art 101 TFEU analysis.⁹⁶ Thirdly, IPRs may raise barriers to entry and an undertaking may be investigated regarding abuse of a dominant position pursuant to Art 102 TFEU.

⁹⁰ From here on referred to as IPR.

⁹¹ Commission Notice: *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, OJ C 11/1 [2011], para 116-118

⁹² A. Jones & B. Sufrin, *EC competition law – text, cases and materials*, 3rd ed, 2008 Oxford, p. 772-774

⁹³ *ibid*, p. 772-773

⁹⁴ *ibid*, p. 773

⁹⁵ for instance, the EU has been working over a decade to create an EU patent without succeeding. Commission press release ref: IP/10/1714, 2010-12-14, *Patents - Commission opens the way for some Member States to move forward on a unitary patent*.

⁹⁶ see Commission Regulation (EC) No 772/2004 of 27 April 2004 on the application of Article 81(3) of the Treaty to categories of technology transfer agreements.

Patents relate to inventions and confer a right on the holder to prevent others from making, disposing of, using or importing a product which is protected by a patent.⁹⁷ A patent is a legal monopoly and accordingly creates an entry barrier for competitors who wish to enter a new market which is subject to patents protection. Those other than the patent holder who wish to utilize the patented product commercially must acquire a licence or wait for the patent to expire. Patents are usually protected for a maximum of twenty years in the EU through the European Patent Convention.⁹⁸

The fundamental debate regarding the relationship between IPRs and competition law is whether they are in conflict with each other or if they share the same goal. Luc Peeperkorn⁹⁹ expressed that IPRs and competition law goals are complementary since they both promote consumer welfare.¹⁰⁰ The aim with IPRs is not to protect the innovator's welfare. Only with regard to individual cases, adjustments between the two sources of law might be necessitated.¹⁰¹ In the *Astra Zeneca* case regarding abuse of a dominant position, the Commission held that Astra Zeneca's patent protections was relevant for its position on the market vis-à-vis competitors and thus for the assessment on dominance.¹⁰² At the same time it must be emphasised that the proprietorship of an IPR does not per se constitute an abuse.

The relationship between competition law and IPR law is often highlighted in barriers to entry analysis regarding R&D and innovation. A patent constitutes a monopoly and creates an entry barrier. Consequently patents are frequently considered as barriers to entry in EU competition law.¹⁰³ Despite being an interesting and debated field of law, it is not within the scope of this thesis and will not be examined further.

⁹⁷ A. Jones & B. Sufrin, *EC competition law – text, cases and materials*, 3rd ed, 2008 Oxford, p. 774

⁹⁸ European Patent Convention, 14th edition, 2010, Art 63

⁹⁹ a DG Comp official in 2003

¹⁰⁰ Luc Peeperkorn, 'IP licences and Competition Rules: Striking the Right Balance', *World Competition*, Vol 26, issue 4, (2003), p. 527-528

¹⁰¹ *ibid*, p. 528

¹⁰² [redacted] 2005, para 534

¹⁰³ see e.g. [redacted] 2005

3.3 Market power, dominance and competitive constraints

Once the relevant market is defined, it is possible to establish dominance.

In the important *United Brands* case, the ECJ stated that a dominant position refers to a position of economic strength enjoyed by an incumbent on a relevant market, which will enable that undertaking to act to an appreciable extent independently of its competitors, customers and ultimately of their consumers.¹⁰⁴ This definition developed through the *Hoffmann-La Roche* case where the ECJ emphasised that dominance did not preclude some competition and pinpointed the ability by the dominant player to influence the conditions for competition on the market.¹⁰⁵ When analysing distortions of effective competition on a relevant market, the main characteristic is market power.¹⁰⁶

Market shares provide a first indication to whether a company holds market power,¹⁰⁷ but it is not the sole determinant. Even if an undertaking is enjoying large market shares, it may still be easy for competitors to enter the market, and hence no market power should be conferred on the incumbent. Market shares must be interpreted in the light of market conditions and the dynamics of the particular market.¹⁰⁸ Market shares are only proof of the current state of competition.¹⁰⁹ To confer market power to an undertaking it must be able to hold that market position for a significant period of time.¹¹⁰ The economists Bishop and Walker identifies market power as 'the ability of firms to increase prices profitably above the competitive price for a sustained period'.¹¹¹

Market power concerns how a firm can lever their dominant position to their own advantage. Accordingly, a company can influence several parameters on the market beside price.¹¹² Profitability is not the sole determinant for market power.¹¹³

¹⁰⁴ *United Brands Co. v. Commission*, case 27/76 [1978] 1 CMLR 429, para 65

¹⁰⁵ *Hoffmann-La Roche & Co. AG v. Commission*, case 85/76 [1979] ECR 461, para 38-39

¹⁰⁶ S. Bishop & M. Walker, *The Economics of EC Competition Law*, 3-001

¹⁰⁷ *Hoffmann-La Roche & Co. AG v. Commission*, Case 85/76 [1979] ECR 461, para 40-41

¹⁰⁸ *Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings*, OJ C 45/02 [2009], para 11

¹⁰⁹ A. Jones & B. Sufrin, *EU competition law – text, cases and materials*, 4th ed, 2010 Oxford, p. 84

¹¹⁰ *Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings*, OJ C 45/02 [2009], para 11

¹¹¹ S. Bishop & M. Walker, *The Economics of EC Competition Law*, 3-001

¹¹² *Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings*, OJ C 45/02 [2009], para 11

¹¹³ *United Brands Co. v. Commission*, case 27/76 [1978] 1 CMLR 429, para 126

When assessing competition in innovation and R&D, market shares provide little guidance to the state of competition for future products as market shares measure what has happened in the past. This entails alternative market power definitions. For the purpose of this thesis, market power is defined as a company's ability to reduce the pace of innovation below competitive levels.¹¹⁴

The ability to act independently on a market relates to the competitive constraints in relation to a dominant position. Dominance is the absence of sufficient competitive constraints, conferring market power on the dominant undertaking, over a period of time.¹¹⁵ The lack of constraints entails a situation where the dominant undertaking's decisions are insensitive to the reactions of its competitors, customers and consumers.

Constraining factors relate directly to entry barriers. An undertaking's attempt to exercise market power can be offset by a competitor entering the market. If entry is easy, the incumbent will not be able to charge monopoly prices, or as discussed in this thesis, not able to slow down R&D and innovation to the detriment for customers and consumers. Inversely, if market entry is difficult the incumbent has the power to slow down innovation and R&D. Market power is consequently dependent on market entry. A company can exercise market power only if barriers to entry exists.¹¹⁶ Even a potential entry can have a constraining effect on an incumbent, without actually entering the market.¹¹⁷

According to standard competition theory, there are three sources of competitive constraints. Demand substitution, supply substitution and potential competition.¹¹⁸ Demand substitution is the situation where consumers exercise constraints on an incumbent's behaviour on a relevant product market by considering a number of products interchangeable.¹¹⁹ Supply substitution is when suppliers have the ability to switch its production with little cost or risk in response to a small increase in price on the relevant market and thereby constraining the incumbent's behaviour.¹²⁰

¹¹⁴ Commission Notice: *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, OJ C 11/1 [2011], para 39 and *Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings*, OJ C 45/02 [2009], para 11, Commission Notice: *Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings*, OJ C 31/3 [2004], para 8. See also S. Bishop & M. Walker, *The Economics of EC Competition Law*, 4-043

¹¹⁵ *Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings*, OJ C 45/02 [2009], para 10

¹¹⁶ *ibid*, para 16-17

¹¹⁷ S. Bishop & M. Walker, *The Economics of EC Competition Law*, 3-020

¹¹⁸ Commission Notice: *on the definition of relevant market for the purposes of Community competition law* OJ C 372 [1997], para 13

¹¹⁹ *ibid*, para 15-19

¹²⁰ *ibid*, para 20-23

The third category of constraint is connected to competition in innovation and R&D. It regards the situation where a potential competitor acts as a constraining factor on an incumbent's behaviour. Potential competition is consequently dependent on factors and conditions related to entry.¹²¹

It is time to change the focus from the legal aspects of competition in innovation and R&D, to the economic aspects, namely the definition of barriers to entry.

