Research and Development Cooperation in European Competition Law - A Legal and Economic Analysis

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- A Legal and Economic Analysis

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Abstract

Innovation is the number one single reason for welfare improvement and may well be the key to competition. As such it ought to move to the centre of antitrust analysis. My primary conclusion relates to the necessity of a policy of Methodological Relativism in antitrust policy leaving generalised results and truths concerning the competitive effects of different kinds of restraints to the distant past. Different markets show different inherent features, varying over time and place, implying different problems and varieties of problems at the analysis. In R&D-related horizontal agreements, an analytical framework is needed, that may promote dynamic efficiencies through innovation, even at the price of relatively smaller losses in static price competition, however without permitting the growth of a long-term market power strong enough to impede technological progress. In such a model the result should be determined after different inputs of for instance: the market structure (areas, actors, products, intellectual property rights, barriers to entry, saturation, potential competitors, regulations, market failures); the characteristics of, and intensity in, research and innovation in the markets; and ancillary restraints connected to the R&D-agreement. All these have effects on the markets of current products, innovation and future goods. In addition, problems of regulatory uncertainty must be addressed.

Contents

Introduction 5

Economic efficiency and market failures 7

The economics of joint R&D 10

Benefits of cooperation *12*

Harms of cooperation *14*

The trade-off *16*

Legislation and practices 19

Regulatory framework *19*

Art. 81(1) *21*

Art. 81(3) *25*

Group exemption 418/85 with amendments *29*

Legal and economic analysis 35

Regulatory framework *36*

Defining relevant markets *39*

Anticompetitive effects *45*

Efficiencies *49*

Trade-offs *50*

Concluding remarks 52

Introduction

As economic insights are developed, the political agenda shifts and new industry characteristics evolve - the discussion on appropriate public policies is given fuel, including calls for broadened debate on competition policy. Vertical restraints have been revisited, and many interesting facts were highlighted which have resulted in changes, commonly described as economically oriented, in the European policy. The Commission is currently undertaking a substantial review of rules and practices governing horizontal agreements, that is expected to result in a White Paper about future changes.

The central characteristic of horizontal restraints is actual or potential competitors joining together. As such, it "deprives the marketplace of the independent centres of decision-making that competition assumes and demand". For that reason it has been recognised that "such merging of resources may well lead to efficiencies that benefit consumers, but their anticompetitive potential is sufficient to warrant scrutiny even in the absence of incipient monopoly".[1] In addition to the effects of open cooperation it is necessary to take into account risks of collusion between the parties in other fields of business. A horizontal cooperation may remove rivals' uncertainty or diminish incentives to deviate from a coordinated strategy.[2]

Turning to the potential efficiency gains of horizontal restraints, these differ. The benefits may be scale and scope economies, network economies, transactional economies, information economies, which all should be recognised.[3] Production efficiencies are achieved from producing goods at lower cost or of enhanced quality using existing technology. However, innovation efficiencies – the cost saving or product enhancement gains from the innovation, development, or diffusion of new technology – are perceived to provide the greatest potential enhancement of social wealth.[4] R&D is a very costly activity and in avoiding duplication of research efforts, using complementary knowledge, experience and assets, sharing risks, and sharing results (dissemination), the expenses may be reduced, the innovative pace improved and product quality enhanced.

Horizontal restraints have traditionally been treated harshly. The initiated review may hopefully bring on a policy that is more economically oriented and up-dated.

There is a broad agreement that production efficiencies are recognisable under the EC law. Less well-recognised in present policies are dynamic efficiencies, such as improvements of product quality, product mix or service quality. These do indeed benefit consumers, but are harder to measure, thus making the trade-off difficult.[5] To develop methods for credible trade-off conduct is a delicate task, especially important for technological progressive industries driven by product and process innovation, where the application of a static equilibrium model may be harmful.[6]

Current economic developments in the markets should affect the review of horizontal restraints just as they did the review of vertical restraints. For vertical restraints, changed forms of distribution in combination with a fairly integrated European market made it possible to loosen some of the bridles. In the field of horizontal restraints, globalisation of markets, increased importance of dynamic high-tech and service industries and an increased importance of flexible contractual arrangements as an alternative to mergers, acquisitions and in-house production, ought to be important aspects to be considered in the review.

R&D is very important to the future welfare and competitiveness of Europe. Innovation is generally recognised as the number one reason for welfare improvement and Europe has lately been lagging behind Japan and US in the modern R&D intense industries. Innovation is the key to welfare and may very well be the key to competition within markets. The latter is important for antitrust execution; innovation may be the key to competition, not necessarily the other way around. There is thus much to indicate that innovation ought to move to the centre of antitrust analysis. To what extent is this happening? Are new tools and methods necessary?

This paper is mainly intended to stimulate discussion among parties interested in the development of competition policy. The European Commission is expected to deliver a White Paper on the treatment of horizontal restraints during spring 2000. I hope my contribution may facilitate the evaluation of the current situation and of coming proposals, by providing an analysis on a central field of horizontal restraints.

First I will shortly summarise the economic efficiency criteria and problems of market failures, underlying antitrust analysis. The major part of the economic presentation will then be devoted to R&D cooperation, which with its dynamic features is especially interesting but probably also especially demanding for lawyers, economists and politicians. The task is to

provide regulatory tools to identify agreements with negative net-effects for society while allowing cooperation where benefits prevail. The current legal treatment of R&D agreements will be presented through rules and practices. My following analysis combine legal and economic aspects in order to draw some tentative conclusions on the structure of accurate standards and the appropriateness of current legal treatment.

There are many important aspects of R&D, which call for coherent and focused public policy in fields outside the inner core of, but closely related to, antitrust. Intellectual property rights systems such as patents, trade marks and copyrights, tax policies and public subsidies are important features in completing the picture of R&D. These aspects, however fall outside the scope of this paper.

Sources on economic foundations antitrust and R&D are mainly books and articles by American and some European analysts, in most cases published in American economic journals, where the debate is most lively. Concerning European law and judicial treatment the commentaries are generally by European scholars.

Economic efficiency and market failures

Static (allocative) efficiency is the state, at a specific time and with a given production technology, when resources in society are utilised in an optimal way. In a market the joint surpluses of consumers and producers represent this societal maximisation. The market forces reach equilibrium, when the cost of producing the last unit equals the marginal willingness to pay for this unit, i.e. the intersection of the demand and the supply curves. At any other price and output, there would be a discrepancy between supply and demand, which in turn would have a negative effect on the joint surplus of producers and consumers.

There are however a number of assumptions that must be fulfilled for this equilibrium to hold.[7] Consumers must be perfectly informed about the products, prices etc. and act rationally using this information to maximise their preferences given their budget constraints. Also the producers must have perfect information and thus maximise their profits using perfect pro-

duction functions that rule out increasing returns if they were to change scale or technology. No individual, neither producer nor consumer, is strong enough to exercise market power, i.e. to influence price and output by his or her own behaviour – hence all actors on the market are price takers. Finally, no externalities exist.

In these assumptions lies the scope of Market Failures.[8] Suppose a producer is in a position to influence terms of trade on the market and therefore chooses to reduce the output and raise the price. Such behaviour is an exercise of Market Power, most typical for monopolised markets, markets with very dominant actors and in oligopolies with participants colluding in cartels. Another market failure, to some extent present in all markets, is Incomplete Information. Consumers are generally not perfectly informed about all relevant products, qualities and prices in order to compare and evaluate and then adequately act in accordance with their preferences. Producers are generally not perfectly informed about demand and production processes and may not distinguish between consumers with varying preferences. Consequently consumers do not maximise their utility and producers may produce inefficiently low or high outputs and qualities at misperceived prices. Externalities are actions of either producers or consumers, production or consumption, that have an indirect effect on another such activity but which are not reflected in the market price. These imposed benefits, or more often costs, are thus borne by others, making the producer choose an inefficient output and price. Finally, a Public Good is a good of which the consumption by a consumer does not exclude consumption by others. One example may be information, which once produced can be spread at almost no cost to a wide circle of consumers. Since the producers tend not to receive full compensation for this type of goods, markets undersupply, a problem sometimes solved through governmental action, either supplying the good or giving incentives for private production.

During the last few decades, the importance of dynamic efficiency has been increasingly highlighted in the industrial economy. Dynamism implies change. Continuous changes and improvements of products and production processes will enhance quality, lower costs and follow constantly changing consumer preferences, thus leading to a more efficient use of resources.

To motivate market participants to engage in such innovative activity, proper incentives must be given. With relation to this it is argued that large market shares and temporary market power may be the results of successful management and innovation, making the company the most efficient on the market. What would have been considered excessive or supracompetitive profits in the model of perfect competition, may instead be regarded as the reward of success, a pay-off important to provide sufficient incentives to take innovative risks in the first place. Furthermore, some indications show that concentrated markets may be necessary to obtain innovative leaps, since some industries involve such great risks that it is argued that large financial resources and the invulnerability of a large market share are necessary to handle them. On the other hand, a dynamic development also creates pressure on actors with market power, since they cannot afford to lag behind actual or potential competitors in the innovative and cost pressuring process. If not in the forefront in the evolution, the strong position will soon be lost. This implies that monitoring competition to sustain the actors' incentives is also necessary in the dynamic setting.

There is thus a confrontation and an interrelation between static and dynamic efficiency implying that a trade-off between the two variables must be made. To perform this analysis, features such as potential competition, uncertainty, entrepreneurship, innovation, barriers to entry and functioning capital markets are important.

The dynamic (innovation) efficiencies have been shown to carry great potential to increase social welfare, a potential often much greater than achieving static allocative efficiencies through the prevention of output limitations.[9] Short-term static inefficiencies are often outweighed by long term dynamic progress. If the market reduces GNP 10% below the competitive level but simultaneously allows growth at an annual rate of 3.5% rather than 2.5% the compound effects of the higher growth would cause the monopolised economy to surpass the competitive economy in under eleven years. Allocative efficiency losses at the considerably lower levels typically suggested by empirical studies are correspondingly less significant.[10] Studies have shown allocative inefficiency on markets generally to vary between 0.5 and 2 %.[11]Put in a real life example, the impact on social welfare becomes apparent. Between 1955 and 1970, the output (productivity) per labour hour in the US increased at an average of 2.54% per year. Between 1970 and 1985 the rate dropped to 1.17% per year. Had the

former rate of increased productivity continued and assuming the same number of labour hours to be employed, the GNP in the business sector would have been 22.7% higher in 1985 than it actually was. In money this corresponds to $771 billion.[12]

As seen, considerations of dynamic efficiency make the analysis more complicated than the static view and to decide which market structure best promotes efficient outcomes becomes very difficult. In addition, it follows that assessment of innovation efficiency requires a difficult comparison between actual and hypothetical events.[13] This makes the measurability of such efficiencies very difficult. The dichotomy between static and dynamic efficiency was early characterised by the legendary Judge Learned Hand as he recognised that the long-run interest of consumers may differ from their desire for "an immediate fall in prices."[14] A more recent summarisation concluded: "What is needed for rapid technical progress is a subtle blend of competition and monopoly, with more emphasis on the former than the latter, and with the role of monopolistic elements diminishing when rich technological opportunities exist."[15]

The Economics of joint R&D

In order to maximise welfare the goal is to achieve efficient research; to maximise return while minimising cost; to realise economies of scale and scope and synergetic effects while escaping those market failures which could lead to too little incentive to invest in R&D or behave efficiently.There are many reasons why the R&D level may be lower than is socially desirable.[16] Lack of exclusive appropriation of resulting benefits and spillovers to competitors may make R&D investments benefit society as a whole more than the investing firm. In addition, uncertainty is a prevalent factor in R&D, which is why risk attitudes are very important. Capital market imperfections coupled with asymmetric information may lead to risk aversion.[17] R&D may have to be treated by a coherent and sound public policy. If private costs can be kept down, complementary assets joined together, spillovers can be lowered and the effects of the appropriability problem can

be diminished by reducing public good effects and problems of asymmetric and incomplete information can be abated, all this by cooperation, then such conduct will be socially very desirable.

R&D joint ventures without restraints on product market typically both speed innovation and enhance product market competition if the primary R&D competition the venture candidates face is from others rather than from each other. But if the prospective joint venture parties have more to lose from falling behind each other, than falling behind the rest of the market, their collaboration may slow down the pace of innovation. If they possess market power in the relevant product markets before the anticipated innovation - the threat should be assessed both on pre-innovation and post-innovation product lines.

Research activity produces an input, knowledge, which combined with more tangible inputs such as labour, capital and raw materials produces final goods. In this respect it constitutes an upstream research market, as opposed to the downstream market for goods and services that are produced using the technologies developed by the research activity.[18] Within the research market, activities may involve basic research, refined research and product development. These sequential steps may be of importance to antitrust since the economic rationale both for society and for the individual actors differs along the scale. E.g. potential spillovers are greatest for basic research and decrease as we move to more applied development.[19]

For all investors the motive is the expected return. What makes the outcome of R&D activities distinct is its form – a piece of new information or knowledge. Once produced, that is discovered, there is no substantial cost in reproducing it. "The cost of finding new information is large but the cost of disseminating this information is relatively negligible; this constitutes an extreme form of scale economy."[20] As it is so costly to produce and so cheap to reproduce, it is also difficult to profit from, due to the features of public good inherent in knowledge production.[21] Since the investors are unable to appropriate all the gains from innovation, it follows that if the price they may charge is at a competitive level, as would be desirable from a social point of view, where price equals marginal cost, innovators will not be able to recover their costs. Hence there would be no incentive to engage in such activity.

Empirical research suggests that there is a substantial gap between private and social return, which could indicate that socially desirable investments are not considered worthwhile by private parties considering whether to undertake them.[22]

Benefits of Cooperation

The first benefit of cooperation is to create *Ex ante Incentives to Invest in R&D*.[23] Where one is dealing with intangibles such as ideas, information and knowledge, problems with assigning property rights are created. And even if intellectual property rights protect innovators, there will often be leaks due to employee mobility, reverse engineering and security failure etc, which may result in competitors' free riding, substantially reducing the returns to the innovating company. In addition, a large part of know-how is not possible or worthwhile assigning and enforcing property rights for, given current systems of intellectual property rights. Spillovers will strengthen the competitors and naturally negatively affect the incentives for research activity. Reverse engineering is cheaper than innovation, which may cause rational rivals to wait for innovating competitors on whom to free ride. Approximately 60% of successful innovations in the chemical, drug, electronics, and machinery business are imitated within four years at a cost of 65% of the producing original innovation.[24] If, however, competitors may jointly undertake such activity these fears may be reduced.

A second category of benefits is the realisation of *Economies of Joint Research*.[25] The presence of synergies, or complementaries in technology and technique among the parties, when each party has its own special skills and experiences, will potentially produce a cross-fertilisation of ideas. Especially when the parties are active in different industries or niches successful combination of selected productive assets is possible.

A joint venture will also make it possible to exploit economies of scale in R&D and avoid wasteful duplication of effort. When the minimum efficient scale of R&D is large, it makes little sense for each downstream firm to perform similar research upstream. Pooling of research may result in more resources poured into particular large-scale projects. It is not easy to identify or measure the benefits of avoiding duplication. Even if the

objective is similar, there may be a benefit in conducting various independent research programs since they are likely to follow different paths, which will yield various outcomes at different speed. On the other hand it might be better to have a joint team succeeding together than one single successful firm controlling all production, licensing etc.

Difficulties in price discrimination[26] make the inventor unable to appropriate the whole surplus e.g. from licensing, thus forcing him to sell at inefficiently low prices. Hence the innovative investments will not be at a socially optimal level. If innovation for future licensing is only conducted to a small extent, firms will have to duplicate R&D effort, which is much more expensive to society than distributing knowledge.

Another economy to be added is risk sharing. Research usually demands great expenditure up-front. The revenues are uncertain and if realised at all, they will occur at the end of a long process. However, risk sharing may be regarded as a secondary benefit, resulting from imperfections in the capital market since, in a smooth capital market, investors would be able to diversify anyway. Nonetheless, small and medium sized companies often have difficulties raising enough capital to enable them to pursue research activity on an individual level.

Finally a joint venture may facilitate market entry when barriers obstruct domestic or international markets, above all in highly concentrated markets or those protected by trade and investment barriers against foreign competition. It may in the latter case be possible to circumvent such impediments to trade by associating with domestic firms.

A third benefit of R&D cooperation is enhanced *Ex Post Dissemination*.[27] Knowledge has, as we have seen, features of a Public Good. When dealing with R&D results, economic efficiency demands a widespread dissemination. But in the long run such diffusion will only be beneficial as long as the producers can capture enough of the resulting benefits to make innovation worthwhile. It may be very hard to sell information as the value is difficult to assess before it has been transferred from the seller to the buyer, and if information has been "loaned" to the buyer for evaluation it is very hard to recover. Thus, there is scope for opportunism and asymmetric information to reduce incentives and lead to an insufficient dissemination of information. Cooperation may avoid such opportunism and asymmetric information since it is easier to measure R&D inputs than it is to

measure output before actually using the information. In this context a R&D joint venture might be seen as an ex ante licence agreement with a zero fee.

Finally, cooperation may realise *Transaction Cost Reductions*.[28] The joint venture is an alternative to integration within the firm on the one hand and a traditional market transaction on the other – a compromise between commitment and flexibility. In-house development or a full merger lead to rigid structures without easy mechanisms for switching research capability, strategy, partners etc. On the other hand, using the market may not allow for the long-term relationships that may be necessary in technology development. Frequent switching is both costly and inefficient and may further carry problems of moral hazard and adverse selection.[29] A cooperative research agreement may mediate these problems and provide for the optimal level of integration. Other problems might however appear: partner selection, defining well-balanced contributions, managerial problems, asymmetric gains and problems of confidentiality may create transaction costs of coordination and cooperation outweighing the benefits.

Harms of Cooperation

There is however also an incentive mechanism working in the opposite way. Cooperation may *reduce competition in the research market* (dynamic inefficiency).[30] If the costs of one firm are reduced or current products are improved, the profits of the other firms will fall. Hence, the effects of the resulting findings will constitute a negative pecuniary externality.[31] Consequently, there is a collective interest to lower the level of R&D conducted. If the parties are dominant in the relevant research sector the dynamic efficiency could be in danger. A joint venture could in these cases provide a way to collude and slow down the pace of innovation. In addition, in order to intimidate potential entrants, the parties may commit to excessive, wasteful research or building up excessive research structure. Such investments will signal a strong commitment and possibly deter market entry. There is an additional risk of X-inefficiencies if the parties together become so strong that they acquire great market power.[32] Monopolists may not have incentives to run their businesses in an efficient competitive way,

as they are not facing a monitoring competition. If they are able to charge supracompetitive prices and capture supracompetitive profits for current product and with current technology, the incentives to invest large amounts into new research in order to develop new goods may be diminished. Joint ventures also typically impose restraints on the participants' actions outside the venture, e.g. limiting the possibilities for the parents to compete with the venture.

If the number of independent research programs is reduced the resulting loss in diversity may have negative social effects. Duplication is not uniquely wasteful since slightly different objectives and paths of research will produce different results and may speed up discoveries.

Finally, problems of trust between the competitors forming a joint venture may prevent a well-functioning cooperation and transfer of technology between the parents, thus slowing down the process.

Secondly, a cooperation *may reduce competition in product markets* (present and future static inefficiency).[33] The possibility of a cooperation growing to include other fields of activity is apparent. The venture then serves as conduits for coordinating market behaviour, exchanging competitively sensitive information, in markets outside the field of the venture, and possibly on markets where such conduct would not be permissible under antitrust rules. Such adverse spillover effects are facilitated when the collaborating firms are vertically integrated. Naturally, the risk is most acute when the market is concentrated and barriers to entry are substantial. It is thus not the research joint venture itself but the restraints added to it that may cause static anticompetitive effects. These restraints may be express terms of ancillary nature in the joint venture agreement or may arise as more or less unspoken collusion between the parties during the cooperation. Ancillary restraints typically may include joint production and distribution, division of downstream markets, per-unit fees to the venture, mechanisms for side-payments and other measures for redistributing cartel revenues. Furthermore, when several firms jointly control important patents or other know-how, they may be reluctant to licence non-members. Fewer independent entities may lead to increased prices and limited use of technology.

Many of these anticompetitive effects may already appear on current product markets, since market power over current technology may be protected and cemented. If the parties control current patents, they will benefit from coordination. Such restrictions on existing patents could be built

into an agreement on future development e.g. through cross-licensing.[34] The concerns however apply a fortiori to the future product markets of the jointly innovated goods.

The Trade-off

In order to balance pros and cons, a model must be chosen, indicating what benefits and costs should be weighed against each other.[35]

O.E. Williamson's trade-off model for mergers is widely recognised. In maximising the surplus of both producers and consumers he showed that a relatively modest gain in economies of 5 percent or less would be sufficient to offset a price increase of 10 or 20 percent. This model ignores where the benefits occur, and concerns only the total maximisation of producer and consumer welfare.

An alternative to using total surplus is consumer surplus standard to ensure that wealth is not transferred from consumers to producers. This would thus require a showing of much greater magnitude of efficiencies than would the total surplus standard.

A third possibility would be to regard the total welfare, thus including potential effects on other markets than the one relevant in the specific case.

From an economic point of view the third model seem to be the most appropriate one, however very hard to apply in real life. The model commonly used in practice instead seems to encompass the two first welfare standards. All efficiencies and anticompetitive effects to the producers and consumers in the specific case are taken into account but usually some significant pass-on to consumers is required.[36]

When assessing and evaluating the competitive advantages and disadvantages connected with a certain agreement *in the research market*, the analysis must assess the state of the world in absence of the proposed cooperation. Hence the trade-off will have different results depending on the variety and extent of such comparable research. If no similar research will be conducted absent the agreement, antitrust ought to be lenient and permissive. Even when such agreements include ancillary restraints, the net effect is likely to be positive, especially taking into account that several restrictions may be efficiency promoting themselves e.g. in preventing opportunism.[37]

Once there are further alternative research sources the efficiency gains become less obvious. If there is one comparable program the efficiencies must come from economies of joint research or dissemination. Joining different parties with different knowledge and experiences may create valuable synergies. There will in the one-alternative-program case be no duplication savings or efficiencies in overcoming problems of appropriability. However since the returns to the individual firm participating in a joint program will be less than that of a single successful firm, there might be a danger of a slow down in the innovative pace.[38]

When, in absence of the proposed venture, several other research patterns will be conducted, a primary benefit of a cooperation could be to avoid duplication.[39] Such benefits should not be underestimated. If the degree of overlapping in research between the parties is high, the cost savings are likely to be substantial. Yet the venture might be a means of reducing the R&D effort, especially since there likely would be a race between the researching teams absent the venture. However, these concerns are limited by the fact that if either party estimates it has more to gain from the likelihood of winning the innovative race than from synergetic effects and reduced duplication, the venture is unlikely to occur.

Turning to effects in *product markets*, all cooperation in research would be positive to the product market if the product markets are heterogeneous, as the parties are not competitors on this market. The more homogenous the greater are the anticompetitive risks. However, if the cooperation concerns only a small proportion of market participants they will not be able to restrict the others.[40]

The analysis of a joint venture differs from the analysis of a merger in its extension to examine the possibilities of adverse spillovers between the parents in markets outside the actual field of the venture.

In the assessment it is vital to take into account the specifics of the industry in which the analysed joint venture is active. All merger control and control of horizontal restraints focus the analysis on whether the transaction will create, enhance, or facilitate the exercise of market power. If the risks of such exercise are not apparent and plausible, the conduct should be permitted. Many R&D intense branches in which joint ventures are created are characterised by a *dynamic competitiveness*.

Keeping technological elbows sharp has become a crucial question for both big and small companies. Consumers will disregard out-dated products and innovation will thus force the participants to improve their products and production processes. With innovative production processes, firms will be able to cut costs and thus lower prices. Even the temporary monopolist must ensure that he has the latest products and processes, probably the major reason why monopolists very rarely live very long.

The increasingly important high-technology industries naturally also constitute the most intriguing markets for R&D analysis. These research intense industries display the complexity and ambiguity inherent in fast, progressive and developing markets. There are thus many reasons for special antitrust interest in these markets, sometimes both diminishing old antitrust concerns and raising new ones.[41] The speed of technological change leads to short product life cycles which may, because of the relatively short period of time in the sun for a dominant actor, diminish antitrust concerns or at least call for new criteria of assessing dominance. In a continuous restructuring of the markets, previously separated operations are becoming integrated and previously integrated are becoming separated, developments that often take unexpected turns. On the other hand it means important first mover advantages, which in turn may create a need for interim antitrust measures, due to the relative slowness in the antitrust machinery.

The answer to the question whether innovation should be promoted with a view to the maintenance of fierce competition is not as self-evident as one might expect. Authorities point to some evidence of innovation being better encouraged and carried out in competitive industries, even if they admit that cause and effect may be reversed. (Innovation spurring competition.) However, the evidence is inconclusive and as individual markets vary greatly it is impossible to draw any precise conclusions on the relationship between market structure and innovation. “In a realistic sense, the pace of technology is so great that even a 17 year patent life may not be realized, and it is very difficult to see how any company in the world market could ever monopolize any market...”[42]

Already Joseph Schumpeter believed that market structure determines the rate of innovation. He did not, however, believe that more competition would lead to more innovation, on the contrary, that to engage in extensive innovation investments, the conditions of a monopolist were the most appropriate.[43] On the other hand Kenneth Arrow concludes that greater

competition leads to greater innovation because of the greater incentive given to the actors due to higher profits and the possibility to keep abreast accorded to the one who innovates successfully.[44] To date no one has been proven right, the evidence is inconclusive and markets vary greatly, hence no unambiguous general theory has emerged.[45]

Legislation and Practices

Regulatory framework

In its first paragraph, Art 81 of the EC Treaty prohibits all agreements between undertakings, decisions by associations and concerted practices, which may affect trade between Member States and have as their object or effect the prevention, restriction or distortion of competition within the Common Market. The form or means adopted by the undertakings is of lesser importance, the issue is whether the action will restrict competition.[46] Agreements contrary to Art 81(1) are void according to Art 81(2); case law has established that this nullity only affects the aspects of the joint venture that are violative of Art 81(1).

Since the scope of the first article is such that it will also cover a large number of agreements and practices with socially beneficial effects, 81(3) offers the possibility of exemption from its effects when the conduct in question contributes to the improvement of production or distribution of goods or to the promotion of technical or economic progress.

All venturers must analyse a planned joint venture to find out whether it is consistent with EC Competition Law. If there is any doubt they must notify the venture to the Commission and request an exemption, a negative clearance or an informal comfort letter.[47]

Because of the inherent vagueness of Art 81 as to its borders and possible interpretations, necessary methodologies for the executing authorities have been developed through cases, guiding notices, policy reports etc, providing some predictability for the concerned parties regarding the vast

variety of agreements potentially falling under the scope of the article. The authorities in their decisions and cases usually do not offer a very detailed exposition of the considerations and economic reasoning behind the outcomes. An analysis of the current judicial treatment will therefore have to depart from regulations, notices and reports where such views are summarised.

Within the scope of joint ventures the different features connected to various kinds of ventures necessitate divergent actions from the authorities. The broader the substantive and temporal framework of the cooperation, the more strongly it will influence the business policy of the parents in relation to each other and to third parties. Consequently, the Commission has recognised both in single decisions, the Block exemption, reports and notices, a difference in attitude towards pure R&D joint ventures on the one hand, and the spectrum of increasingly market oriented ventures ending in joint sales on the other hand.[48] This has been called a Hierarchy of Acceptability.[49] If R&D collaboration is limited to the stage prior to industrial application, it may fall completely outside Art 81(1) while more extended ventures will be treated more harshly and will generally have to be exempted pursuant to Art 81(3) if they are to be legal. Such exemptions should be based on an analysis of the overall economic balance of the specific arrangement and call for an economically realistic approach in the assessment of any particular case.[50] Even though the treatment by the authorities towards pure R&D agreements is permissive, we must keep in mind that these agreements are rather rare. Usually the venturers wish to extend the collaboration to post-innovative stages. The Commission has also recognised that some kind of joint application of the results is a natural part of R&D activity.[51] This may be part of a tendency to a more permissive view of R&D joint ventures including exploitation. Still, coverage of the whole spectrum of different agreements and how these are treated is necessary in order to evaluate the current position of R&D.

Any analysis of conformity will start with Art 81(1) in order to decide whether the features give rise to anticompetitive effects in the first place, and if so, the analysis is extended to include the possibility of exemption under Art 81(3), whether by individual decision or via the Block exemption.