¹²¹ *ibid*, para 24

4 Barriers to entry

4.1 The economic context

Barriers to entry analysis is an important analytical tool in the aim to prevent dominant undertakings to stifle competition and acknowledged as a valid analytical method when assessing competitive constraints. It is listed in the merger regulation as a method in appraisal of mergers,¹²² has been employed in court rulings regarding abuse of a dominant position¹²³ and is widely regarded as a useful tool for competition law analysis within the legal academia.

Barriers to entry theory in the EU legal order can be seen in the light of the debate and criticism regarding the Commission's and occasionally the courts' method of interpreting competition law. The economists Bishop and Walker has criticized the Commission for applying a too formalistic approach to competition law that seem to disregard economic reality and the need to establish market power to find anti-competitive effects.¹²⁴ Korah has been another strong opponent of the Commission's and the courts' paucity of economic analysis.¹²⁵ In *the European Night Services* case, the General Court rejected the Commission decision for not defining the transport market in a proper way.¹²⁶

Some factors the Commission has considered to be anti-competitive is related to economic efficiency, for instance economies of scale.¹²⁷ All together, the criticisms have expressed a meaning that the EU judicature has employed a too broad and interventionist approach of what constitutes competitive distortions, failing to a sufficient extent to employ economic theory in its enforcement of competition law.¹²⁸

¹²² Council regulation 139/2004, on the control of concentrations between undertaking, Art 2 (1) (b), Commission Notice: *Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings*, OJ C 31/3 [2004], para 68-75

¹²³ *Microsoft corp. v. Commission of the European Communities*, Case T-201/04, [2007] ECR II-3601

¹²⁴ S. Bishop & M. Walker, *The Economics of EC Competition Law*, 5-002 to 5-005

¹²⁵ Valentine Korah, *An introductory Guide to EC Competition Law and Practice*, 9th edition, 2007 Oxford, chapter 14.1.1

¹²⁶ *European Night Services*, Cases T-374-5, 384 and 388/94, [1998] ECR II-3141

¹²⁷ *Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings*, OJ C 45/02 [2009], para 16-17

¹²⁸ Richard Whish, *Competition Law*, 6th edition, 2009 Oxford, p. 2

4.2 Barriers to entry in the EU legal order

As mentioned earlier, barriers to entry in its widest sense can be said to consist of 'factors that prevent or hinder companies from entering a specific market.'¹²⁹

In the 2004 horizontal merger Guidelines, the Commission expound its view of what constitutes barriers to entry for the purpose of merger analysis.¹³⁰ Entry must be *likely, timely* and *sufficient* to be considered as a competitive constraint on incumbents. The likelihood of entry is affected by different factors.

Sufficient profitability post entry is stated to make entry by potential competitors more likely. Post entry profitability analysis includes the expected evolution of the market, since markets with potential growth is more likely to return a positive profitability for potential entrants.¹³¹ A second determinant for likely entry is the prospect of incumbents concluding long-term supply agreements with customers as a means to raise entry barriers. Finally, high sunk costs is considered, by the Commission, to be important as it raises the risk of market entry failure for potential competitors.¹³² The size of sunk costs is arguably the most important factor for entry into innovation and R&D intensive industries.

Entry barriers in the merger guidelines considered to consist of legal and technical advantages, access to essential facilities, natural resources, innovation and R&D as well as incumbents' established position on the market. Incumbents' market position translates into consumer loyalty and other factors relating to its reputation.¹³³

The prerequisite of timeliness regards the assessment of whether entry is swift enough to deter or defeat market power exercise. The time period is dependent on market characteristics, but entry is normally considered timely if it takes place within a two year period.¹³⁴

The scope and magnitude of potential entry must be sufficiently large to be considered as a constraint on an incumbent.¹³⁵ Entry only by a niche market is not considered to have a deterring effect on incumbents' behaviour.

¹²⁹ European Commission: *Glossary of terms used in competition policy*

¹³⁰ Commission Notice: *Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings*, OJ C 31/3 [2004], para 68-75

¹³¹ *ibid*, para 69 and 72

¹³² *ibid*, para 69

¹³³ *ibid*, para 71

¹³⁴ *ibid*, para 74

¹³⁵ *ibid*, para 75

Albeit not as clearly spelled out in the horizontal co-operation agreements guidelines as in the horizontal merger guidelines, the Commission seems to argue along the same line that entry must be *likely, timely* and *sufficient* to be considered as a sufficient competitive constraint on incumbents.¹³⁶

The same arguments, that entry must be *likely, timely*, and *sufficient* is used in the Commission's enforcement priorities Guidance Paper regarding abusive conduct.¹³⁷

From these three different guidelines it is clear that the Commission has created a method of analysing barriers to entry and that this method seem to be reasonably consistent, irrespective if being employed for ex-ante or ex-post analysis. At the same time, it is fair to note that the scope of what constitutes barriers to entry in the eyes of the Commission is very wide.

In connection to this, it must be taken into account that barriers to entry has been a debated concept among economists for a long time. As much as it is a definition on constraining factors relating to market power, it is at the same time a political standpoint. Depending on the definition employed, the willingness for authorities to interfere in the competitive process will either be far-reaching or negligible. It is therefore vital to return to the basic economic theory regarding the economics in competition and barriers to entry in order to provide guidance for further barriers to entry analysis.

4.3 Economic efficiency

Economic efficiency relates to the maintenance of effective competition. Therefore, competition is an economic objective,¹³⁸ where the purpose of competition law is to produce economic welfare.¹³⁹ The argument is that competition brings welfare to a state by allocating resources and producing as efficient as possible. This leads to cost efficiency, low prices and innovation.¹⁴⁰ The UK Competition Commission has described competition as 'a process of rivalry between firms [...] seeking to win customers' business over time'.¹⁴¹ The aim to maintain efficient competition on the market is a general value shared by both TFEU Art 101 and Art 102.

¹³⁶ Commission Notice: *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, OJ C 11/1 [2011], para 45-47

¹³⁷ *Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings*, OJ C 45/02 [2009], para 16-17

¹³⁸ S. Bishop & M. Walker, *The Economics of EC Competition Law*, 1-002.

¹³⁹ J. Goyder & A. Albers-Llorens, *Goyder's EC Competition Law*, p 11

¹⁴⁰ S. Bishop & M. Walker, *The economics of EC competition Law*, 2-001

¹⁴¹ Merger references, *Competition Commission Guidelines* June 2003, para 1.20

Perfect competition is the concept where the market structure is considered optimal. A perfect market refers to static efficiency, an equilibrium where resources are allocated and used in an optimal way.¹⁴² Static efficiency is based on given technologies and price, a theory where neither history nor future exists.¹⁴³ This is the case when the product is homogeneous, the market comprises of a large number of both buyers and sellers with no market power and everybody is in the possession of perfect information, acting rationally upon this information.¹⁴⁴ Even though such a perfect market does not exist, the model serves as a benchmark when analysing markets.

In a market set by perfect competition there is allocative efficiency and productive efficiency. Allocative efficiency is achieved when goods are allocated to the customers who value them the most, expressed as the willingness to pay the asked price.¹⁴⁵ Allocative efficiency achievement means that price equal the real resource cost of producing. Productive efficiency focuses on a particular firm or industry and is decided by resource price. Efficiency is achieved when the combination of resources is the most efficient that can keep the lowest production cost.¹⁴⁶

The innovative process does not correspond to the certainty the static model demands. It is characterised by uncertainty and asymmetric information.¹⁴⁷ This is where the model of dynamic efficiency comes into play. Dynamic (or innovation) efficiency in competition economics relates to whether the proper incentives and ability to engage in innovative activity are at hand.¹⁴⁸ It regards situations evolving over time, where new products and technologies create high market shares and even temporary monopolies.¹⁴⁹

¹⁴² Marcus Glader, *Innovation Markets and Competition Analysis – EU competition law and US antitrust law*, p. 32

¹⁴³ *ibid*, p. 33

¹⁴⁴ A. Jones & B. Sufrin, *EC competition law – text, cases and materials*, 3rd edition, 2008 Oxford, p. 7

¹⁴⁵ Miguel de la Mano, 'For the customer's sake: the competitive effects of efficiencies in European merger control', *Enterprise Papers No. 11* (2002 Enterprise Directorate-General), chapter 1.3.1

¹⁴⁶ *ibid*, chapter 1.3.1

¹⁴⁷ Marcus Glader, *Innovation Markets and Competition Analysis – EU competition law and US antitrust law*, p. 33

¹⁴⁸ Miguel de la Mano, 'For the customer's sake: the competitive effects of efficiencies in European merger control', *Enterprise Papers No. 11* (2002 Enterprise Directorate-General), chapter 1.3.1

¹⁴⁹ Marcus Glader, *Innovation Markets and Competition Analysis – EU competition law and US antitrust law*, p. 34 and A. Jones & B. Sufrin, *EC competition law – text, cases and materials*, 3rd edition, 2008, Oxford, p. 11

Indeed, this dynamic process was acknowledged by Harvard University economist Joseph Schumpeter who considered that a monopolist might have stronger incentives to innovate due to lower risk, thus acting as a spur to technological change and a driving force in competition.¹⁵⁰ Schumpeter recognized competition in innovation being more effective than competition in price because this is where a company could obtain an advantage over its competitors. This 'Schumpeterian rivalry' is a process where firms compete by bringing new products to the market, holding short-term market power since competitors constantly innovate new and better products.¹⁵¹

Economic efficiency is both static efficiency and dynamic efficiency. The distinction between the two can be expressed as the latter being based on an idea that efficiency relates to a firm's ability to innovate, thus leading to improvements of existing products or development of new products.¹⁵²

The notion of economic efficiency suggests a close relationship between a market's structure and its economic performance.¹⁵³ Therefore economic efficiency constitutes an analytical tool to evaluate industry performance and accordingly explain when interfering in the competitive process is reasonable and when it is not. The use of economic efficiency as a tool for competition analysis corresponds at the same time to the political battleground regarding the method to fulfil the objectives of competition law,¹⁵⁴ where the Harvard school of thought advocates protection of the competitive process and where the Chicago school of thought advocates economic efficiency being the sole goal for competition law.

4.4 Harvard School of thought

The Harvard school of thought refers to work done mainly at Harvard University and is based on empirical studies of American industries in the 1950s. The studies arrived at the conclusion that it is the structure of the market that dictates companies' performance. The studies resulted in the S-C-P paradigm, *Structure – Conduct – Performance*.

¹⁵⁰ Joseph Schumpeter, *Capitalism, socialism and democracy*

¹⁵¹ A. Jones & B. Sufrin, *EC competition law – text, cases and materials*, 3rd ed, 2008 Oxford, p. 15

¹⁵² Miguel de la Mano, 'For the customer's sake: the competitive effects of efficiencies in European merger control', *Enterprise Papers No. 11* (2002 Enterprise Directorate-General), chapter 1.3.1

¹⁵³ D. Chalmers et al, *European Union Law*, 2nd edition, 2010 Cambridge, p. 911

¹⁵⁴ *ibid*, p. 915-918

J.S. Bain, one of the leading Harvard school economists, defined barriers to entry as '[t]he extent to which, in the long run, established firms can elevate their selling prices above the minimal average costs of production and distribution (those costs associated with operation at optimal scales) without inducing potential entrants to enter industry'.¹⁵⁵ The Bain definition centers around a firm's ability to make excess profits.

The conclusion, that market structure dictates performance, set the focus on structural remedies rather than behavioural ones.¹⁵⁶ In order to protect the competitive structure of the market, it is important to prevent undertakings from becoming dominant. The Harvard school approach entails an interventionist approach to competition.

4.4.1 The S-C-P paradigm

The S-C-P paradigm has had a crucial impact on competition law enforcement in Europe. Developed by J.S. Bain among others in the 1950's,¹⁵⁷ the S-C-P paradigm suggests a causal link between the structure of the market, which determines the firms' conduct (their competitive behaviour), which in turn leads to the firms' performance (profitability).¹⁵⁸ The S-C-P model advocates a competition law approach focusing on market structure, rather than the behaviour of the market players.¹⁵⁹

At the same time, the S-C-P model tells us little of what shapes the market structure. Behavioural factors, such as R&D, can change the structure of the market, for instance by creating a new generation of products with lower costs.¹⁶⁰ Conduct is therefore not only a result of the structure of the market, but is in itself a variable affecting the structure of the market.¹⁶¹ Although barriers to entry usually refers to the structure of the market, the reversed S-C-P paradigm opens up for analysing market conduct. The Bainian definition of barriers to entry analysis is a pertinent tool for analysing competition in innovation and R&D since it will explain the incentives for an incumbent to behave in a certain way in order to change the structure of the market.

¹⁵⁵ J.S. Bain, *Industrial organization*, 2nd ed, 1968, New York, p. 252

¹⁵⁶ A. Jones & B. Sufrin, *EC competition law – text, cases and materials*, 3rd ed, 2008 Oxford, p. 22

¹⁵⁷ J.S. Bain, *Industrial organization*

¹⁵⁸ S. Bishop & M. Walker, *The Economics of EC Competition Law*, 3-014

¹⁵⁹ *ibid*, 3-014

¹⁶⁰ *ibid*, 3-014

¹⁶¹ *ibid*, 3-015

This reverse analysis of structure-conduct-performance can be seen in the light of two important factors that will affect a potential competitor's decision to enter a new market. The first one is sunk costs, i.e. unrecoverable costs connected to market entry. The other factor is the expected post-entry profitability. For a given level of post-entry competition, the greater the sunk costs are for entry, the likelihood of entry decreases.¹⁶² The relevant market becomes less profitable as a consequence of raised unrecoverable entry costs and thus less attractive for entry. This gives scope for incumbent firms to engage in strategic entry-detering behaviour, acting to raise the level of unrecoverable sunk costs potential entrants need to induce for market entry.¹⁶³ For instance in innovation intensive markets such as the pharmaceutical sector, where identifiable R&D poles is assessed and with the transparency such an approach entails, it opens up incentives for incumbents to try to influence the size of unrecoverable sunk costs.

4.5 Chicago School of thought

The Chicago school of thought can be described as a reaction to the interventionistic market approach advocated by Harvard adherents. The Chicago school of thought is a free-market approach which advocates as little market intervention as possible. It only acknowledges economic efficiency as a goal for competition law and it is irrelevant if the efficiency is achieved by dominant players on the market.¹⁶⁴ The Chicago school approach is a self regulating market because a monopoly company making excessive profits is considered to attract new entry into the monopolist market and hence market power is set to vanish.¹⁶⁵ Overall, the Chicago school does not see particular problems with market concentrations as a large undertaking will be able to exploit economies of scale, making them the most efficient market players.¹⁶⁶ Chicago adherents sees national legislation as the main reason as to why market entry is obstructed.¹⁶⁷

Stigler, an influential Chicago economist, defined barriers to entry as 'a cost of producing [...] which must be borne by a firm which seeks to enter the industry but is not borne by firms already in the industry'.¹⁶⁸ The scope to what might constitute barriers to entry is much narrower with Stigler's definition, compared to the Banian counterpart.