Art 81(1)

Any appraisal of a joint venture aims to establish whether the agreement will prevent, restrict, or distort competition between parents but also whether the joint venture is likely appreciably to affect the competitive position of third parties, especially with regard to supply and sales possibilities, i.e. foreclosing others from markets, outlets or sources.[52] In addition, the analysis will include the possibility of spillovers or the existence of network effects having material effect on competition.[53] There are thus a number of issues to address in deciding whether restrictions of competition pursuant to Art 81(1) are likely.[54]

The competition between the parents-dimension is a concern in cases where the parties are actual or potential competitors. The assumption of potential competitive circumstances presupposes that each parent alone is in a position to fulfil the tasks assigned to the joint venture and that it does not forfeit its capabilities to do so by the creation of the joint venture - i.e. restrictive effects may occur between the parents if, absent the venture, they were likely to engage in the activity independently. [55] The likelihood of such independent R&D has been expressed as a function of the degree of activity that the parents have in the same or adjacent markets.[56]The Commission developed in its Thirteenth Report on Competition Policy, a number of elements for clarifying this relationship and more specifically the possibilities for the parents to perform tasks individually instead of together.[57]

- *Contribution to the joint venture*
  Does each parent company have sufficient financial resources to carry out the planned investment, sufficient managerial qualifications to run the joint venture, access to the necessary input products?
- *Production of the joint venture*
  Does each parent know the production technique, make the upstream or downstream products himself and have access to the necessary production facilities?
- *Sales by the joint venture*
  Is actual or potential demand such as to enable each parent company to manufacture the product on its own? Does each parent company have

access to the distribution channels needed to sell the product manufactured by the joint venture?

- *Risk factors*
  Can each parent company on its own bear the technical and financial risks associated with the production operations of the joint venture?
- *Access to the relevant market*
  What is the relevant geographic and product market? What are the barriers to entry into that market? Is each parent company capable of entering that market on its own? Can each parent overcome existing barriers within a reasonable time and without undue effort or cost?

The Commission has taken a broad view in finding that parents are potential competitors. Volkswagen and MAN were considered potential competitors in the market for intermediate weight lorries since they both were active in other markets of commercial vehicles.[58] In other cases sufficient financial and technical resources or the necessary technology to develop competing products made the parties potential competitors.[59] Even if the parties would not be able to maintain a production level high enough to be efficient, and thus were not very likely to commence such activity, according to the Commission they could recoup their development costs in other ways, such as sub-licensing or manufacturing for third parties.[60] In addition, the Commission has found that parties possessing resources and expertise to extend their product lines to include the joint venture products were potential competitors, even though evidence showed that, but for the joint venture one party would have withdrawn from the market and the product probably would not have been developed.[61]

However in Elopak/Metal Box-Odin[62], "neither party could in the short term enter the market alone, as such entry would require a know-how of the other party's technology which could not be developed without significant and time-consuming investment", hence they were not considered competitors.

Even if joint ventures between non-competitors in principle do not fall within Art 81(1), it can still apply to agreements between non-competitors if it nonetheless entails the likelihood of restriction or distortion of competition. Examples could occur where parties jointly develop intermediate products for application in different products on different markets. These

agreements may simultaneously foreclose third parties competitive opportunities, create risks of spillover or network effects.[63]

Where the parties are considered competitors the analysis turns to the restrictions likely to follow from the arrangement. The non-independent exploitation of research results constitutes competitive restrictions according to Art 81(1) where the venture includes application of the results and parties accept expressly or by implication. These restrictions may for example consist in committing to joint production or marketing, inability to grant licences to third parties and agreements to pay royalties where these are not justified by reference to unequal contribution to the venture. In principle the parties must be able to use the results of the joint work after the termination in accordance with the principle of equal access to the results.[64] Indeed, the Commission has conditioned an exemption on the parties having equal access to the results even when the contribution to the joint venture has been very unequal.[65] Cross royalties have been regarded as creating disincentives to compete with the other party.[66]

Another possible effect to take into account is the existence of "spillovers". When parties are collaborating in one field, this cooperation may facilitate joint conducts and reduced competition also in other fields of operation. The risk is particularly high when the parties remain active in the same market as the joint venture, or are competitors in upstream or downstream markets to the joint venture's market. It must not necessarily involve active collusion but may be due to a passive lessening of the competitive tension between the parties.[67] Spillovers are especially important to the analysis of R&D cooperations. Collaboration in one field must not lead to a wide-range technical collaboration nor must the joint R&D lead to a diminished level of downstream competition with respect to production and sales.[68]

The more the markets are overlapping, the greater are the opportunities and the stronger the inducements for market sharing.[69] Parties have been forced to abandon downstream activities to be exempted, due to such spillover risks.[70]

The *competition between the parent companies and the joint venture*[71] of course largely depends on the structure of the agreement. The formation of the venture may be sufficient for the Commission to conclude the non-existence of competition between the parents and the venture.[72] Potential risks

occur when the joint venture is active in up- or down-stream or adjacent markets to the parents. The more extensive the venture functions are, the more significant appears the risk of detrimental effects of influences or collusive behaviour between the parents and the venture. Such anticompetitive behaviour is typically manifested in the division of geographical markets, product markets or customers. In such cases the participating undertakings reduce their activity to the role of potential competitors. If they remain active competitors, they will usually be tempted to reduce the intensity of competition by coordinating their business policy, especially as to prices and volume of production or sales, or by voluntarily restraining their efforts.

Regading *effects of the joint venture on the position of third parties*[73], again the structural relationship and scope of the joint venture will be determinant for the ability of the parties to affect their environment. If the parents dominate the relevant market and leave it to the joint venture to handle their purchases or sales, the choice available to suppliers or customers may be seriously restricted. Such foreclosing effects for third parties may be further enforced by the grant of exclusive intellectual property licences to the joint venture by the parents. Combined resources of the parties may give competitive advantages in foreclosing competitors[74] and so can economies of scale in combination with restrictive sub-licensing.[75] The Commission even recognises the possibility of third parties being "psychologically" deterred from competing with a joint venture of dominant firms.[76]

When the potential effects have been identified, the question arises how to quantify them, in order to *assess the appreciable effect on restrictions of competition*. The Commission regards the following factors as the most important:[77]

- the market shares of the parent companies and the joint venture, the structure of the relevant market and the degree of concentration in the sector concerned,
- the economic and financial strength of the parent companies, and any commercial or technical edge which they may have in comparison to their competitors,
- the market proximity of the activities carried out by the joint venture,
- whether the fields of activity of the parent companies and the joint venture are identical or interdependent,

- the scale and significance of the joint ventures' activities in relation to those of its parents,
- the extent to which the arrangements between the firms concerned are restrictive,
- the extent to which market access by third parties is restricted.

The analysis will look at the relative market shares of the participants. If these are small the impact on competition may not be significant. In the notion of potential competition, the barriers to entry are of central importance. The Commission have here gone a few steps further than have their colleagues in the U.S., when including plants and commercial networks as advantages of incumbent firms, although new firms could acquire them simply by making the same expenditures.[78]

Clearly, if a joint venture in itself may act as a forum of collusive and restrictive behaviour, *networks of joint ventures* will magnify the antitrust concern.[79] As in the assessment of the single joint venture, the analysis will have to include the manner in which the network joint ventures and parents may affect each other and third parties. If parents set up several joint ventures active in the same product market but in different geographical markets, such a development in particular ultimately could endanger the goal of the single European market.

Art 81(3)

In order not to prevent agreements which are overall socially beneficial, on the ground that they may restrict competition in the relevant market, paragraph three provides a possibility of individual exemption for agreements, decisions and concerted practices that contribute to improving the production or distribution of goods or to promoting technical or economic progress, while allowing consumers a fair share of the resulting benefit. A decisive factor is usually whether the contractual restriction on the parties' economic freedom is directly connected with the creation of the joint venture.[80] The arrangement must neither impose on the undertakings concerned restrictions which are not indispensable to the attainment of the

economic benefits, nor afford such undertakings the possibility of eliminating competition in respect of a substantial part of the products in question.[81]

Ideally, competition must be fully functioning at all times, which is why a substantial elimination of competition may never be accepted, however great the efficiencies may be. In the WANO case[82] the venture was prohibited without questions of contribution of goods or the promotion of technical progress being considered since "the implementation of the agreements would afford the parties the possibility of eliminating competition in respect of a substantial part of the products in question in that the implementation of the agreements would result in the insulation of the United Kingdom market by precluding sales into the United Kingdom by suppliers other than WANO..."

The acceptance pursuant to Art 81(3) of restrictions on the parents or the joint venture depends above all on the type and aims of the cooperation. Agreements that have as their main purpose the coordination of actual or potential competition between the participating undertakings will be given a negative assessment. This will apply particularly to features such as price fixing, output reduction and quotas on sales, market divisions and contractual restrictions on investments.[83]

The analysis will weigh the potential benefits and the potential negative effects on competition. These benefits are judged objectively and the burden of proving that the conditions of the paragraph are satisfied lies primarily upon the parties. Moreover, the Commission observes competition as the best supply of contract terms. Accordingly, it is generally incumbent upon the parties to show that the agreement confers positive benefits beyond those to be expected on the free market.[84] In the actual weighing procedure, the economic balance, the type and the extent of the respective advantages and risks can be assessed. If the parents are economically and financially powerful and have a high market-share, or will enforce an already existing concentration, their application for exemption will need a rigorous examination.[85]

Recognised economic benefits are, for example, improvements in competitive structure – e.g. through facilitating entry by joining together or if one party otherwise would have abandoned the market. Joint actions open up new markets, expand sales in new territories or enlarge the supply range by new products. All these are contributions to dynamic competition, con-

solidating the internal market and strengthening the competitiveness of the relevant economic sector. Furthermore, cooperation may enable the parties to penetrate markets more speedily and efficiently. On the other hand, the rationalisation of production activities and distribution networks is seen rather as a means of adapting supply to a shrinking or stagnant demand. It leads however to cost savings which, under effective competition, are usually passed on to customers as lower prices. Plans to reduce production capacity, however, lead mostly to price rises. Only if they serve to overcome a structural crisis, to accelerate the removal of unprofitable production capacity from the market and thereby to reestablish competition in the medium term will such agreements be judged favourable.[86]

It is important that the parties are able to continue their business after the joint venture expires. In KEWA it was considered that the agreement "enables the parties rapidly to reach a position where they can reprocess on an industrial scale, while at the same time allowing them to retain interest in a new industry where conditions do not favour isolated efforts by individual firms; the parties are to continue joint research and development into the application on an industrial scale and in profitable conditions of the technical experience they have acquired in building and operating a pilot plant."[87] The more technologically advanced the specific products are, the more permissive seems the antitrust treatment. Cooperation that facilitates or speeds up the introduction of important new technology will usually be treated leniently.[88]

Even if the parties are big companies, when the joint venture is formed in order to combine complementary expertise and resources to overcome the substantial technical difficulties and financial risks associated with developing advanced new products, they will be treated favourably. And so will also the creation of new industry capacity, for example, the construction and operation of new production facilities and enlargement of existing facilities, if the parties can demonstrate that the joint activities will avoid the construction of excess capacity and result in economies of scale, thereby permitting the parties to reduce unit costs and achieve greater profitability.[89] The creation of joint ventures for sales, usually with the object and effect of coordinating the sales policy of competing manufacturers, closing off price competition and restricting volumes, belongs to the category of classic horizontal cartels. Joint distribution of the contract products is viewed

positively, however, where it is part of a global cooperation project which merits favourable treatment pursuant to Art 81(3) and for the success of which it is indispensable.[90]

Some cases are exempted after being amended to reduce the significance of the non-R&D elements. In Asahi/St. Gobain, exemption was granted, by analogy with Regulation 418/85, after the agreement on joint exploitation was amended to expire five years after commercial production commenced.[91]

There is an important distinction between restrictions of competition which arise from the creation and operation of a joint venture, and additional agreements which would, on their own, also constitute restrictions of competition.[92] Such additional agreements, ancillary restraints, may be directly related to and necessary for the establishment and operation of the joint venture and cannot be dissociated from it without jeopardising its existence. In these cases they are assessed together with the joint venture. But if they are of subordinated importance and simply concluded at the same time as the joint venture creation without having those features, they are treated separately under the usual rules of competition. When assessing the "necessity" of the restriction, account is taken of the nature and the duration, subject-matter and geographical field of application in relation to the joint venture.[93] If a joint venture does not fall within the scope of Art 81(1), neither do ancillary restraints connected to the venture. Conversely, if a joint venture falls within the scope of Art 81(1), then so will any ancillary restrictions. Examples constituting such necessary restrictions are exclusive know-how licences from the parties to the venture and non-exclusive grantbacks to the parties covering improvements to be used outside the field in which the joint venture is active.[94] Another example is the obligation not to sub-license any jointly developed technical information without the consent of the other parent companies and an equal share of the licensing fees obtained.[95]

If the joint venture is a full-function undertaking[96], the relationship of joint venture arrangement now requires a separate legal assessment.[97] Recently this kind of ventures has been transferred for consideration under the Merger Regulation.[98] According to Art 3(2) of the Regulation "The creation of a joint venture performing on a lasting basis all the functions of an autonomous entity shall constitute a concentration within the meaning of paragraph 1(b)."

Group exemption 418/85 with amendments[99]

Through this regulation the Commission has granted a block exemption pursuant to Art 81(3) to certain R&D agreements between undertakings. The scope of the regulation however also includes agreements covering joint exploitation, since such exploitation is considered to be a natural consequence of joint R&D.[100] As the Regulation is an important part of the Commission's policy towards R&D, it is thought to embody the different aspects of such policy. This means that the basic concepts of the Regulation will effectively define the basis used in the grant of individual exemptions in cases falling outside its scope.[101] The Regulation ultimately seeks to maintain workable competition and to ensure that the technical progress from the R&D does not merely serve to produce monopoly profits.[102]

Through the use of an opposition procedure, agreements that meet the basic conditions of the regulation and do not contain blacklisted provisions are automatically exempted if the Commission has not opposed within six months after the agreement being notified.[103]

Art 1(2) provides definitions for key notions of the Regulation. Worth noticing is that included in the term R&D is "the acquisition of technical knowledge and the carrying out of theoretical analysis, systematic study of experimentation, including experimental production, technical testing of products or processes, the establishment of the necessary facilities and the obtaining of intellectual property rights for the results". Also services are included in what is denoted as contract products. Exploitation of contract products means the manufacture of the contract products or the application of the contract processes, the assignment or licensing of intellectual property rights or the communication of know-how required for such manufacture or application. It should be noted that this definition does not include selling the products or mutual selling-licences.

The choice of legal form for the cooperation is not important to the application of the Regulation. Art 1(3) consequently defines R&D or exploitation to be carried out jointly when:

a) the work involved is:
   - carried out by a joint team, organization or undertaking, jointly entrusted to a third party, or

- allocated between the parties by way of specialization in research, development or production;

b) the parties collaborate in any way in the assignment of the licensing of intellectual property rights or the communication of know-how to third parties.