¹⁶² *ibid*, 3-020

¹⁶³ *ibid*, 3-021

¹⁶⁴ D. Chalmers et al, *European Union Law*, p. 913

¹⁶⁵ H. Hovenkamp, 'Antitrust policy after Chicago', *Michigan Law Review*, Vol 84 No. 2 [1985], p. 227

¹⁶⁶ D. Chalmers et al, *European Union Law*, p. 913

¹⁶⁷ *ibid*, p. 913

¹⁶⁸ S. Bishop & M. Walker, *The Economics of EC Competition Law*, 3-024

The Chicago school of thought, by placing economics in the middle of competition theory, views the market as being self-regulating. Accordingly the Chicago view relates to perfect competition and allocative efficiency and product efficiency.¹⁶⁹

However, the Chicago school's confidence in the market to self regulate eventually got questioned even by their own adherents. This has led to a post-Chicago school of thought. Jacobs expresses it as 'while Chicagoans presuppose that markets promote efficient business behavior and that judges untrained in economics are ill-equipped to identify and measure market imperfections, post-Chicagoans have less trust in markets and more confidence in the judiciary's ability to distinguish between competitive and anticompetitive conduct'.¹⁷⁰ Market failures are not necessarily self correcting and firms will take advantage of market imperfections such as information gaps or a competitors sunk cost.¹⁷¹ The post-Chicago school of thought therefore diverge from the Chicago school of thought that competition law is based on economics, and is rather based on assumptions on how market players operate.¹⁷²

With the Harvard and Chicago schools of thought as an analytical framework, it is time to focus the attention on the question of how the concept of *barriers to entry* has been interpreted in the EU legal order in an innovation market context.

¹⁶⁹ D. Chalmers et al, *European Union Law*, p. 911-913

¹⁷⁰ Michael S. Jacobs, 'An Essay on the Normative Foundations of Antitrust Economics', *North Carolina Law Review*, 74, 1995-1996, p. 225

¹⁷¹ *ibid*, p. 222-223

¹⁷² D. Chalmers et al, *European Union Law*, p. 915

5 Barriers to entry in innovation and R&D

5.1 Ex-ante analysis – horizontal cooperation agreements and horizontal mergers

Following below is a number of merger decisions assessed with relevance for barriers to entry theory in innovation markets. These cases are distinguished by the Commission's method of assessing a merger's impact on competition in innovation and R&D on relevant areas. These mergers have entailed plethoric aspects of competition law analysis, most of them outside the scope of this thesis. The interested reader is advised to consult the original merger decisions.

An essential part of the mergers analysed by the Commission has regarded merger control in the pharmaceutical industry. When assessing the development of new drugs and the possible future market entry in the pharmaceutical sector, the Commission has structured its analysis following the three phases in which the research is conducted.¹⁷³ The compound the research is conducted on is referred to as pipeline products. Depending on the phase the pipeline product is in, at the time of the merger, it has been conferred varying importance in the Commission's merger control. It is an important tool for analysing future competition in the pharmaceutical sector.

The *Bayer/Aventis* merger decision serves as a good starting point, as it in a clear and structured way elucidates the Commission's view towards innovation markets and barriers to entry. The merger regarded Bayer and their agricultural business acquiring Aventis agrochemical branch.¹⁷⁴ The proposed new entity raised concerns about the parties activity in a number of areas, inter alia crop protection products and animal health products.

¹⁷³ See Case No IV/M.737 – *Ciba-Geigy/Sandoz*, 1997, para 58. In the pharmaceutical industry, the development of new drugs can be distinguished into three phases of development. Phase I is the start of human clinical testing with some 8-12 years before the product can be marketed. At this stage only about 10 percent of the research projects stand a chance of being successful for launch onto the market. Phase II starts some 6-7 years before marketing launch. The rate of success is estimated to be 30 percent. Phase III is starting 3-4 years before market launch and the risk of failure is still roughly 50 percent. When the clinical testing is finished, a 1-2 years of registration process follows. After registration, 6-12 months of negotiating prices and decisions of reimbursement scheme from social security agencies is needed before the actual marketing of the drug can take place.

¹⁷⁴ Case COMP/M.2547 – *Bayer/Aventis Crop Science*, 2002

The Commission commenced its merger analysis by concluding the crop protection industry to be driven by R&D competition, involving only a few large companies engaging in developing new and more effective products. The industry was also found to comprise a number of generic producers, not conducting any R&D of their own. Competition in the agrochemical business was largely found to be dependent on R&D and innovation, not price.¹⁷⁵ Therefore, the Commission asserted it would consider and take into account the parties strength in R&D and its potential for future competition in current markets and future markets.¹⁷⁶

Regarding markets driven by R&D and innovation, the Commission stated that 'potential entry cannot be generally expected in the short to medium term, firstly because of the length of time required for development of equally effective substances, and, secondly, due to the costs involved in the development of a product capable of competing with the new or improved one. Market entry by means of innovative products is extremely difficult and resource intensive.'¹⁷⁷ Four factors were thus identified as important for innovation markets entry; time, cost, competence and resources. The Commission concluded that R&D projects in the agricultural industry can take ten years and the cost exceed 100 million Euros in total. Further, the right competency and adequate resources were needed for qualified tasks such as chemical synthesis, laboratory testing, process development, pilot production and field trials.¹⁷⁸

The Commission went on to assess pipeline products in the agricultural sector. The parties argued that R&D yield new products in quick succession.¹⁷⁹ But in the light of the low number of pipeline products in the agricultural sector and the fact that it took approximately ten years to launch a product onto the market, the Commission concluded the market not to be characterized by quick product successions.¹⁸⁰ Time was again submitted as an important factor to R&D competition.

¹⁷⁵ *ibid*, para 14

¹⁷⁶ *ibid*, para 19

¹⁷⁷ *ibid*, para 16

¹⁷⁸ *ibid*, para 16

¹⁷⁹ *ibid*, para 148

¹⁸⁰ *ibid*, para 149

The merging parties claimed generic products from other producers to form competitive constraints. Even though the main source of competition in the industry were non-price competition in innovation,¹⁸¹ Bayer and Aventis argued that since almost all of their active substances in the agricultural insecticides market were patented, generic producers had a competitive advantage as they were not forced to invest in costly R&D.¹⁸² An investigation showed that even if product patent expired, technical know-how for production purposes were often guarded by patents, with the effect that generic producers had to invest in R&D for the manufacturing processes.¹⁸³

Regarding the market for molluscicides, a product to combat snails, at the time of the merger no market entry had been made by generic producers even though two out of three of the active compounds on the market had been off-patent for a number of years.¹⁸⁴ The molluscicides market was considered to be extremely difficult and resource intensive to enter with a new active compound.¹⁸⁵ Generic competition did not form a competitive constraint on the merging parties since competence and resources for developing of new products and developing of manufacturing processes were crucial for market success. Consequently the lack of competence and the adequate resources formed barriers to entry for R&D market access.

Another part of the Commission decision regarded competition in the Small Animal Ectoparasiticides market,¹⁸⁶ relating to products used for control of fleas and ticks on small animals such as dogs and cats. Bayer marketed a product called 'Advantage'. Aventis did not market any product themselves, but were active in a joint venture with Merial and Merck where they marketed a product called 'Frontline'. The active ingredient in 'Frontline', 'Fipronil', was supplied by Aventis. 'Advantage' and 'Frontline' were market leaders. A number of generic products were also on the market, but did not constitute a competitive constraint on the incumbents. The market was driven by non-price R&D.¹⁸⁷ Again the Commission concluded market entry to be extremely difficult and resource-intensive. Costs of R&D and the timeframe for developing new products also constrained market entry.¹⁸⁸ No active innovative ingredient was expected to be launched for at least five years, nor were new competitors expected to enter the market, despite the two products very high market shares.¹⁸⁹

¹⁸¹ *ibid*, para 14

¹⁸² *ibid*, para 157

¹⁸³ *ibid*, para 160

¹⁸⁴ *ibid*, para 528, 537

¹⁸⁵ *ibid*, para 536

¹⁸⁶ *ibid*, para 1010

¹⁸⁷ *ibid*, para 1036

¹⁸⁸ *ibid*, para 1031

¹⁸⁹ *ibid* para 1033, 1028-1029

Four factors affecting entry were stated in the *Bayer/Aventis* merger decision to constitute barriers to entry; cost, time, competence and resources. Several more can be added to the list, for instance patents and legal barrier. These factors relate to the structure of the market and are recurrent in the Commission's merger control decisions.

In 2003 the Commission had to decide on the merger between DSM and Roche Vitamins.¹⁹⁰ DSM was predominantly active in the development and production of chemical and life science products, while Roche was mostly active in the production and sales of vitamins and carotenoids. The parties sought for DSM to acquire Roche Vitamins and hence taking full control of the company. In its competitive assessment, the Commission concluded that DSM and Roche Vitamins already had commitments with third party companies, involving NSP-degrading enzymes and phytase, used as additives in products for human consumption and animal feed.¹⁹¹ The merger raised questions regarding overlaps in these markets.

DSM had an agreement with BASF for the development, marketing, sales and distribution of enzyme products. DSM was responsible for production and R&D whereas BASF managed sales and distribution. The other merging party, Roche Vitamins, had an agreement with Novozymes for distribution of existing enzymes and development of new enzymes. The investigation concluded that both BASF and Novozymes were relying heavily on their agreements with DSM and Roche Vitamins respectively for their feed enzyme activities. The structure of both agreements accommodated for a high level of economic integration through profit sharing and research cooperation. The concentration of DSM and Roche Vitamins would create a structural link between the DSM/BASF alliance and the Roche Vitamins/Novozyme alliance. The concentration would place DSM in a position where it would be at the centre of both alliances and have the tool and the incentive to reduce innovation within its agreement with BASF.¹⁹² The two alliances, DSM/BASF and Roche Vitamins/Novozyme, were the main providers on the market for phytase. The only real competitor, AB Enzymes, only held a small part of the market. Apart from AB Enzymes, possible competition would have to come from new entrants.¹⁹³ Potential entrants were all found to be at least 2-5 years from being ready to launch a product on the market. The time factor acted as a barrier to entry. In some cases a possible product launch was dependent on the regulatory climate for approval of genetically modified plants. The uncertainty of the legal climate regarding genetic engineering acted as a barrier to entry for the phytase market.¹⁹⁴

¹⁹⁰ Case COMP/M.2972 – *DSM/Roche Vitamins*, 2003

¹⁹¹ *ibid*, para 51-77

¹⁹² *ibid*, para 66

¹⁹³ *ibid*, para 64

¹⁹⁴ *ibid*, para 64

In the merger between Ciba-Geigy and Sandoz, the parties sought to form the new entity Novartis.¹⁹⁵ In the area for health-care products, the merging parties had overlapping activities, which necessitated an investigation regarding the merger's impact on competition. The Commission regarded lengthy research and patents to characterize the market conditions for medicinal products in the pharmaceutical sector.¹⁹⁶ According to the parties themselves, the lengthy process involved and the heavy costs of developing a new drug constituted the main barriers to entry.¹⁹⁷

The Commission expanded its view on barriers to entry further down in the decision. Under a Future Markets heading regarding the merging companies strength in the area of HS-TK gene therapy, the Commission argued that the new entity might end up holding broad patent rights, which would exclude other undertakings from doing research in the HK-TS gene therapy field and concluded that the patents could constitute a barrier to entry to the research field of HK-TS gene therapy.¹⁹⁸ In the area of plant protection, where the parties activities also overlapped, the Commission stated that all the merging parties' competitors had the critical size needed for the accomplishment of relevant R&D, thus indicating that the size of R&D might serve as a factor affecting the barriers to entry in the innovation market.¹⁹⁹

In the proposed *Pharmacia/Pfizer* merger, the Commission investigated the market for erectile dysfunction drugs.²⁰⁰ The concerns regarded uncertainties in patent litigation for PDE-5 inhibitors against two competitors, the active ingredient in for example Viagra, that Pfizer was engaged in. Competitors to the merging parties were also active in the development of PDE-5 inhibitors, but Pfizer had already been awarded a patent for a broad method of use in the US. If Pfizer would win the patent litigation in Europe, it would refrain competitors to engage in developing drugs with the same active ingredient. It was thought that even if Pfizer would not win the patent processes regarding the same method of use in Europe, the US patent alone would discourage or delay research by the competitors because the market in Europe alone would be too small.

In 2007, the Commission received a notification regarding Schering-Plough's intention to acquire Organon BioSciences, who formed a part of Akzo Nobel.²⁰¹ According to the parties, the main driver for Schering-Plough's acquisition of Organon was to increase Schering's gap in pipeline products.²⁰² The proposed concentration had possible implications regarding human health products and animal health products, where both companies were active.

¹⁹⁵ Case No IV/M.737 – *Ciba-Geigy/Sandoz*, 1997

¹⁹⁶ *ibid.*, para 56

¹⁹⁷ *ibid.*, para 57

¹⁹⁸ *ibid.*, para 95-106

¹⁹⁹ *ibid.*, para 170-171

²⁰⁰ Case No. IV/M.2922 – *Pfizer/Pharmacia*, 2003, para 85-91

²⁰¹ Case COMP/M.4691 – *Schering-Plough/Organon Biosciences*, 2007

²⁰² *ibid.*, para 9

Overlaps in the animal health market created concerns for the competitive climate and accordingly barriers to entry were analysed with reference to new product markets.²⁰³ The R&D and development of new antigens for new vaccines and the expertise needed for such development constituted decisive factors for the length and the cost of the development program.²⁰⁴ In addition, the regulated structure of the animal health industry was also considered to create entry barriers for the development of new products. The regulatory work required for registration constituted another type of barrier for new product markets, as a new product were estimated by the parties to take five to ten years.

Pfizer and Wyeth merged in 2009 and the concentration was duly scrutinized by the Commission.²⁰⁵ In the competitive assessment regarding the animal health market the Commission provided a rather detailed comment on its view of barriers to entry. For the development of new products, the constraining factor were found to be R&D.²⁰⁶ Research in the animal health market were focused around developing active substances for pharmaceuticals and antigens for vaccines respectively. Due to market characteristics, the Commission found differences regarding entry barriers depending on whether the analysis related to pharmaceuticals or vaccines in the animal health market.

In the pharmaceuticals market for new products, barriers to entry consisted of lengthy research entailing high development costs paired with intellectual property rights.²⁰⁷ The development of new pharmaceuticals was found to span over three to ten years and the cost of research range from two and a half to ten million Euros.²⁰⁸

In the vaccines market, development costs of new vaccines ranged from four to thirty million Euros and the time span for development ranged from five to twenty years.²⁰⁹ Considerably higher than the pharmaceutical market. The R&D activities regarding vaccines aimed both at developing new vaccines and maintaining current vaccines, where the development of new vaccines were dependent on the expertise the undertakings were able to employ.²¹⁰

A distinction could also be made between an incumbent entering with a new vaccine and entry by a new player. Not only was it cheaper for incumbents to develop a new vaccine, but they also had an advantage over new market players with regard to regulatory barriers and production facilities.²¹¹

²⁰³ *ibid*, para 52

²⁰⁴ *ibid*, para 53-55

²⁰⁵ Case COMP/M.5476 – *Pfizer/Wyeth*, 2009

²⁰⁶ *ibid*, para 137-138

²⁰⁷ *ibid*, para 138

²⁰⁸ *ibid*, para 139

²⁰⁹ *ibid*, para 142

²¹⁰ *ibid*, para 143

²¹¹ *ibid*, para 144

For vaccines, a major constraining factor for new entrants regarded manufacturing facilities.²¹² Technology for the production of new vaccines were subject to patents, which made it difficult to enter a market with new and innovative vaccines due to lack of production capabilities. In the production of new pharmaceuticals, third party producers could be employed to handle the phase of actual production.²¹³

Even if the main entry barriers in the pharmaceuticals market and the vaccines market both consisted of development costs, peculiarities regarding the market structures could be found. Most notably, the difference between the pharmaceuticals market and the vaccines market regarded the production chain. Another important difference were the costs associated with development, as vaccines were considerably more expensive to develop.