Where the work is jointly entrusted to a third party, the latter is probably not a party to the joint venture. Consequently, this agreement is not exempted according to the Regulation, but if necessary examined under the general principles of Art 81 and, more specifically, in accordance with the notice on subcontracting.[104]

For the exemption to be applicable there are certain conditions in Art 2 to be met. First of all, the joint R&D must be carried out "within the framework of a programme defining the objectives of the work and the field in which it is to be carried out." It is rather easy to imagine the Commission being concerned that loosely defined horizontal arrangements could evolve from R&D to contain other fields of cooperation. Furthermore, any of the participants could otherwise simply slow down the pace of R&D since it knows it will have access to the results of its competitors and will have to share its own result with the others.[105]

In order to realise many of the advantages of cooperation, such as avoiding duplication and increasing dissemination, all parties must have access to the results of the work. Where the agreement provides only for joint R&D, each party is free to exploit the results of the R&D and any pre-existing knowledge necessary therefor independently. This is important as it may, in the absence of joint exploitation, allow each party to license the others' background technology, as much as necessary to exploit the results independently.[106] It is also in accordance with the above-mentioned definition of exploitation in Art 1(2).[107]

In addition, "the joint exploitation relates only to results which are protected by intellectual property rights or constitute know-how which substantially contributes to technical or economic progress and that the results are decisive for the manufacture of the contract products or the application of the contract processes."[108] By such a demand, the scope of the exemption is narrowed to agreements where R&D is both the main objective and substantially contributes to technical or economic progress.[109]

It is however not always easy, sometimes impossible, to determine whether the condition is met (or more correctly, *will* be met), ex ante when the agreement is negotiated.

Last, in order to ensure that each party is able to obtain the contract products and thus to compete in supply, "undertakings charged with manufacture by way of specialization in production are required to fulfil orders for supplies from all the parties".[110]

Market Share Limitations – Art 3. With a view to maintaining competition, as required by Art 81(3) and in accordance with indications in Recitals 8 - 10, Art 3 limits the scope of agreements to those typically incapable of eliminating competition. In order to guarantee the possibility of several independent poles of research and thus to maintain the diversity of R&D, the contracting parties' combined production of the products capable of being improved or replaced by the contract products must not exceed 20 % in the Common Market or a substantial part thereof.[111] Further, if the distribution of the products is carried out by one of the parties, a joint venture or a commonly designated third party the limit is reduced to 10 %.[112] If these market shares are exceeded the parties will have to seek individual exemption, in case their agreement infringes 81(1).[113]

These limitations apply in cases where, and to the extent that, the parties are competing manufacturers, since here reduction in R&D competition can be expected. Hence, the competitive situation of the downstream market is used as an indication for competitive concerns at the innovation stage. As a consequence, if the product which the R&D relates to is completely new or is basic, the condition does not apply.[114] However, cooperation on key-patents, which in their extreme could monopolise the market, may according to some commentators require individual exemption pursuant to Art 81(3).[115] Such treatment seems in line with the statement in Art 10 d, which provides an opportunity for the Commission to withdraw the benefit of the Regulation in cases where the contract products are not subject to effective competition.

Duration limits - Art 3. Where the parties are not competing manufacturers of the products within the scope of the cooperation or if they are competing manufacturers with a market share below 20 %, the exemption shall apply for the duration of the R&D programme and, where the results

are jointly exploited, for five years from the time the contract products are first put on the market within the Common Market.[116]

According to the wording, pure R&D could be exempted infinitely. But since Recital 8 states that the Commission's concern is to ensure independent poles of R&D, it is not clear that a successful R&D cooperation, making the parents dominant on the market, can continue indefinitely.[117]

After the R&D project time or alternatively the five year period, the exemption shall continue as long as the production of the contract products together with the parties' combined production of other products which are considered by users to be equivalent in view of their characteristics, price and intended use, does not exceed 20% of the total market for such products.[118] At this stage it is the market of the contract product that is relevant, not the replaced or improved products. If the contract products are components in other products, it is the market share of the final products that counts.

The White List – Art 4, lists some terms of agreement that may have restrictive effects on competition and thus generally would fall under Art 81(1) but are considered inherently beneficial to society within the framework of the R&D concept.[119]

The article opens by clearing obligations not to carry out independently R&D in the field of, or in a field closely connected to the joint programme, during the execution of the venture.[120] In addition, parties may accept not to enter into similar R&D agreements with third parties.[121] If the parties could not limit the other parties' research in the field and thus may be unable to rely on the others' commitment to the joint programme, many of the positive economic aspects of cooperative R&D could be lost. These are the only white listed obligations relating to R&D, the following restraints cleared relate to the exploitation of the results. Agreements to purchase the contract products exclusively from a joint manufacture are exempted as are agreements not to manufacture contract products or apply contract processes in territories reserved for other parties.[122] Even though such territorial restrictions may have significant impact on competition, they are considered more easily acceptable than sales restriction. We should however keep in mind that for joint terms of exploitation the requirements in Art 2 about the significance of technical or economic progress must be met.

Exempted also are restrictions on the manufacturing of the contract products to one or more fields of application if the parties are not actual competitors as in Art 3.[123] Furthermore, territorial restrictions of active selling, marketing, establishing branches, maintaining distribution depots in other participants' territories, are exempted for a period of five years from commercial launch provided that users in the relevant area can obtain the products from other sources and the parties do not restrict parallel imports.[124] In addition, the parties may agree to grant one of the parties, a joint undertaking or third undertaking the exclusive right to distribute the contract products provided that this undertaking does not manufacture or distribute products which compete with the contract products.[125] If such right is given exclusively to joint undertakings or third undertakings, in the whole or a defined area of the Common Market, it is a provision that the users and intermediaries are also able to obtain the contract products from other suppliers and the exclusivity of the undertaking does not render it difficult for users and intermediaries to obtain the contract products.[126] As mentioned before, these distribution exemptions only apply when the parties' production of the products does not exceed 10 % of the market for all such products in the Common Market or a substantial part thereof.[127]

Finally, the last exempted provisions are mutual obligations to communicate experience or improvements to each other and to grant non-exclusive licences with respect to improvements and new applications.[128]

Art 5 provides us with a list of *Just in Case exemptions* - clauses that typically would fall outside the application of Art 81(1), and thus not have to be exempted but are none the less mentioned in the regulation to provide certainty to the parties and serve as guidance.[129]

Permitted is the inclusion of provisions to communicate technological knowledge required to carry out the research programme or to exploit its results.[130] The use of this kind of knowledge may be limited to the scope of the joint programme.[131] Obligations to maintain intellectual property rights and to take action against infringers are also allowed, and so is the obligation to maintain the confidentiality of know-how after the termination of the joint venture.[132]

If the parties have contributed unequally to the joint venture or have exploited the results unequally, such differences may be balanced by an obligation to pay royalties or to render services to the other parties.[133] If a

party receives royalties from third parties these may be shared with the other parties.[134] Finally, parties may be obligated to supply minimum quantities of contract products and to observe minimum standards of quality.[135]

The Black list - Art 6. The Commission has also defined a list of clauses that may not appear in joint venture agreements if they are to be exempted according to the regulation. Consequently, if a blacklisted clause appears in an agreement, not only will the exemption not apply to that clause, it will not apply to the joint venture itself.[136] These terms generally seek to protect the freedom of the parties to continue their independent business activity, thus to behave as active market participants. This list closely circumscribes the restrictions exempted in Art 4.[137]

The founders of the joint venture may not be restricted in their freedom to engage in R&D in separate fields of activity or, after the time of its completion, in the same field as the joint programme.[138] Further, parties may not be restricted within the Common Market from challenging the validity of intellectual property rights brought in by the parties to the joint venture after the completion of the R&D programme. Nor may the right to challenge property rights protecting the results of the R&D be limited after the completion of the cooperation (including joint exploitation).[139] There is thus some scope for situations where no-challenge clauses may be e contrario permitted, probably in order to make feasible contracts that allow the parties to trust each other's future conduct.[140]

Restrictions relating to manufacturing or selling quantities and each party's freedom to determine the prices of its sales of the contract products are also prohibited.[141] The parties may not be restricted as to the customers they serve, except so far as it is required by field of use restriction.[142] Hindrance of active sale activities in territories within the Common Market reserved for other parties is forbidden after the initial five-year period. Forbidden from the start is for a party to be required to refuse "without any objectively justified reason" to meet orders from sources within their respective territories that wish to market the products in other territories within the Common Market.

Finally, the parties may not be prohibited from granting manufacturing licences to third parties even though the exploitation of the results is not provided or does not take place by the parties.[143]

Termination of Exemption – Article 7. The Commission may withdraw the benefits of the regulation if it finds a particular case exempted by the Regulation nevertheless has effects which are incompatible with the conditions in Art 81(3), in particular where the agreement has substantial foreclosing effects to third parties in R&D or access of contract products or when the parties without any objectively valid reason do not exploit the results of the joint R&D. Benefits may similarly be withdrawn when in the whole or a substantial part of the market there is a lack of effective competition to the contract products.

Legal and Economic Analysis

To assess and evaluate the practical economic outcome of the European rules and practices in a single case is to a large extent infeasible. The reason is partly the legalistic manner in which European Competition policy is executed. The rules, especially Art 81, are used as working manuals and followed in the traditional legal methodology, where the fulfilment of the prerequisite leads to a prescribed legal consequence. The problem is that the fulfilment of the single prerequisite calls for an economic analysis, and the ultimate consequence depends on the relative weight resulting from these analyses. Even though the authorities theoretically recognise the necessity of basing their approach on economics, the character of judgements and decisions has remained legally dogmatic. The prerequisites are presented and the different factors effecting the fulfilment are demonstrated and commented on, but not explicitly assessed. Since the economic analyses possibly conducted are not explicitly demonstrated, it is very hard to evaluate their appropriateness.[144] The analysis to be conducted here will therefore not depart from single decisions and cases, but from the regulations and practices as a whole.

My analysis will start with the regulatory framework, continue by discussing markets, market power, negative and positive effects and end by examining trade-off questions. Each section ends with a limited conclusion about its specific field.

Regulatory Framework

Per se prohibitions, Rules of Reason, and Intermediates. Due to the lack of preciseness in economic theory about the general relationship between the level of R&D and competition and about the relationship between R&D and innovation, a case by case or at least industry by industry approach seems inevitable.[145] When adding the differences in features between different markets and situations, clearly a per se approach or a presumptive rule will not suffice. To develop legal definitions of conducts and structural characteristics, which by their mere appearance result in a certain legal treatment, will not provide an economically well-founded policy. On the other hand, an open-ended rule of reason approach may not be satisfactory either. An unstructured rule of reason could lead to unfocused, protracted litigation that places the party with the burden of proof at a severe disadvantage. An alternative would be intermediate rules using a limited set of variables.[146]

Among the legal commentators there appears to be an agreement that a rule of reason like the American model does not exist in Europe. This is in turn commonly believed to result in the wide scope attributed to the prohibition in Art 81(1) and in the lack of emphasis on the competitive impact of contracts concerned.[147] In addition, the number of cases requiring exemption causes great administrative problems for the authorities and distortions for the parties. The solution has been the issuing of group exemptions to mitigate the authorities' workload.

As realised in the recent overhaul of the legislation covering vertical restraints, the specific, detailed monitoring of business conduct as controlled by several narrow group exemptions is not a genuinely productive one. First, the care exercised by the Commission in granting general exemptions makes the really interesting cases fall outside its scope anyway. Secondly, the provisions are formal by their nature, in a way not optimal to cope with economic borderline questions. The resulting rules are very hard to interpret and do not provide sufficient legal certainty to the parties, and in order to provide that certainty the opposition procedure may have to be used, involving substantial work for the authorities.[148]

For the cases of real importance to antitrust, an individual exemption has to be requested. To obtain such an exemption is very time consuming and costly to the parties. On average the parties must wait eighteen months

before the Commission makes its decision.[149] In the De Laval/Stork case it took six years, a rather long time perspective in an R&D environment.[150] Confidential information must be communicated and unwanted publicity may occur. Furthermore, when the authorities examine an agreement, changes in the cooperation is often a pre-condition for the grant of exemption, which may or will alter the bargaining power between the parties concerned.[151] A carefully negotiated contract, often very complex, where costs, benefits and risks are allocated between the parties according to their ability and power, risks being twisted to the benefit of one party and a corresponding disadvantage to the other party. This risk may intimidate enterprises from entering into agreements that will require approval by the Commission.

The group exemptions thus tend to shape practices on the markets since, as noted, parties seek to avoid individual exemption and since they also serve as a model of interpretation in individual exemption cases. If the group exemptions are not economically updated, they will undoubtedly act as strait jackets to the European Markets.

The Commission claims that it cannot undertake a full-size economic analysis in every case,[152] which of course is true if every economic transaction with potential economic detrimental effects on cross-border trade is to be examined. If group exemptions are to have any effect on the number of applications for clearance they must impose limits in market shares under which antitrust concerns are not recognised, thus working as an extension to the de minimis-rules. Alternatively they must make use of standardised terms of agreements, contract situations and contract partners to identify settings which are assumed to work in different economic ways. Such conduct would be contrary to all relatively new theories of antitrust economics and industrial organisation, especially when handling horizontal arrangements.

A far more efficient solution, reducing both the workload of the Community Authorities and detrimental interference in the markets, would be to focus the attention of the Authorities on cases of actual or potential creation of such strong domination that a real-life risk of opportunistic behaviour is present. These are rarely the cases notified to the Commission for exemption.

It is considered difficult or even impossible to precisely evaluate efficiencies which might offset the anticompetitive effects of an agreement

since that implies estimates of demand elasticities, magnitudes and probabilities of cost savings, the welfare and consumer losses from increased market power and the expected rate of diffusion and time lag from innovation.[153] Many commentators point to the inability of the enforcers actually to balance efficiencies against anticompetitive effects why such a trade-off should not be made unless it is absolutely necessary. The authorities, it is said, lack information to make such estimates reliable, particularly ex ante the transaction.[154] In addition, the parties often have the burden of establishing the existence and magnitude of the efficiencies, as they have better access to the relevant facts for the efficiency claim.[155]

In order to let the market actors choose the forms of organisation and business solutions they perceive to be the most efficient, emphasise ex post-monitoring and to focus the resource allocation within the Competition authorities, a system of elaborated Guidelines ought to be considered. The parties would then have to rely on the accuracy of their own antitrust analysis, if later contested by antitrust authorities. Like other legal issues connected to the agreement, the antitrust concerns will largely be the responsibility of the lawyer consulted.

Conclusion: What seems to be required is thus a modified rule of reason. A possible solution without mandatory notification, would be elaborated Guidelines describing the relevant analysis.

For R&D agreements, currently accepted practices should be expressly safe also in the future. As the anticompetitive terms grow, the parties to an agreement will have to show caution as regards the overall effects. Entry barriers, intellectual property rights, market saturation etc will be ingredients in the analysis. Permission for an agreement will hence not primarily be dependent on a close legal interpretation of the contract terms. Such a system would save antitrust resources for the, in reality relatively few, hard-core borderline cases where both potential benefits and anticompetitive dangers are imminent, demanding a full-blown economic analysis. In addition, it will allow the possibility of assessing the efficiencies ex post, whereby cooperations where predicted efficiencies have failed to appear, or where collusion has substantially extended the anticompetitive concerns, may also be identified. Moreover, it would satisfy the demand for methodological relativism.