In 2007, Owens Corning sought to acquire Saint Gobain's business in glass fibre reinforcements and composite fabrics. The set-up was analysed by the Commission under the ECMR.²¹⁴ The Commission had concerns over the effects on innovation regarding direct rovings.²¹⁵ Following a market investigation it was concluded that the two undertakings were considered to be the leading innovators in the industry for direct rovings. For example, both companies had developed new lighter and longer windmill blades. They both had high quality R&D departments, indicating that the concentration would in this matter constitute a competition problem. The Commission viewed the competence of the research departments to constitute a barrier to entry regarding the development of new products. The parties consented to divest certain assets, including a research centre with a team of twenty engineers, chemists and technicians. This divestment was held to safeguard the future of competition in innovation in certain product areas.²¹⁶

²¹² *ibid*, para 145-147

²¹³ *ibid*, para 141

²¹⁴ Case COMP/M.4828 – *Owens Corning/Saint Gobain Vetrotex*, 2007

²¹⁵ *ibid*, para 71

²¹⁶ *ibid*, paras 136, 144

In the *Glaxo Wellcome/SmithKline Beecham* merger in 2000, the Commission investigated the competitive situation regarding a number of product markets.²¹⁷ In the field of anti-virals, two generations of products existed on the market. The first generation consisted of 'Zovirax', and the second generation consisted of 'Famvir' and 'Valtrex'. The merging parties were the holders of 'Famvir' and 'Valtrex' respectively. Both parties enjoyed high market shares with their respective product. The Commission expressed concerns that the merger would increase barriers to entry for competitors who had pipeline products under development in the anti-viral area. The concern was that competitors would be discouraged to conduct R&D for the anti-virals market. The high market shares that would be enjoyed by the parties with 'Famvir' and 'Valtrex' if merging, would create barriers to entry to R&D for similar anti-viral products.²¹⁸

In the same merger, under a Future Markets heading, the Commission investigated the competitive situation regarding R&D in pharmaceuticals for the treatment of COPD²¹⁹.²²⁰ Both parties were found to have pipeline products but they were not overlapping. Pharmaceuticals for COPD were found to be an attractive area for R&D because of its large potential market and large unmet clinical need. Many companies were already conducting research on drugs for COPD. The attractiveness of the market combined with competitors already active in research in the COPD field seem to have been the decisive constraining factors and consequently the entry barriers were found to be low.²²¹

In the *Monsanto/Pharmacia&Upjohn* merger, the Commission underpinned the importance of R&D in the pharmaceutical industry and held that undertakings active on the pharmaceutical market competed by innovation.²²² Due to the fact that investments in R&D only could be financed through the cash flow generated by the company's products during their period protected by patents, it was seen as vital for pharmaceutical undertakings to introduce new products on the market.²²³ Only in the oncology field the two parties had overlapping R&D, and only to a minor extent.²²⁴ It was shown that a number of competitors were active in the R&D oncology field with pipeline products under development and accordingly the Commission could not identify any negative effects on the competitive situation regarding R&D in oncology.

²¹⁷ Case COMP/M.1846 – *Glaxo Wellcome/SmithKline Beecham*, 2000

²¹⁸ *ibid.*, para 95-97

²¹⁹ COPD standing for Chronic Obstructive Pulmonary Disease

²²⁰ Case COMP/M.1846 – *Glaxo Wellcome/SmithKline Beecham*, 2000, para 179-187

²²¹ *ibid.*, para 187-188

²²² Case No. IV/M.1835 – *Monsanto/Pharmacia&Upjohn*, 2000, para 92

²²³ *ibid.*, para 92

²²⁴ *ibid.*, para 93

5.2 Ex-post analysis – abuse of a dominant position

The ex-post analysis focuses on unilateral conduct, the possibility of an undertaking preventing and restricting innovation. The difficulty with this type of analysis is to separate an undertakings legitimate aim to outcompete its competitors, rather than to exclude competition. The ex-post analysis aims at investigating if and how barriers to entry is interpreted differently compared to the ex-ante analysis regarding concentrations and co-operations.

In 1988, the Commission found that Tetra Pak had abused its dominant position on the market for cartons for liquid food, which included the equipment and technology for filling these cartons.²²⁵ Tetra Pak had acquired Liquipak, which held an exclusive license for a new technology for sterilization needed for a new milk packaging process. This technology was licensed to Liquipak from BTG and represented a major potential development in the market. Liquipak had prior to the acquisition invested in the development of a new packaging machine with its exclusive distributor Elopak.

After Tetra Pak's take-over of Liquipak, Elopak was hesitant to continue the development started with Liquipak, since it would benefit Tetra Pak. The acquisition of the licence consequently discouraged Liquipak to develop milk packaging machines. The Commission found that Tetra Pak abused its dominant position on the relevant market through its acquisition of Liquipak, which allowed Tetra Pak to benefit exclusively from the technology licensed from BTG.²²⁶ The Commission held explicitly that the acquisition in itself constituted the abuse.²²⁷ This prevented, or at least substantially delayed Elopak from entering the market.²²⁸ At the same time, Tetra Pak strengthened its own position on the market, since the license represented one of few alternatives suitable for use with cartons for the sterilization techniques used by Tetra Pak. The Commission assessed the barriers to entry and found them to be in the production and maintenance of filling machines and more particularly such sterilization provided by the BTG licence.²²⁹ Accordingly, the Commission linked the abuse of a dominant position with Tetra Pak's acquisition of the licence and stated that Tetra Pak raised considerably or even insurmountable barriers to entry to the relevant market.²³⁰

²²⁵ Case No IV/31.043 *Tetra Pak I* (BTG licence), 1988

²²⁶ *ibid*, para 27

²²⁷ *ibid*, para 45-46

²²⁸ *ibid*, para 27, 60

²²⁹ *ibid*, para 23-25

²³⁰ *ibid*, para 44, 47

Tetra Pak appealed to the General Court, which upheld the Commission's findings by stating that the acquisition of exclusive licence through the takeover of Liquipak was an abuse of a dominant position which had the effect of preventing or at least considerably delaying entry.²³¹

In the high profile *Microsoft* case, the Commission concluded that the US software developer had abused its dominant position in two separate instances.²³²

The proceedings against Microsoft were launched after Sun Microsystems filed a complaint with the Commission, stating that Microsoft infringed TFEU Art 102 by reserving for itself information regarding certain software products needed for the interoperability between work group server operating systems and Microsoft's PC operating system.²³³ By refusing to share the information, Microsoft was able to extend its dominance from the PC operating systems market into the group server market. The second abuse regarded Microsoft's tying of Windows Media Player with its operating system Windows.²³⁴ By tying its media player, Microsoft foreclosed its competitors from the media player market.

The Commission concluded that the abusive conduct of not providing interoperability between their PC operating system Windows and competing work group server operating system had the effect of locking customers into a homogenous Windows solution at the group server operating systems market. This homogenisation of the server market, creating a de facto market standard, impaired the ability of customers to benefit from innovations brought to the market by Microsoft's competitors. Further, Microsoft's behaviour limited competitors ability to successfully market innovations and thereby had an discouraging effect to innovate.²³⁵

²³¹ *Tetra Pak Rausing SA v. Commission* (Tetra Pak I), Case T-51/89, [1990] ECR II-309, para 23

²³² Case COMP/C-3/37.792 – *Microsoft*, 2004

²³³ *ibid*, para 3

²³⁴ *ibid*, para 5

²³⁵ Case COMP/C-3/37.792 – *Microsoft*, 2004, para 694. Also, note the Council Directive 91/250/EEC on the legal protection of computer programs, OJ L 122 [1991], Art 6 which recognizes the importance of interoperability for the development of new software.