Defining relevant markets

Market limitations. Traditionally under European Competition Law the relevant market has been determined by two main parameters: products and geographical area. According to the practice of the Commission and the Court, a product market would comprise the totality of products that, with respect to their characteristics were particularly suitable for satisfying constant need and only to a limited extent interchangeable with other products. The geographic market was defined as an area, sufficiently homogenous and limited by realistic economic alternatives available to buyers and sellers, where a dominant firm might be able to engage in abuses.[156] The inherent vagueness in this method caused great uncertainty regarding the market definition and consequently regarding the firms' market shares. The practice was even considered to be deteriorating into something of an "ad hoc gerrymandering to reach a predetermined outcome".[157]

The Notice on market definition[158] has launched the same method of defining relevant markets as is used by the US authorities. The range of products and the area in which the parties' market shares are to be assessed is determined by the consumers' reaction to a hypothetical small (5-10%) permanent relative price increase by a hypothetical monopolist of the products and in the area where the parties are acting. If the consumers would switch to other products or areas to such extent that the price increase would be unprofitable, additional substitutes and areas are included in the relevant market. The procedure will continue until the products and the area, which the hypothetical monopolist controls, is wide enough to make the price increase profitable. This is an improvement, requested by many, which probably will reduce the arbitrary characteristics of the analysis in the past.

There will however remain difficulties in defining relevant product markets and assessing market shares for presumptive joint venture parties. Especially when products are heterogeneous or the parties cooperating are active in several fields it will be difficult to ascertain whether a specific percentage is exceeded.

To make solid definitions of relevant market for future new products will always be a very delicate matter. In addition, market delineation for R&D is more uncertain than defining product markets, since it must be

evaluated on the basis of qualitative evidence of their likely future significance.[159] When the results of research are easy to communicate the determined R&D market ought to be worldwide.

Applicable Markets. US antitrust methodology recognises innovation as a product of its own. Based on the 1992 Horizontal Merger Guidelines the innovation market concept, later set out in the 1995 Intellectual Property Guidelines, has through the National Cooperative Research and Production Act[160] been extended to incorporate also cooperative arrangements short of full mergers, such as joint ventures. According to the American approach, market power in product markets is defined by a measurement whether the firm may raise the price of a good without causing a significant number of customers to buy other goods instead. Similarly, market power in the innovation market is defined as a firm that may lower its R&D spending without causing other firms correspondingly to increase their R&D investments. In other words, one looks to see whether a hypothetical monopolist may benefit from retarding the pace or limit the scope of R&D directed toward the envisaged product.[161] Other factors, such as unique research capabilities of the relevant firms and how the transaction may improve innovation efficiencies, are also taken into account before determining market power in an innovation market.[162] According to the Guidelines, innovation markets are only to be used when it is not possible to use relevant markets for the specific goods concerned, e.g. in cases of development of brand new goods that do not yet exist. They are to be delineated only when the capabilities to engage in the relevant R&D can be associated with specialised assets or characteristics of specific firms. When defined, innovation markets will include "all firms with the capability and incentive to undertake research and development closely substitutable for" that at issue, "even if they are not competitors in relevant markets for related goods".[163]

In Europe however, the approach does not include defining innovation as a specific market. Instead it recognises possible future developments as part of the goods or service market it is analysing.[164] The Commission considers, when there is specific evidence of competing lines of R&D, whether a merger or transaction is likely substantially to restrict competition in R&D.[165]

However the divergence in methodology perhaps does not result in great differences in practice, as the FTC's[166] underlying concern is also the effect on a goods market. FTC's aim is likewise to analyse the changes in ability or incentive to engage in innovation competition after the transaction.

The practice of the Commission is to grant more importance to competition in R&D only in cases where competition between the firms in question is driving research in the field and is directed specifically towards producing or improving the same product or process.[167] Future product market analysis is however hard to apply in practice as it often is impossible to compute a market share for new products due to the problems with establishing the correct market definition and assessing the likely future success. Moreover, even when the market shares are ascertainable, legal limits will often be exceeded by the parties since the innovative nature of new products means that they have some initial advantage over any potential competitors.[168]

Another tendency when analysing competition in R&D as a means of assessing competition in future product market as compared to defining and analysing a specific innovation market seems to be that the Commission is not so focused on having independent research enterprises in every field.[169] The Commission usually accepts a great dominance in research if the downstream competition in product application is guaranteed in some way or another e.g. through extensive licensing, free exploitation by all parties etc. It seems hard to draw any general conclusion which approach delivers the most appropriate results. The European view could enable the parties to realise great economies of cooperation, above all in basic research. If the product market is competitive, research could be left free for the parties to achieve in what they reckon to be the most efficient manner.

There are some arguments for the distinction between the upstream research market and the downstream product market. As the characteristics of the different markets vary greatly, e.g. barriers to entry and hence the nature of actual and potential competition, it has been argued that it is essential to assess the conditions of competition in each market separately, even if the actor is vertically integrated, i.e. active in both up- and downstream markets.[170] However, the analysis must include the interaction between the different markets as well, a fact that makes the analysis of re-

search cooperation especially demanding. Another basic point is that historical market shares in a market characterised by rapid innovation may not be a good indicator for future market power. Existing market shares may shift rapidly among competitors as products are developed or improved and new entry may render high market shares insignificant in a relatively short period of time.[171] However the question remains whether the Authorities should and are able to use an innovation market methodology. The question seems to divide legal and economic commentators.

Gilbert and Sunshine have suggested a market for innovation calling for a five-step methodology:[172]

- Identify overlapping R&D activities. Probably, not all R&D spending concerns the specific product. The competing R&D is what will allow the relevant firms to make the same product. Distinguish the use of same specific R&D assets.
- Identify alternative sources of R&D, potential competitors.
- Evaluate the competition from downstream products that other firms are already selling. Such competition will presumably put R&D pressure on a monopolist to invest.
- Assess the increase in concentration in R&D resulting from the venture.
- Assess R&D efficiencies.

Landman starts his argument against innovation markets with the fact that competition does not necessarily lead to innovation. Studies show no clear correlation and in some cases a high degree of competition leads to lower profit rates in combination with a greater risk of losses due to copying competitors etc, and will instead abate the flow of R&D investments. Secondly, R&D does not necessarily lead to innovation, and the Authorities are unable to identify whether firms invest wisely or not and hence cannot tell whether a specific R&D effort will hurt or help the economy. Landman's conclusion is that the Authorities should act to ensure that a firm does not monopolise a market that does not yet exist, but probably will exist. This will keep the competition but let the firms decide on R&D. Moreover, he concludes that the US authorities, even if they say they should find and regulate innovation markets, actually do nothing but identify and protect

future product market. In doing so they act consistently with many of their critics' comment.[173]

Also Hay and Rapp, according to whom traditional tools (particularly potential competition doctrine) are adequate, oppose the innovation market approach. The innovation market approach is at best superfluous and simply another arrow in the agencies' quiver to stop mergers on other grounds. At worst, it takes the focus off the real issue or takes a leap into the unknown.[174] Focusing on the R&D aspect may be misleading because, even though it is accepted that concentrated industries may carry higher prices, predictions about the effect of higher concentration on R&D effort or on innovative success are far more controversial.[175] It should however be remembered that Hay and Rapp are commenting on innovation market approach in merger cases, and therefore their opinions on the application to joint ventures are unknown. A focus on future product markets seems more justified when a permanent and complete integration is created.

One should also be careful about drawing conclusions about the probable effects of today's agreements in the next-generation markets by reference to R&D spending and expertise. When, in an antitrust assessment focusing on competition in R&D itself and asking whether today's agreements allow the companies to slow down competition in a whole area of innovation or R&D, there is a danger of allowing high R&D spending and innovative skill today to become a large disadvantage for the company. Of course, large and successful R&D spending and skills do carry some limited disadvantages in the competition perspective. But it would be irrational to penalise an activity as not being inherently desirable when it is crucially necessary in the sectors in question.[176] Another reason not to focus primarily on R&D is that it is the Early Leaders, coming after the pioneers, who do best in new markets. It could therefore be unwise to base forecasts on future markets on pioneers' R&D.[177]

If the American authorities fails to define and use an innovation market approach may the reason may originate in too much of the product market methodology is transferred onto innovation markets, and for that reason the specific features of the latter are not allowed full impact. Hay objects the method of associating given market share thresholds with a high likelihood of reduced competition and higher prices for a given product, to be carried over to an analysis of market shares of R&D inputs in an innovation market.[178]

There are some arguments supporting a sound innovation market approach:

First, there could actually exist a genuine market for innovation, where innovation is bought and sold, being the final good. Secondly, if an innovation market is defined, the barriers to entry and other particular market features on this specific market may be identified, affecting the acceptability of the venture, rather than barriers to entry on present and future product markets. Thirdly, there seems to be at least as much uncertainty in assessing future market shares as defining innovation markets when the former must include an assessment of the likelihood of successful research. R&D outputs are very hard to estimate.

In sum, if an innovation market is to be defined, part of the analysis will have to focus on this specific question. A pitfall of the Commission's approach is to let present market shares influence too much of the analysis of the future. In my view, an innovation market analysis could safeguard dynamic efficiency in analysing a R&D cooperation. This analysis should focus on preventing long-term market power abuse by maintaining possibilities of potential competition in the innovation market. Consequently, it is not the task of the Authorities to regulate the R&D in detail or requiring in a manner the presence of several active independent lines of research.[179] The ultimate impact of the innovation market analysis in the overall analysis should depend on the degree and nature of product market restrictions in the agreement as a whole.

It should be kept in mind that the American approach does not ignore the product markets (both current and future) but these are analysed separately and later the interrelations are analysed. The use of an innovation market does not mean that the analysis does not have to extend to future downstream markets – the concern of future market power does include other features apart from the R&D advantage. Provisions should cover the exploitation of the results, the characteristics of relevant financial strength (to buy innovation) and distribution infrastructure (to exploit bought innovation quickly).

Conclusion: The new method of defining the extension of markets will reduce the arbitrary feature formerly experienced. It will in addition highlight the central concern of competition law - the possibility of exploiting market power. In order to obtain an analysis focused on the possibility of slowing down the pace of innovation, to recognise specific features differ-

ing between innovation and product markets and to remove the focus from, solely, a speculative assessment of future market shares, an economically coherent policy would call for an analysis which focuses on the effects on dynamic efficiencies, safeguarding continuous innovation. To analyse specific R&D cooperation, a developed innovation market approach could be a way of creating such policy.

Anticompetitive Effects

Exploitation of Market Power. If he becomes too dominant, a market participant may be able to influence the prevailing terms of contract on the market. Traditionally the exploitation of such market power will consist in lowering output and raising prices, in order to capture some of the consumers' benefits of trade. In the R&D setting the main interest of the consumers is merely the rapid replacement or improvement of current products and the establishment of brand new products. Market power on current product markets is also relevant in this respect since it is likely to influence negatively the incentive to undertake such development or replacement of current products. However the mere exploitation of market power would consist in lowering output (pace) and raising price for the developed technology.

The Commission consequently holds that competition and diversity in R&D must be maintained since an excessive concentration of R&D effort could reduce the number and range of new products and processes coming onto the market in future years. Joint R&D also tends to give rise to a general alignment of policies among the participants both as regards the subject matter of the R&D (i.e. the new products) but also in other fields (in particular existing competing products). Agreements extending to joint exploitation of the technology, whether by joint licensing or joint production, give the participants the opportunity of jointly controlling output of the product and are thus only appropriate for exemption where the participants do not enjoy market power.[180]

Market Power, Market Shares and Potential Competition. In the view of the Commission, in the absence of market power, many restrictions should generally be treated permissively. However, the view alters if market power

exists, where no general presumption of legality can be made. "Therefore, it makes economic sense to use market-share thresholds to limit the application of a block-exemption regulation."[181] This is partly true as low market shares make market power impossible, since the impact of a single small firm on the terms of trade on the market will be negligible. High market shares, on the other hand, could make market power possible but do not presuppose such power. Consequently market shares may be used in a group exemption creating a safe-harbour to agreements without antitrust concern, but must be supplemented by other variables in a developed market power analysis. To be credible, such analysis would have to consider variables such as barriers to entry, industrial structure and general pace in innovation, access to capital etc. Thus if used as a general indication the Commission's statement in itself would seem to neglect large parts of modern industrial organisation theory, which stresses that market shares are a very poor general proxy for market power. This is partly recognised by the Commission, but as it would involve significant enforcement costs to undertake full analysis in every single case, the market share proxy is considered the only possible alternative as it also creates a link between a more economic approach and legal certainty.[182]

It seems the relative ease of market share estimation and comparison has been the reason for the extensive role these have been given in the European Policy. Yet small market participants and potential competitors may effectively discipline even a very dominant firm. The concept of potential competition is recognised in European antitrust but is too vaguely developed. As markets become increasingly integrated and transparent, not only in Europe but also on a global level, the potential threat of possible entrants facing incumbent firms may be a decisive factor in their behaviour. Analysing the plausibility of entry by new competitors and expansion of current competitors, the barriers to entry and expansion must thus be assessed. In the Michelin case[183] the Court noted that the cross-elasticity of supply to the existence of a dominant position was a relevant factor in assessing the market, but ignored the fact that a factory for producing heavy tires could actually be built by competitors, on the ground that it would take time.[184] It is correct that the time factor might be decisive, since the incumbent firm might change its behaviour as soon as rivals are investing to enter the market, thereby eliminating the profit of entry. Yet it is generally hard for a firm that has become inefficient, living on monopoly rents, to switch

over and immediately act efficiently. In addition, in order to respond accurately the incumbent firm would have to possess excessive production capacity in order to meet the increased demand at a competitive level. The existence of such excessive capacity could have a game theoretical deterrent effect signalling commitment of the incumbent firm to remain in the market. However, investments are not disadvantages particularly facing latecomers. In addition, they do not last eternally but need to be periodically renewed. Considering plants and networks as barriers has consequently been criticised since they do not confer upon the holder any power to engage in monopolistic pricing activities, nor do they present any material difficulties for firms interested in participating in the long-term market for innovation.[185] Furthermore, a rapid pace of change could make collusion more difficult and dominance more temporary, simultaneously as the result of increased need for large R&D expenditures could mean an extra barrier to entry. Thus, the industries where developments occur with relatively little R&D expenditure, not being so interesting to antitrust, must be distinguished.[186]

The somewhat restrictive treatment of potential competition as a factor diminishing anticompetitive concerns is inconsistent with the tendency to regard joint venture parties as potential competitors. Hopefully a new more realistic tendency is detected starting with Elopak/Metal Box-Odin.[187]

The provisions in Regulation 418/85 are rather focused on parties' independence on the future product market. Access to results by all the parties is emphasised in order to realise the benefits of increased dissemination and reduced duplication in R&D work, and the stimulation of new advances through exchange of complementary technical knowledge.[188] These provisions could thus be important remedies to antitrust concerns in the specific case. However, if added to each other and applied on every contract they may deter beneficial cooperation or produce nonoptimal contracts as the conducts proscribed may be effective remedies to market imperfections. The right to sublicense others' background knowledge might be too tight strait-jacket, discouraging cooperation.[189] In addition, if venture partners may not be prevented from challenging intellectual property rights, owners may hesitate to bring competitors into technology for which there are no completely safe patents or valid applications for patents.[190] From an economic point of view the permission in Art 4(1)(e) to restrict the field of use of the R&D results and the prohibition of customer restric-

tions in Art 6(e) seem inconsistent, since they are alternative means of dividing product markets.