Investigation showed that in the past competitors had marketed their new products on the work group server operating system market by referring to their innovative features.²³⁶ In all, it was held that there was little scope for innovation in the group server operating systems market and accordingly Microsoft's refusal to supply certain information had a negative impact on the technical development of the market.²³⁷ The Commission found that Microsoft diminished their own incentive to innovate with the current situation, since the incentive to conduct R&D was spurred by their competitors ability to innovate.²³⁸ If the lock in-effect created by Microsoft's refusal to supply information were to disappear, their incentive to innovate in the work group server operating systems market would increase. The Commission found that Microsoft had incentives to lever its market power in the PC operating systems market into the market for work group server operating systems market because that market constituted a strategic entry barrier for undertakings wishing to enter the PC operating systems market, due to its interoperability with the former market.²³⁹ A method to enter into the work group server operating systems market would accordingly be to develop a new PC operation system.

The Commission concluded barriers to entry in the PC operating systems market to derive from network effects.²⁴⁰ Network effects is connected to the fact that using a PC operating system is closely linked to the use of different applications, often provided by independent software developers. From a consumer perspective the utilisation of an operating system is dependent on the number of applications available. Conversely, software developers will develop applications for the operating system most popular amongst users. The more popular an operating system is, the more applications will be developed to it and the more applications developed for an operating system, the more popular it will become amongst users.²⁴¹ Accordingly, applications writers will develop applications where they can reach the highest number of users. Microsoft referred this market characteristic as the 'positive feedback loop'.²⁴² This made entry into the PC operating systems market difficult.

²³⁶ Case COMP/C-3/37.792 – *Microsoft*, 2004, para 695

²³⁷ *ibid*, para 700-701

²³⁸ *ibid*, para 725

²³⁹ *ibid*, para 769 and 772

²⁴⁰ *ibid*, para 448

²⁴¹ *ibid*, para 449

²⁴² *ibid*, para 451

Further, the Commission regarded the development of a new operating system as 'extremely difficult', associated with high costs, time-consuming and connected with high risks.²⁴³ The sunk costs for the development of a new PC operating system was considered to be very high. Even more importantly, the Commission linked the risk of developing a new operating system with the effect created by the network effects. A critical mass of applications was needed to make a switch to a new system attractive for the consumers.

The dynamic between Windows and the large number of applications developed for the platform produced a self-reinforcing system and the developers of new applications had strong economic incentives to keep developing for the dominant Windows operating system. The Commission labelled the phenomenon as an 'applications barrier to entry',²⁴⁴ Microsoft's conduct not to provide information for interoperability with its Windows operating system was not only abusive but also had the effect of creating entry barriers with the purpose of strengthening the network effects.²⁴⁵

The Commission continued by analysing entry into the work group server operating systems markets. This market too, was beset by entry barriers.²⁴⁶ Also for the server market, entry barriers were composed of network effects. Compared to the PC operating systems market, the important notion was not the amount of applications but the availability and cost of support. The easier it was to find technicians skilled at using a work group server operating system, the more customers were inclined to acquire that system. The system also worked the other way, where a popular system attracted more skilled technicians. The network effects acted as a driver for cost and availability for system operation.

The second abuse where Microsoft was held liable was regarded its media player Windows Media Player (WMP). Media players were found to be a separate market from the PC operating system and the development of media players required large investments in R&D.²⁴⁷ By tying its media player to the Windows operating system, Microsoft foreclosed other media player developers from the market due to its dominant position.²⁴⁸ It was found that Microsoft distorted the competitive process in the media players market and that this distortion had a negative effect on innovation.

²⁴³ *ibid*, para 453

²⁴⁴ *ibid*, para 458-459

²⁴⁵ *ibid*, para 459-463

²⁴⁶ *ibid*, para 515-525

²⁴⁷ *ibid*, para 825 and 417

²⁴⁸ *ibid*, para 842f

Microsoft's tying had the effect of reducing the amount of talent and capital invested in the media player market. The Commission argued that the media player market had the potential of being a 'hotbed' for new and interesting products.²⁴⁹ The Commission also argued that the tying of WMP had a broader scope where Microsoft's behaviour sent signals to competitors which had a deteriorating overall effect on the willingness, both from a developers perspective and a venture capitalist perspective, to engage in innovation in technologies where Microsoft might take interest in.²⁵⁰ The Commission identified a situation where start-up enterprises before entering a new market had to analyse the risk of Microsoft bundling their own version of the product into Windows.

Barriers to entry in the media player market were characterized by the same network effects as the PC operating systems market. The network effects entailed low consumer demand in the event of the media player not being able to provide a significant amount of digital material that the player could play back.²⁵¹ Sunk costs, in the shape of creating new technologies and IPRs were alongside network effects considered to constitute barriers to entry.²⁵²

Microsoft appealed the Commission decision, but the General Court upheld the decision in all relevant areas.²⁵³ The Court reiterated the Commission's findings that the work group server operating systems market was beset by barriers to entry, composed of network effect and obstacles to interoperability.²⁵⁴ Also, the media player market was encompassed by network effects.²⁵⁵ The Commission was found to be correct that the bundling of the WMP to Windows operating system had the effect of distorting the normal competitive process, reducing the incentive to innovate and erecting content and applications barriers to entry in the media player market.²⁵⁶

²⁴⁹ *ibid*, para 980-981

²⁵⁰ *ibid*, para 983

²⁵¹ *ibid*, para 980 and 420

²⁵² *ibid*, para 417-419

²⁵³ *Microsoft Corp v. Commission of the European Communities*, Case T-201/04, [2007] ECR II-3601

²⁵⁴ *ibid*, para 558

²⁵⁵ *ibid*, para 1061-1062

²⁵⁶ *ibid*, para 1088-1089

6 Analysis

Barriers to entry is a potent tool for analysing competition in innovation and R&D, since market shares do not provide any guidance for this matter.

Through the case law regarding merger control, an ex-ante analysis, a broad stance has been taken towards what constitutes barriers to entry regarding innovation and R&D. The method used by the Commission catches a wide variety of factors that are alleged to deter entry. They often relate to factors such as costs, competence and resources connected to R&D. Entry barriers has also been found to relate to the time needed to conduct research, which in turn will affect the cost structure. In an innovation and R&D context, these barriers relate to sunk costs. In the *Pfizer/Wyeth* merger decision when comparing R&D for pharmaceuticals with R&D for vaccines, the Commission argued for a correlation between the size of the sunk cost and the ease of which entry can be made by potential competitors. This correlation is supported by the S-C-P paradigm and coincides with the levels of post entry profitability.

Patents and other legal barriers, such as regulatory provisions in the Member States have also been interpreted to constitute entry barriers. High market shares, even if not normally assessed in connection with R&D, were interpreted to constitute entry barriers in the *Glaxo Wellcome/SmithKline Beecham* merger.

Again in the *Glaxo Wellcome/SmithKline Beecham* merger, the Commission held that a strong and established brand in the pharmaceutical sector constrained generic products to enter the market. Even though this last example regarded an entry barrier to a product market, it shows how wide the barrier concept is employed.

In some situations, the Commission has also assessed what it considered to be sufficient competition. In both the *Monsanto/Pharmacia & Upjohn* merger and the *Glaxo Wellcome/SmithKline Beecham* merger, the Commission touched upon factors considered to lower entry barriers. Market attractiveness in the meaning of future profitability makes entry attractive and thus lowers entry barriers.