The Commission's opinion on post-innovative cooperation is not totally clear. In the Notice on joint ventures a positive view of pure R&D agreements is maintained. However in recital 7 to regulation 418/85, joint exploitation is seen as a natural part of joint R&D. The doctrine of ancillary restrictions also displays some questionable features. The decision on whether the main transaction has anticompetitive effects will be determinant for any additional restraint considered necessary. If the main transaction is regarded as having anticompetitive effects and Community impact, the analysis will go on to consider the grounds for exemption. Again the different specifics are usually not considered and estimated individually, not even when assessing their indispensability.[191]

The Commission has "recently become enamored of the concept of 'essential facility' as indicative of dominance, defining an essential facility as a facility or infrastructure without access to which competitors cannot provide services to their customers."[192] If a firm controls such facility it will negatively effect the possibility for others to enter. Still, the number of cases where such facility is determinant are probably rather few which is why the practical impact of the concept is likely to be limited. One could however think of cases in innovation industry where such possession e.g. specialists or key-patents might be decisive. It is however unclear whether and to what extent the essential facility doctrine is applicable to intellectual property rights.

Conclusion: The important concern for antitrust relating to R&D is keeping the incentives high for the performing parties, thus promoting progress. Market power in current product markets implies incentives to slow down pace in innovation. When assessing potential market power and the anticompetitive effects of an agreement market share alone is a very poor proxy. Analysis has to be supplemented by many other factors affecting the possibility of market power abuse. In the part of the analysis concerned with pure innovation analysis the main anticompetitive concern is whether the cooperation forecloses potential competitors. In all analysis of potential competition, important barriers to entry should be carefully assessed. Irrecoverable investments made by incumbent firms may act as a deterrent to potential entrants but should not be exaggerated in the long-run R&D perspective.

Efficiencies

Efficiency assessment. As noted several times earlier, dynamic efficiencies are an inherent part of joint R&D efforts. As Brodley argues, antitrust policy should give priority to innovation and production efficiency, and the protection of consumer interests can be assured by preserving competitive processes over the long run.[193] The antitrust enforcement must therefore not merely focus on promoting allocative efficiency in the output markets. However, maximisation of dynamic efficiency implies efficient conduct of the firms. Since such conduct is best monitored through competition there must remain static efficiency, which is why the different efficiencies cannot be seen as counterparts but as interrelated variables.

Dynamic efficiencies in particular make heavy demands on antitrust execution. These are often impossible to foresee and assess ex ante, especially since they are the possible future outcome of activity characterised by large uncertainty. When assessing dynamic efficiency, as opposed to static efficiency – we move from the realm of reasonable prediction to the realm of speculation.[194] The same problems face merger analysis. Recent reviews of economic studies conclude that projections of merger efficiencies were "surprisingly and consistently inadequate". Despite near-unanimous predictions of future profit, fully 60-80% of mergers were regarded as unsuccessful ex post.[195]

If cooperation will bring a new competitor or a new technology quickly onto the market or create a counterweight to an existing dominant enterprise, the Commission is often willing to accept a joint venture, rather than trying to force the parent companies to enter the market separately at some future date. It displays a short-term pragmatic preference for immediate concrete results rather than less certain, long-term but potentially greater advantages. Such discount of future uncertain benefits is correct according to economic theory, but the Commission does not carry out any quantification of such matters.[196] In addition, the gains of cooperation recognised by the Commission are to a large extent connected to integrating effects on the European market. In the Fifteenth Report on Competition Policy, cross-frontier R&D collaboration within the Community is seen as helping to open up national markets. The Community's poor performance in high technology is mainly due not to too low a level of expenditure on

R&D, but rather to the low productivity of such expenditure which is itself due to the fragmentation of markets and supply. "International R&D collaboration can enlarge markets and supply for the products… incorporating the results of the joint research to a Community or even world scale."[197] It should also be remembered that Art 81(3) demands that the ultimate buyers receive a fair share of the benefits of cooperation. This condition ought to be interpreted rather flexibly, and efficiencies should not be conditioned on an immediate and total pass-on of cost savings to consumers. Production and innovation economies confer large social benefits, far exceeding the gains from allocative efficiencies, even when not immediately passed on to consumers.[198] There is a potential risk of efficiencies to the firms being of subordinate importance in the assessment and forced integration having a hampering effect, the opposite of its original intention.

Conclusion: R&D analysis should emphasise possible long-term dynamic benefits. Through these efficiencies, Community integration will be attained on its own merits and consumer welfare will receive its inherent due via the market. Because of the difficulties in the ex ante assessment the Authorities should not be forced to make the final decision on this stage. A system of ex post monitoring would allow more accuracy in the analysis.

Trade-offs

The Aim of the Trade-off. The Commission recognises that exemptions according to 81(3) are to be decided according to the overall economic balance. However in reality, the trade-off is not as well developed as appearances might suggest.

Similar to what Williamson calls a naïve trade-off model, a cost-benefit analysis reduced to two-dimensional terms requires a number of qualifications such as timing, non-price competition, X-inefficiencies, response of firms, income distribution effects, second-best considerations, inference and enforcement expenses, which will limit the operationality of the analysis.[199] Furthermore, due to the diverse nature of the conditions of Art 81(3), the execution cannot rely on a strict welfare analysis but will often require political compromise between conflicting and incommensurable values.[200]

While the European competition rules are designed to maintain "effective competition" this is an essential point, a decisive criterion. As a consequence there is no real possibility to justify a pure efficiency defence.[201]

Modern joint ventures frequently fall under the jurisdiction of more than one antitrust system, due to the extraterritoriality and impact of modern competition laws (read US and European Community competition law). Problems of simultaneously satisfying both systems arise.[202] An advantage of creating an antitrust enforcement model based on express economic criteria in its application, is the potential for being universally acceptable. More importantly, such outspoken economic analysis would demand explicit economic assessments in decisions and judgements, capable of being evaluated on economic grounds by economists. A lively debate, scrutinising the alleged economic effects of single European cases from an economically consequential point of view, would presumably spur improvements in the execution, ending in foreseeable results of antitrust analysis. As European integration advances towards its completion, an evolution of the Competition law's objective ought to be politically acceptable.

The Execution. The severe problems of foreseeing future market developments and estimating future efficiencies may lead to both over- and under-inclusive policy. Over-inclusive in blocking collaboration justifiable on efficiency grounds due to inability to predict future efficiencies or under-inclusive in permitting unproductive collaboration out of fear of hampering efficient cooperation.[203] As anticompetitive concerns are most inherent in static efficiency analysis while benefits from R&D are most of all dynamic, and as economic theory and empirical evidence clearly stress the prevailing importance of dynamics, the practical conclusion ought to be that a under-inclusive policy is to be preferred if the choice has to be made.

Indeed some European cases imply that dynamic efficiencies are treated as decisive. In the BT/MCI case,[204] a strategic alliance in the telecom area where British Telecom acquired 20% in MCI and created a joint venture in the field of value added services, received an individual exemption due to expected technical progress and the ongoing liberalisation process. The venture would offer new, more advanced global services more quickly than either could alone, and there was no risk of eliminating competition. In Optical Fibres[205] a network of joint ventures were exempted, after substantial amendments in the structure and restrictive provisions of the ven-

tures.[206] The ventures would provide for a fast conversion into optical fibres technology, used mainly in telecommunications.

Market Power Abuse. Even if a dominant position emerges on a market, it can be monitored by Art 82. This is relevant to the implementation of art 81 as it is a remedy for market power accidentally "slipping through" the pre-domination net. It is very important to note in the R&D context that lawful possession of an intellectual property right does not protect one from antitrust scrutiny by the Authorities. If the position is abused by the conduct of the dominant enterprise, through the use of the IPR, Art 82 will be violated.[207] In Magill[208] the Court declared that the European Commission "under exceptional circumstances" under Art 82 had the power to impose compulsory copyright licences and to require a firm to supply new customers. Not the exclusive intellectual property as such, but the exercise of the right, can under such circumstances give rise to an abuse. The Court made it very clear that the absence of any justification was a crucial factor for its decision, but did not give an idea as to what justifications might exist. There is thus some scope for using art 82 to monitor proprietors of intellectual property rights.

Conclusion: The choice whether to approve a proposed cooperation ought to be decided by the trade-off between potential anticompetitive effects and presumed efficiencies. In R&D the inherent benefits are of a dynamic nature which is why static efficiency should be pursued only as far as it deters the parties from slowing down the innovative process. Especially when including ex-post assessment, the Authorities may relax their concerns about static inefficiencies not being outweighed by long-term dynamic efficiencies.

Concluding Remarks

Recent industry developments should be important to the general perception of R&D cooperation and the commercialisation of its results. The production of knowledge, preceding the actual product production stage - if traditional production exists at all - is the core of what is commonly

called the new economy. Such activity is by far more uncertain and complex to foresee and calculate than traditional industrial operations. As a consequence, the price of the finished product reflects no longer so much costs of raw material, labour, transportation and sale, but the revenue for making the R&D efforts or taking the financial risk of developing ideas with a potential industrial application. The increased uncertainty and risk, and the economic characteristics of knowledge production, imply an increase in the importance of giving proper incentives to undertake the activity in the first place.[209] The award for producing knowledge is often a short period of being alone in the market with the new technology while charging a price that recoups costs of development and rewards risk. This is the rationale for patents and other intellectual property rights. The protection from competition, in scope and time, which patents provide, are still important to innovators, but in different ways. In some sectors the development is so fast that the product or technology will be replaced long before the patent expires. In the latter industries appropriation of the benefits of new technology takes different ways, such as horizontal and vertical licensing and joint ventures. The speed of technological change leads to short product life cycles which, because of the relatively short period of time in the sun for an actor controlling the top technology, may diminish antitrust concerns or at least call for new criteria for assessing dominance. On the other hand it means that the flow of new technology must be safeguarded. If not updated, competition law risks remaining too focused on competitiveness in product markets and cannot really appreciate the innovative efficiencies and concerns.

To fully extract the social benefits of competition law, it must – wherever possible – focus on market structures threatening innovation (dynamic) efficiencies. The development of methods for a credible weighing of efficiencies is a delicate task, especially important for technological progress industries driven by product and process innovation, where the application of a static equilibrium model may be harmful.[210] Tools are needed that strike a balance between what is safeguarding incentives and opportunities for continued fast innovation and what is mere anticompetitive suppression of competition in present and future markets. If assessed by old models of measurement, great potential consumer welfare through technological development may be sacrificed in pursuit of instant price reductions.

As most joint ventures eventually are exempted under European Competition Law, the major problem is however not a restrictive practice as such. It is the cost and time lag of exemption, uncertainties and the risk of having the Commission altering the relative bargain power and imposing unnecessary limitations on the venture, which all act to force the parties to form their agreements in such a way as to fall under the group exemption or at least to adopt its principles.

The situation could be ameliorated by abolishing the mandatory notification system which, while answering to the proposed modernisation of the rules implementing art 81 and 82[211], would allow the parties to answer for the legal assessment by use of traditional legal sources and elaborated guidelines. Such a development might create participants with larger market shares. If however greater emphasis is placed on supervision and monitoring of the concentrations thus created, the market may achieve the composition which the underlying conditions demand without too much interference from Antitrust authorities. If these actors actually abuse their position, the Authorities will be able to react. This would imply a system with the prime objective of attaining economic efficiency, enabling the welfare enhancing innovative efficiencies to prevail over allocative efficiencies but at the same time not permanently suppressing interfirm rivalry. While caring for consumers through their inherent role on the market, such system could be politically feasible to attain. The latter is especially true as incentives are given to seek the restrictions least harmful to consumers among reasonably available alternatives.[212]

To optimise the value of a technology, complementary assets of several firms usually must be joined together. Integration, joint ventures, licensing agreements etc are here alternative means of bringing these together. The efficient choice should be decided by the underlying attributes of the transactions.[213] A system of Guidelines could make it possible for a broader coherence among different kinds of regulations, applicable to organisation forms and business solutions, which from a business perspective are alternatives. If the legal treatment is dependent on the long-run effect, irrespective of legal form, the parties are in a better position to make the decision that they perceive to be the most efficient for their specific conditions.

A convergence of the regulatory aims and the practical execution between the most important international jurisdictions (Europe and U.S.),

would further the development of an externally coherent treatment. If equivalent treatment can be anticipated, there will be predictability even though the transaction will be scrutinised by more than one authority. This should also be in line with the ambitions of further collaboration between the respective authorities.

In order to realise the true benefits of a market economy, where the singling out of the conduct most appropriate to the situation is taken care of by the market, we must limit antitrust concerns to cases where market characteristics make long-run monopolistic behaviour possible. These conclusions apply a fortiori to the R&D setting where neither the authorities, nor anybody else, is in a position to predict the future impact and outcome of the measures and transactions taken. An important advantage with the Guideline system, is the ex post evaluation of a transaction. A system relying on complaints by harmed or foreclosed competitors, dissatisfied customers and observant government officials can focus the resources on cases where actual harm is done to competition. To rebut allegations of illegal anticompetitive behaviour, the party against which the allegation is levelled should be able to show a conduct in conformance with the principles of the Guidelines and in border-line cases, a valid independent economic reason for its behaviour.

Endnotes

[1] Arquit, "The boundaries of horizontal restraints: facilitating practices and invitations to collude" *61 Antitrust Law Journal*, 1993, p.532 with reference to Copperweld Corp v. Independence Tube Corp., 467 U.S. 752, 768-769.

[2] Arquit, "The boundaries of horizontal restraints: facilitating practices and invitations to collude" *61 Antitrust Law Journal*, 1993, p.535

[3] Brodley, "The Economic Goals of Antitrust: Efficiency, Consumer Welfare, and Technological Progress" *62 New York University Law Review*, p. 1020.

[4] Brodley, "Proof of Efficiencies in Mergers and Joint Ventures, *64 Antitrust Law Journal*, p. 581.

[5] OECD, *Competition Policy and Efficiency Claims in Horizontal Cooperation Agreements*, p. 6.

[6] Ordover & Willing, "Antitrust of High-Technology Industries: Assessing Research Joint Ventures and Mergers", *Journal of Law & Economics*, 1985, p.311.

[7] See Viscusi, Vernon, Harrington Jr., *Economics of regulation and antitrust*, 1995, p.73, and Gellhorn & Kovacic, *Antitrust Law and Economics*, 4 ed., 1994, p.52 ff.

[8] See Pindyck & Rubinfeld, *Microeconomics*, 1998, pp. 611 ff.

[9] Brodley, "The Economic Goals of Antitrust: Efficiency, Consumer Welfare, and Technological Progress, *62 New York University Law Review, p. 1026 ff.*

[10] OECD Working Papers, Application of Competition Policy to High Technology Markets, 1997, p. 9.

[11] Scherer & Ross, *Industrial Market Structure and Economic Performance*, 1990, p.667.

[12] Scherer, "Antitrust, Efficiency, and Progress", *62 New York University Law Review*, 1987, p. 1001.

[13] Brodley, "The Economic Goals of Antitrust: Efficiency, Consumer Welfare, and Technological Progress", 62 *New York University Law Review*, 1987, p. 1029.

[14] Brodley, "Proof of Efficiencies in Mergers and Joint Ventures" *64 Antitrust Law Journal*, 1996, footnote 30 with reference to case United States v. Corn Prods. Refining Co., 234 F. 964 (S.D.N.Y. 1916)

[15] Sherer & Ross, *Industrial Market Structure and Economic Performance*, 3 ed., 1990, p. 660.

[16] These are only mentioned here and will be further described below.

[17] Poyago-Theotoky, *Competition, Cooperation and Development – The Economics of Research Joint Ventures*. 1997, p.3.

[18] See Grossman & Shapiro, "Research Joint Ventures: An Antitrust Analysis" *Journal of Law, Economics and Organization*, 1986, p. 319.

[19] Grossman & Shapiro, "Research Joint Ventures: An Antitrust Analysis" *Journal of Law, Economics and Organization*, 1986, p. 319.

[20] Poyago-Theotoky, *Competition, Cooperation and Development – The Economics of Research Joint Ventures*. 1997, p.1.

[21] Poyago-Theotoky, *Competition, Cooperation and Development – The Economics of Research Joint Ventures*. 1997, p.1, with reference to Arrow, "Economic Welfare and the Allocation of Resources for Inventions" in Nelson, R. (ed), *The Rate and Direction of Inventive Activity*, Princeton, 1962.

[22] Mansfield et al. "Social and Private Rates of Return from Industrial Innovations", *The Quarterly Journal of Economics*, 1977, pp. 233 f. The report contained the results from seventeen case studies, exemplified the divergence between the returns. Median estimated social rate of return was about 56% whereas the median private rate of return was about 26%. The particular survey however goes back to the early 70's.

[23] Ex ante benefits: Grossman & Shapiro, "Research Joint Ventures: An Antitrust Analysis" *Journal of Law, Economics and Organization*, 1986, p. 321. Katz, "An Analysis of Cooperative Research and Development", *Rand Jounal of Economics*, 1996, p.527. Kattan, "Antitrust analysis of Technology Joint Ventures: allocative efficiency and the rewards of innovation", *61 Antitrust Law Journal*, 1993, pp. 938 ff.

[24] Kattan, "Antitrust analysis of Technology Joint Ventures: allocative efficiency and the rewards of innovation", *61 Antitrust Law Journal*, 1993, p. 942.

[25] Economies of cooperation: OECD, *Competition Policy and Joint Ventures*, 1996, pp. 19 f. Grossman & Shapiro, "Research Joint Ventures: An Antitrust Analysis" *Journal of Law, Economics and Organization*, 1986, p. 322 f. Katz, "An Analysis of Cooperative Research and Development", *Rand Jounal of Economics*, 1996, pp.527 f. Kattan, "Antitrust analysis of Technology Joint Ventures: allocative efficiency and the rewards of innovation", *61 Antitrust Law Journal*, 1993, pp. 938 ff.

[26] Price discrimination means to be able to charge the buyer equivalent to his willingness to pay. In practice it is very hard for the seller to identify this amount for every buyer and he will therefore be forced to charge a more or less identical price for all.

[27] Ex post dissemination: Jaquemin, " Goals and Means of European Antitrust Policy after 1992" in Demsets & Jaquemin, *Anti-trust Economics*, 1994, p. 38. Grossman & Shapiro, "Research Joint Ventures: An Antitrust Analysis" *Journal of Law, Economics and Organization*, 1986, p. 323. Katz, "An Analysis of Cooperative Research and Development", *Rand Jounal of Economics*,1996, pp.528 f. Kattan, "Antitrust analysis of Technology Joint Ventures: allocative efficiency and the rewards of innovation", *61 Antitrust Law Journal*, 1993, pp. 938 ff.

[28] Jaquemin, A. " Goals and Means of European Antitrust Policy after 1992" in Demsets & Jaquemin, *Anti-trust Economics*, 1994, p. 35. See also the chapter on Transaction Cost approach under 2.3.4.2.

[29] Moral Hazard – one party's incentive to draw benefits at the expense of the other in a contractual situation. Adverse selection – only those who by private information may benefit at the expense of the other party will sign a contract.

[30] Reduced competition in research market: Jaquemin, Alexis. " Goals and Means of European Antitrust Policy after 1992" in Demsets & Jaquemin, *Anti-trust Economics*, 1994, p. 41. Jaquemin, Alexis. " Goals and Means of European Antitrust Policy after 1992" in Demsets & Jaquemin, *Anti-trust Economics*, 1994, p. 38. Grossman & Shapiro, "Research Joint Ventures: An Antitrust Analysis" *Journal of Law, Economics and Organization*, 1986, p. 324 f. Katz, "An Analysis of Cooperative Research and Development", *Rand Jounal of Economics*,1996, pp. 529 f. Kattan, "Antitrust analysis of Technology Joint Ventures: allocative efficiency and the rewards of innovation", *61 Antitrust Law Journal*, 1993, pp. 944 f.

[31] See 2.1.1. for explanation of Externality.

[32] Scherer, "Antitrust, Efficiency, and Progress" *New York University Law Review*, 1987, p. 999. The term X-inefficiencies steams from Harvey Leibenstien, "Allocative Efficiency vs. 'X-Efficiency'", *56 American Economic Review*, 1966 p. 392. Monopolists have less incentive to act at a competitive level.

[33] Reduced competition in product markets: Grossman & Shapiro, "Research Joint Ventures: An Antitrust Analysis" *Journal of Law, Economics and Organization*, 1986, p. 324 f. Kattan, "Antitrust analysis of Technology Joint Ventures: allocative efficiency and the rewards of innovation", *61 Antitrust Law Journal*, 1993, pp. 944 ff.

[34] Grossman & Shapiro, "Research Joint Ventures: An Antitrust Analysis" *Journal of Law, Economics and Organization*, 1986, p. 327.

[35] For these models see OECD Working Papers, *Competition Policy and Efficiency Claims in Horizontal Cooperation Agreements*, pp. 6 ff.

[36] Brodley, "Proof of Efficiencies in Mergers and Joint Ventures", *64 Antitrust Law Journal*, p. 584.

[37] Grossman & Shapiro, "Research Joint Ventures: An antitrust Analysis", *Journal of Law, Economics and Organization*, 1986, p. 328.

[38] Grossman & Shapiro, "Research Joint Ventures: An antitrust Analysis", *Journal of Law, Economics and Organization*, 1986, p. 329 f.

[39] Grossman & Shapiro, "Research Joint Ventures: An antitrust Analysis", *Journal of Law, Economics and Organization*, 1986, p. 330.

[40] Katz, "An Analysis of Cooperative Research and Development" *Rand Journal of Economics*, 1996, p.538.

[41] Temple Lang, J. "European Community Antitrust Law: Innovation Markets and High Technology Industries" *Fordham International Law Journal*, 1997, p. 718ff, with an extensive list of characteristics and implications to antitrust.

[42] Dr E. Bruce Merrifield, Assistant Secretary for Productivity, Technology and Development cited in Ordover & Willing, "Antitrust of High-Technology Industries: Assesing Research Joint Ventures and Mergers", *Journal of Law & Economics*, 1985, p. 311.

[43] Shumpeter, *Capitalism, Socialism and Democracy*, 1950.

[44] Landman, "The Economics of Future Goods Markets", *World Competition, Law and Economics Review*, 1998, p. 69 with reference to Arrow, K. "Economic Welfare and the Allocation of Resources to Invention" in *The Rate and Direction of Inventive Activity*, Princeton University Press, 1962.

[45] Landman, "The Economics of Future Goods Markets", *World Competition, Law and Economics Review*, 1998, pp. 68f. OECD Working Papers, *Application of Competition Policy to High Technology Markets*, 1997, p. 7.

[46] Bellamy & Child, *Common Market Law of Competition*, 1993, § 2-015,

[47] See Council Regulation 17/62 Implementing EEC Treaty Articles 85 & 86 and e.g. Grikscheit, "Are We Compatible? Current European Community Law on the Compatibility of Joint Ventures with the Common Market and Possibilities for Future Development" *92 Michigan Law Review*, 1994, p. 969.

[48] See Notice concerning the assessment of cooperative joint ventures pursuant to Article 85 of the EEC Treaty, especially point 3 and 5.

[49] Bellamy & Child, *Common Market Law of Competition*, 1993, § 5-094 and Gutterman, *Innovation and Competition Policy*, 1997, p. 343.

[50] Notice concerning the assessment of cooperative joint ventures. Point 5, 18.

[51] Regulation 418/85, Recital 7.

[52] Notice concerning the assessment of cooperative joint ventures. Point 17.

[53] Gutterman, *Innovation and Competition Policy*, 1997, p. 343

[54] Notice concerning the assessment of cooperative joint ventures. Point 18 – 31.

[55] Notice concerning the assessment of cooperative joint ventures. Point 18. 56/65 *Technique Manière v Maschinenbau Ulm* [1966] ECR 235, *ECR 900*, OJ 1990 l228/31 [1992] 4 CMLR 54. The latter concerning the development, manufacture and distribution of a pan-European digital cellular mobile telephone system, the GSM. Even though all the major European mobile phone companies were involved the agreement was not considered to constitute a restriction of competition due to the high costs, risks and need for qualified engineers. Noteworthy is the appraisal by the Commission of the relevant market being "characterised by narrowly limited demand".

[56] Gutterman, *Innovation and Competition Policy*, 1997, p.348.

[57] *Thirteenth Report on Competition Policy*, 1983, point 55. The questions have later been reconfirmed and developed in the Notice concerning the assessment of cooperative joint ventures, point 19.

[58] *VW/MAN*, OJ 1983 L376/11 [1984] 1 CMLR 621.

[59] *Clima-Chappée*, OJ 1969 L 195/1 [1970] CMLR D7. *KEWA*, OJ 1976 L51/15 [1976] 2 CMLR D15.

[60] *KSB/Goulds/Lowara/ITT*, OJ 1991 L19/25 [1992] 5 CMLR 55.

[61] *Vaacum Interrupters (No.1)*, OJ 1977 L48/32 [1977] 1 CMLR D67. Gutterman, *Innovation and Competition Policy*, 1997, pp. 349, 377.

[62] *Elopak/MetalBox-Odin*, OJ 1990 L209/15 [1991] 4 CMLR 832.

[63] Notice concerning the assessment of cooperative joint ventures, point 33, 34.

[64] Bellamy & Child, *Common Market Law of Competition*, 1993, § 5-101.

[65] *De Laval/Stork*, OJ 1977 L215/11, [1977] 2 CMLR D69.

[66] *Beecham/Parke-Davis*, OJ 1979 L70/11, [1979] 2 CMLR 157.

[67] Bellamy & Child, *Common Market Law of Competition*, 1993, § 5-041.

[68] Gutterman, *Innovation and Competition Policy,* 1997, p. 354.

[69] *Wano/Schwartzpulver*, OJ 1978 L322/26 [1979] 1 CMLR 403

[70] *Montedison/Hercules*, *Seventeenth Report on Competition Policy*, 1987, point 69.

[71] Notice concerning the assessment of cooperative joint ventures, point 21, 22.

[72] Gutterman, *Innovation and Competition Policy,* 1997, p. 351.

[73] Notice concerning the assessment of cooperative joint ventures, point 23 - 25

[74] *Eurosport*, OJ 1991 L63/32 [1991] 4 CMLR 228.

[75] *KSB/Goulds/Lowara/ITT*, OJ 1991 L19/25 [1992] 5 CMLR 55.

[76] *Eirpage*, OJ 1991 L306/22 [1991] 4 CMLR 233. Gutterman, *Innovation and Competition Policy,* 1997, p. 352, footnote 117.

[77] Notice concerning the assessment of cooperative joint ventures, point 26

[78] Gutterman, *Innovation and Competition Policy,* 1997, p.350.

[79] Notice concerning the assessment of cooperative joint ventures, point 27 – 31.

[80] Notice concerning the assessment of cooperative joint ventures, point 58.

[81] Ibid. See e.g. *KSB/Goulds/Lowara/ITT*, OJ 1991 L19/25 [1992] 5 CMLR 55, *Olivetti/Canon*, OJ 1988 L52/51 [1989] 4 CMLR 940, *Continental/Michelin*, OJ 1988 L305/33 [1989] 4 CMLR 920

[82] *WANO/Schwartzpulver* OJ 1978 L322/26 [1979] 1 CMLR 403.

[83] Notice concerning the assessment of cooperative joint ventures, point 56.

[84] Bellamy & Child, *Common Market Law of Competition*, 1993, § 3-027, 3-028, with references e.g. to; Cases 56&58/64 *Consten & Grundig v. Commission* [1966] ECR 299 *and VBVB and VBBB v. Commission*, OJ 1982 L54/36 [1982] 2 CMLR 344.

[85] Notice concerning the assessment of cooperative joint ventures, point 57.

[86] Gutterman, *Innovation and Competition Policy,* 1997, p. 357. Notice concerning the assessment of cooperative joint ventures, point 55.

[87] *KEWA* OJ 1976 L51/15 [1976] 2 CMLR D15.

[88] See e.g. *Seventh report on Competition Policy*, 1977, point 150. *Optical Fibres*, OJ 1986 L236/30, *Ford/Wolkswagen*, OJ 1993 L20/14 [1993] 5 CMLR 617, *KSB/Goulds/Lowara/ITT*, OJ 1991 L19/25 [1992] 5 CMLR 55

[89] Gutterman, *Innovation and Competition Policy,* 1997, p. 358.

[90] Notice concerning the assessment of cooperative joint ventures, point 60.