The broad scope of barriers to entry adopted by the Commission allows for an interventionist approach in line with the Harvard school of thought when assessing barriers to entry. This has encompassed an approach where the Commission prefers to include factors that might affect entry conditions, rather than to exclude them. This can be illustrated through the Commission approach in the *Pharmacia/Pfizer* merger, where the uncertainty regarding the future patent situation in Europe for PDE-5 inhibitors was interpreted in an unfavourable way for the parties. Also in the *DSM/Roche* merger, uncertainties regarding the legal climate for genetic engineering were held to deter entry.

All these factors seen as entry barriers in the above analysed merger decisions relate to the *market structure* with the aim to discover and avoid possible future dominance. Even though the stance taken of what constitutes barriers to entry is broad, it is an objective analysis of market conditions.

Turning to the ex-post analysis, the situation looks different. Barriers to entry has primarily been connected to the abusive *conduct* of the incumbent. This is clear both from the *Tetra Pak* and *Microsoft* judgments. This can be viewed in the light that dominance is not per se prohibited. By connecting barriers to entry with the abusive conduct, the definition of what constitutes barriers to entry becomes narrower compared to the ex-ante analysis, as it centers around the incumbent's ability to deter entry. Abuse is focused on harmful conduct that distorts the competitive process and consumer welfare.

In ex-ante analysis barriers to entry *constitutes* different factors, where in ex-post analysis barriers to entry is *created* by certain behaviour.

Accordingly, the application of barriers to entry theory regarding competition in innovation and R&D differs depending on employed ex-ante or ex-post. The ex-ante application of barriers to entry focuses on determining future dominance, while as the ex-post application of barriers to entry seem to be linked to abusive conduct. While dominance relates to the *structure* of the market, abuse relates to a certain *conduct* of an incumbent.

7 Conclusion

The current legal position, regarding barriers to entry theory for the purpose of appraising competition in innovation and R&D in the EU legal order, seems to relate to both *market structure* and *abusive conduct*. Accordingly, the employment of barriers to entry theory is twofold. This twofoldness in its employment entails an analytical tool that is difficult to master. For instance when reading the guidelines concerning the horizontal ex-ante perspective and comparing to the ex-post perspective regarding abusive exclusionary conduct, it is difficult to arrive at this conclusion.

At the same time, the differences found in the application of barriers to entry theory seem to coincide with the different objectives of ex-ante analysis and ex-post analysis, where horizontal concentrations and horizontal agreements is assessed with the purpose of preventing future dominance and where abuse of a dominant position is remedied due to the abusive conduct and not the actual dominance.

It is clear that the Commission has taken a broad stance towards what it considers to constitute barriers to entry. The interventionist approach the Commission has been criticized for applying is present also in its interpretation of barriers to entry. Such an interventionist approach might result in conferring market power to an undertaking that is already subject to sufficient competitive constraints. A too broad application of barriers to entry theory has effects on the competitive climate.

For example, in a TFEU Art 102 assessment regarding abuse of a dominant position, the lack of entry on the relevant market can be explained in two different ways. First it can be explained by claiming that the incumbent has abused its dominant position by raising entry barriers in order to protect its business. But the lack of entry might also be explained by the claim that the relevant market is already subject to sufficient competitive constraints and that it is due to the competitive climate rather than entry barriers that have deterred potential competitors from entering. Barriers to entry theory is employed to identify constraining factors on incumbents, not creating barriers thought up by the human mind. Such an approach as explained above clearly would have as its aim to protect the competitive process rather than cherish economic efficiency.

The Harvard school of thought has consequently had a decisive influence on how barriers to entry has been interpreted. The result of the Harvard approach adopted by the Commission towards barriers to entry analysis has the implications that very few factors escape being defined as entry barriers. This might create the effect of conferring market power on an incumbent in situations where it is not able to reduce the pace of innovation below competitive levels. The uncertainty this broad application entails is illustrated by the negative interpretation of uncertain factors the Commission conferred on the parties in the *Pharmacia/Pfizer* and the *DSM/Roche* mergers regarding patent litigation and the legal climate for genetic engineering respectively.

As discussed in this thesis, the concept of assessing competition in innovation and R&D has been debated from its very start and it is indeed difficult to measure due to the uncertainties surrounding the innovation markets concept. Parallel to the discussion on competition in innovation, barriers to entry is debated, not to its existence but to its extent. This is meritoriously elucidated by the different definitions provided by Bain and Stiegler, respectively. Combining competition in innovation and R&D together with barriers to entry theory is not a recipe for a clear and uncomplicated path of assessment. Therefore, a few remarks can be made in connection to the method of assessment created by the EU judiciary with the Commission in the driver's seat.

First of all, it has not been an easy task to analyse the two concepts. If difficult to understand separately, combined together it is even more difficult. It is not clearly spelled out by the EU judiciary what is meant by competition in innovation and R&D and how it relates to potential competition. Even if the Commission clearly defined innovation markets, innovation and R&D can also be assessed with regard to potential competition and even a product market. Further, the EU judiciary has also yet to set forth a clear enough definition of what constitutes barriers to entry for the use in competition law. The area is surrounded with uncertainties. The consequence is a system hard to assess for parties active on a market driven by innovation both in regard to mergers and co-operation as well as for an undertaking that wish to avoid being punished for abuse of a dominant position. Issues regarding legal certainty in such a process are ubiquitous.

Secondly, the impact of the approach currently employed might have an impact on firms' desire to innovate. The innovative market approach, originally employed to protect competition, might actually have an opposite effect when combined with an interventionist barriers to entry approach. Even if the main objective of the EU judiciary historically have been to protect the competitive process, the uncertainty regarding the outcome of the current employment of barriers to entry in innovation and R&D, would open up for an approach focused more around economic reasoning and the dynamic aspects of efficiency.

A positive note might be presented though. There seem to be a positive learning curve when looking at the Commission's Guidelines. For every new guideline, the Commission becomes better and better at stating their opinion and clarifying their view. Hopefully, this can offset some of the uncertainties now present in this investigated field of law.

In looking forward, what can be done to eliminate the aspects relating to legal uncertainty regarding barriers to entry when assessing competition in innovation and R&D?

By performing the analysis in an ex-ante and an ex-post perspective, the *lex ferenda* discussion opens up for some interesting thoughts.

The ex-post perspective leads to an approach where barriers to entry is attached to the incumbents' conduct, rather than market structure. Therefore, it is reasonable to approach the ex-post barriers to entry analysis in a Chicago manner. The post-Chicago school focuses on the market players behaviour. This seems to relate to the exclusionary conduct an abusive incumbent is trying to achieve. Inducing extra sunk costs that potential entrant must bear for successful market entry is what the EU judicature found to be the abuse in both the *Tetra Pak* case as well in the *Microsoft* case. This would entail narrow definition of barriers to entry in an ex-post perspective.

Also, in an ex-ante perspective, a narrower barriers to entry definition would be welcome. Aspects relating to economic efficiency would create fewer factors to be concluded as constituting barriers to entry. This would ease the amount of constraining factors placed on incumbents that wish to merge or co-operate in markets defined by innovation and R&D. With the innovation market approach already suffering from an unclear definition, a less interventionist approach would be preferred, creating much needed margins in the analysis process. Whether the definition should be as narrow as proposed by the Chicago school adherents is difficult to assess, but stepping away from the Harvard school interventionist approach might put some ease on firms' that wish to innovate more by merging or co-operating.

As shortly suggested above, there is scope for a twofold definition of barriers to entry, depending if employed ex-ante or ex-post. I have advocated an approach that would further narrow the definition of what constitutes barriers to entry. Such a standpoint moves towards a free market approach to competition law, making it at least to a certain extent a political issue. Whether the EU judicature is prepared to take such a step is uncertain. Regardless, a clearer definition of barriers to entry theory would in all circumstances be welcome.

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