[91] *Asahi/St. Gobain,* OJ 1994 L354/87.

[92] Notice concerning the assessment of cooperative joint ventures, point 65.

[93] Notice concerning the assessment of cooperative joint ventures, point 65, 66.

[94] *Elopak/Metal Box-Odin,* OJ 1990 L209/15 [1991] 4 CMLR 832

[95] *ECR 900,* [1990] O.J. L228/31, [1992] 4 C.M.L.R. 54

[96] Notice concerning the assessment of cooperative joint ventures, point 64.

[97] Notice concerning the assessment of cooperative joint ventures, point 17.

[98] Concil Regulation (EEC) No 4064/89 OJ L 257, 21.9.1990, p.13 as last amended by Regulation (EC) No 1310/97 OJ L 180, 9.7.1997, p.1.

[99] Commission Regulation No 418/85 of 19 December on the application of Article 85(3) of the Treaty to categories of research and development agreements. Amended by Commission Regulation No 151/93 of 23 December 1992 amending Regulations No 417/85, No 2349/84 and 556/89 on the application of Article 85(3) of the Treaty to certain categories of specialization agreements, research and development agreements, patent licensing agreements and know-how licensing agreements.

[100] Article 1(1) and Recital 7 of the Regulation.

[101] Expressed e.g. in *Continental/Michelin* OJ 1988 L305/33 [1989] 4 CMLR 920.

[102] *Fifteenth Report on Competition Policy*, 1985, point 284.

[103] Art 7 treats the opposition procedure, Art 1 – 3 contain the basic conditions and Art 5 contains the black list.

[104] Commission's Notice on Subcontracting, O.J. 1978, C1/2. Korah, *R&D and the EEC Competition Rules Regulation 418/85*, 1986, pp. 24f. Venit, "The Research and Development Block Exemption Regulation", *European Law Review, 1985*, p. 154.

[105] See Korah, *R&D and the EEC Competition Rules Regulation 418/85*, 1986, p. 26 and White, "Research and Development Joint Ventures under EEC Competition Law", *ICC, 1985 p.681*.

[106] White, "Research and Development Joint Ventures under EEC Competition Law", *ICC, 1985*, p. 682 and Korah, *R&D and the EEC Competition Rules Regulation 418/85*, 1986, p. 27.

[107] Art 1(2) (d), Höög, Forsknings- och utvecklingsavtal under EG:s konkurrensregler, *SvJT*, p. 457.

[108] Art 2 (d)

[109] See also Recital 7.

[110] Art 2 (f)

[111] Art 3 (2)

[112] Art 3a.

[113] According to Recital 2 joint ventures that does not include the stage of industrial application, generally does not fall within Art 81(1).

[114] Korah, *R&D and the EEC Competition Rules Regulation 418/85,* 1986, p. 34. White, "Research and Development Joint Ventures under EEC Competition Law", *ICC, 1985,* p. 685.

[115] Höög, Forsknings- och utvecklingsavtal under EG:s konkurrensregler, *SvJT,* p. 461.

[116] Art 3 (1)

[117] Korah, *R&D and the EEC Competition Rules Regulation 418/85,* 1986, p. 33

[118] Art 3 (3)

[119] See Recital 16.

[120] Art 4 (1) a.

[121] Art 4 (1) b.

[122] Art 4 (1) c, d.

[123] Art 4 (1) e.

[124] Art 4 (1) f.

[125] Art 4 (1) fa, fb.

[126] Art 4 (1) fc.

[127] Art 3 a.

[128] Art 4 (1) g.

[129] Recital 11, Art 5 (2) and Gutterman, *Innovation and Competition Policy,* 1997, p. 298.

[130] Art 5 (1) a.

[131] Art 5 (1) b.

[132] Art 5 (1) c, d, e.

[133] Art 5 (1) f.

[134] Art 5 (1) g.

[135] Art 5 (1) h.

[136] Korah, *R&D and the EEC Competition Rules Regulation 418/85,* 1986, p. 39. This further means that the opposition procedure of the Regulation will not be available.

[137] See Korah, *R&D and the EEC Competition Rules Regulation 418/85*, 1986, p. 39.

[138] Art 6 a.

[139] Art 6 b.

[140] See White, "Research and Development Joint Ventures under EEC Competition Law", *ICC, 1985*, p. 694.

[141] Art 6 c.

[142] Art 6 d, Art 4 (1) c.

[143] Art 6 g.

[144] Herein lies an economic danger which will be discussed later. A similar conclusion is drawn as regards EC Merger Control in Neven, Nuttall & Seabright, *Merger in Daylight*, 1993, p. 6 "…the Commission's analyses are insufficiently transparent to allow third parties to tell with any confidence whether their judgement in individual cases has been sound."

[145] Temple Lang, "European Community Antitrust Law: Innovation Markets and High Technology Industries" *Fordham International Law Journal*, 1997, p. 764.

[146] Brodley, "Joint Ventures and Antitrust Policy", *Harvard Law Review*, 1981-82, p. 1523f.

[147] Larsén, *Kvalitativa aspekter under konkurrensbegränsningskriteriet i Art. 85(1) EG*, p. 43.

[148] An example of very hard-interpreted legal borderlines in Reg 418/85 is the exemption of restraints of closely connected fields of parallell R&D according to (4a) but the prohibition of limitations in unconnected fields. Where is the border of a connected research? See White, "Research and Development Joint Ventures under EEC Competition Law", *ICC, 1985*, p 689.

[149] Pucket, "European Competition Law: Managing the "Chameleon" of Antitrust – Technology Joint Ventures", *19 Maryland Journal of International Law and Trade*, 1995, text to footnote 55.

[150] *De Laval/Stork*, OJ 1991 L19/25 [1992] 5 CMLR, p. 55.

[151] See e.g. Korah, *Vertical Restraints in EC competition Law*, 1998, p. 3.

[152] Korah, *Vertical Restraints in EC competition Law*, 1998, p. 7.

[153] Brodley, "Proof of Efficiencies in Mergers and Joint Ventures" *64 Antitrust Law Journal*, 1996, p. 584.

[154] Brodley, "Proof of Efficiencies in Mergers and Joint Ventures" *64 Antitrust Law Journal*, 1996, p. 584.

[155] OECD Working Papers, *Competition Policy and Efficiency Claims in Horizontal Cooperation Agreements*, 1997, p. 5.

[156] See Van den Bergh, "Modern Industrial Organisation and European Competition Law", *2 E.C.L.R*, 1996, p. 82.

[157] Van den Bergh, "Modern Industrial Organisation and European Competition Law", *2 E.C.L.R*, 1996, p. 82.

[158] OJ C372/5 [1998] 4 C.M.L.R. 177.

[159] Kattan, "Antitrust analysis of Technology Joint Ventures: allocative efficiency and the rewards of innovation", *61 Antitrust Law Journal*, 1993, pp. 937 ff.

[160] 15 U.S.C. 4301 - 4305.

[161] OECD Working Papers, *Application of Competition Policy to High Technology Markets*, 1997, p. 8.

[162] Landman, "Innovation Markets in Europe", *E.C.L.R.* 1998, p. 22.

[163] OECD Working Papers, *Application of Competition Policy to High Technology Markets*, 1997, p. 12

[164] Landman, "Innovation Markets in Europe", *E.C.L.R.* 1998, p. 22.

[165] Temple Lang, "European Community Antitrust Law: Innovation Markets and High Technology Industries" *Fordham International Law Journal*, 1997, p.760.

[166] Federal Trade Commission.

[167] Temple Lang, "European Community Antitrust Law: Innovation Markets and High Technology Industries" *Fordham International Law Journal*, 1997, p. 760 f.

[168] Gutterman, *Innovation and Competition Policy,* 1997, p. 394.

[169] Temple Lang, "European Community Antitrust Law: Innovation Markets and High Technology Industries" *Fordham International Law Journal*, 1997, p. 761.

[170] Grossman & Shapiro, "Research Joint Ventures: An antitrust Analysis", *Journal of Law, Economics and Organization*, 1986, p. 320.

[171] Hay, G.A. "Innovations in Antitrust Enforcement" *64 Antitrust Law Journal*, 1995.

[172] Landman, "The Economics of Future Goods Markets", *World Competition, Law and Economics Review*, 1998, p. 73 with reference to Gilbert and Sunshine, "Incorporating Dynamic Efficiency Concerns in Merger Analysis: The use of Innovation Markets." *63 Antitrust Law Journal*, p.569.

[173] Landman, "The Economics of Future Goods Markets", *World Competition, Law and Economics Review*, 1998, pp. 74 -85

[174] Brunell, "A Critical Appraisal of the 'Innovation Market' Approach", *64 Antitrust Law Journal*, 1995.

[175] Hay, "Innovations in Antitrust Enforcement" *64 Antitrust Law Journal*, 1995, p. 15 f., and

Rapp, T. "The Misapplication of the Innovation Analysis Approach to Merger Analysis, *64 Antitrust Law Journal*, 1995.

[176] Temple Lang, "European Community Antitrust Law: Innovation Markets and High Technology Industries" *Fordham International Law Journal*, 1997, pp. 767 f.

[177] Temple Lang, "European Community Antitrust Law: Innovation Markets and High Technology Industries" *Fordham International Law Journal*, 1997, p. 768.

[178] Hay, "Innovations in Antitrust Enforcement" *64 Antitrust Law Journal*, 1995.

[179] Assessments of anticompetitive effects, efficiencies, and the trade-off between these will be dealt with below.

[180] White, "Research and Development Joint Ventures under EEC Competition Law", *ICC, 1985*, 683. Recital 8 to Reg. 418/85.

[181] Communication from the Commission, p.21.

[182] Communication from the Commission, p.21 f.

[183] *Michelin v. Commission*. 322/81, [1983] ECR 3461; [1985] 1 CMLR 282

[184] Gutterman, *Innovation and Competition Policy*, 1997, p. 350.

[185] Gutterman, *Innovation and Competition Policy*, 1997, p. 350.

[186] Temple Lang, "European Community Antitrust Law: Innovation Markets and High Technology Industries" *Fordham International Law Journal*, 1997, p. 764.

[187] *Elopak/Metal Box-Odin*, OJ 1990 L209/15 [1991] 4 CMLR 832. See section 4.3.1.2.

[188] Gutterman, *Innovation and Competition Policy*, 1997, p. 396. See also Recital 4.

[189] Korah, *R&D and the EEC Competition Rules Regulation 418/85*, 1986, p. 26 f.

[190] Korah, *R&D and the EEC Competition Rules Regulation 418/85*, 1986, p. 52.

[191] In *KSB/Goulds/Lowara/ITT*, OJ 1991 L19/25 [1992] 5 CMLR 55, only generally if the cooperation as such was needed to attain the benefits.

[192] Dolmans M. "Restrictions on Innovation: An EU Antitrust Approach", *66 Antitrust Law Journal*, 1998, pp. 455 ff. With reference to B&I Line vs. Sealink Harbour, [1992] 5 C.M.L.R 255.

[193] Brodley, "The Economic Goals of Antitrust: Efficiency, Consumer Welfare, and Technological Progress", 62 *New York University Law Review*, 1987, p. 1021.

[194] OECD Working Papers, *Competition Policy and Efficiency Claims in Horizontal Cooperation Agreements*, 1997, p. 8.

[195] Brodley, "Proof of Efficiencies in Mergers and Joint Ventures" *64 Antitrust Law Journal*, 1996, p. 576. With reference to Hartman, R.S. "The efficiency Effects of Electric Utility Mergers: Lessons from Statistical Cost Analysis, *17 Energy Law Journal*, pp. 401, 413-415.

[196] Temple Lang, "European Community Antitrust Law: Innovation Markets and High Technology Industries", *Fordham International Law Journal*, 1997, p. 758.

[197] *Fifteenth Report on Competition Policy*, 1985, point 282.

[198] Brodley, The Economic Goals of Antitrust: Efficiency, Consumer Welfare and Technological Progress" *62 New York University Law Review*, p.1032 ff.

[199] Jaquemin, A. " Goals and Means of European Antitrust Policy after 1992" in Demsetz & Jaquemin, *Anti-trust Economics*, 1994, p. 33.

[200] Jaquemin, A. " Goals and Means of European Antitrust Policy after 1992" in Demsets & Jaquemin, *Anti-trust Economics*, 1994, p. 34.

[201] OECD Working Papers, *Competition Policy and Efficiency Claims in Horizontal Cooperation Agreements*, 1997, p. 53 f.

[202] Grikscheit, "Are We Compatible? Current European Community Law on the Compatibility of Joint Ventures with the Common Market and Possibilities for Future Development" *92 Michigan Law Review*, 1994, p. 968.

[203] See Brodley, J.F. "Proof of Efficiencies in Mergers and Joint Ventures" *64 Antitrust Law Journal*, 1996, p. 576 f.

[204] *BT/MCI*, OJ 1994 L233/36 [1995] 5 CMLR 285.

[205] *Optical Fibres*, OJ 1986 L236/30.

[206] See Korah, "Critical Comments on the Commission's Recent Decisions Exempting Joint Ventures to Exploit Research that Needs Further Development", *European Law Review*, 1987.

[207] Such abuse has been defined as present when a "dominant firm, without objective necessity, reserves ancillary activity which might be carried out by another undertaking on a neighbouring but separate market, with the possibility of eliminating all competition from such undertaking". Dolmans, "Restrictions on Innovation: An EU Antitrust Approach", *66 Antitrust Law Journal*, 1998, pp. 455 ff.

[208] RTE and ITP v. Commission, Joined Cases C-241/91 & C242/91, [1995] E.C.R I-743, [1995] 4 C.M.L.R 718. See also Rosa Greaves, "Magill Est Arrivé …RTE and ITP v. Commission of the European Communities, 16 E.C.L.R. 244 – 247 (1995).

[209] Knowledge production has features of a public good, the consumption by a consumer does not exclude consumption by others and it is costly to produce and cheap to reproduce, which also makes it difficult to profit from.

[210] Ordover & Willing, "Antitrust of High-Technology Industries: Assessing Research Joint Ventures and Mergers", *Journal of Law & Economics*, 1985, p.311.

[211] White Paper on Modernisation of the Rules Implementing Articles 85 and 86 of the EC Treaty. Available at http://europa.eu.int/comm/dg04/entente/en/wb_modernisation.pdf.url .

[212] See Brodley, "The Economic Goals of Antitrust: Efficiency, Consumer Welfare, and Technological Progress", 62 *New York University Law Review*, 1987, p. 1038.

[213] The choice involves different kinds of transaction costs (search, negotiation, enforcement etc.) which the firms try to minimise. Such features as uncertainty, frequency and asset specificity in the transaction will be determinant for the relative costs involved. Williamson, "Antitrust Policy" in *The new Palgrave – A directory of Economics*, 1987.