

The European Regulation of Communications Software: Building a “Plattform” for Freely Interoperable Digital Expression?

By Boris ROTENBERG[?]

Imagine that, in a faraway fictitious land, A invents or expresses a series of words which have no synonyms and only make sense in that particular sequence. In order to utter competing or complementary expression, B and C need to ‘borrow’ (part of) that exact same series of words. As it turns out, copyright protection in that country enables A to monopolise or control the debate on that topic. Copyright holder A claims that B and C should pay access fees; that the copyright protection is needed for inducing creation. B and C argue that the application of the copyright impinges on their right to express information or ideas on all related aspects. In essence, this is the paper’s research question. By analogy, B and C need access to A’s interface code if they want to create software programs capable of interoperating with A’s software. For the ‘interface’ is a set of electronic keys which, so far as structure is concerned, must be precisely emulated in order to secure co-operation between programs. It is argued that software copyright holders enjoy *de facto* control over much software expression by means of the interface code; the question thus arises whether current European software laws – software regulation, competition laws – comply with the right to freedom of expression (Art. 10 ECHR).

This piece takes a first step in the analysis of the relation between European software laws and Art. 10 ECHR, with a particular focus on software interoperability. (I) The first part provides a detailed discussion of applicable laws, and describes the legal arsenal available to third parties for obtaining interoperable software goods/services. (II) Next, the paper criticises the underlying assumptions of the existing framework. It is contended (i) that third party access to interface information is not as automatic or self-evident as generally thought, and (ii) that competition law faces serious methodological problems in remedying possible abuses, as well as more fundamental legitimacy-caveats with regard to policy decisions about property or non-discrimination. (III) This debate needs to be placed in its wider constitutional setting. Software is both a means for expression, and expression in its own right in the sense of Art. 10 ECHR. Thus, software interoperability laws are foremost about enabling or limiting the right to impart *and* receive software expression. In addition, the State incurs a *positive* duty to facilitate expression, as was recognised in the *Plattform* case and the right to media pluralism. The question arises whether the State complies with the latter obligation, particularly as regards the right to non-discrimination. This is critical in the current climate of political tension between closed commercial and free (or open source) software. The paper concludes with a number of recommendations which should direct future research on this increasingly important issue.

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“There are only three cultural facts upon which a tacit accord has been reached between peoples: the adoption of the Greek and Roman alphabet; the shaving of men’s faces by a barber; and the marking of the hours of the day on a sundial.”

Pliny the Elder, Natural History, at 7.210.

“Language disguises the thought, so that from the external form of the clothes one cannot infer the form of the thought they clothe; because the external form of the clothes is constructed with quite another object than to let the form of the body be recognised.”

Ludwig Wittgenstein, Tractatus Logico-Philosophicus, at 4.002.

I. Introduction

The regulation of software has been harmonised at the European level. European software regulation aims at (so-called ‘positive’) economic integration of the European internal market for software goods and services.¹ The remainder of the market integration process (‘negative integration’) is achieved to a large extent through the enforcement of (European and national) competition laws (i.e. Antitrust). At the same time, the adoption of the European Union’s Charter of Fundamental Rights provides one more piece of evidence of a current tendency in the European integration process: increasingly, questions of a ‘constitutional’ nature are being posed at the European level.² In this context the question arises whether European software regulation should be assessed purely in the light of economic issues related to market integration, or whether the constitutional dimension – foremost, the right to freedom of expression - would shed new light on the legal position to be adopted.

The aim of the present paper is therefore to briefly explore, and emphasise the importance of further addressing, this key research question. The conclusions reached so far are two-fold. First, the paper highlights that the debate on software regulation does not merely raise economic issues, but should be scrutinised instead in the light of its broader constitutional setting. As our communications infrastructure is increasingly digitised, fundamental questions normally related primarily to the ‘content’ sphere, and to the physical (often tangible) ‘infrastructure’ segment will gradually permeate the debate on software regulation. In particular, the latter’s constitutional validity needs to be assessed against the right to freedom of expression, which arguably constitutes one of the essential tenets of any democratic State. In other words, instead of asking the classic question how to secure free expression in relation to the content and physical layers,³ the first goal of the

¹ See the Software Directive: Directive 91/250/EEC of 14 May 1991 on the Legal Protection of Computer Programs (as amended by Directive 93/98/EEC), *O.J.* 17 May 1991, L.122/42.

² For the (non binding) Charter, see *O.J.* 18 December 2000, C.364/11. Another clear example is of course the current debate on a European Constitution. For a good overview: J. Kokott, A R uth, ‘The European Convention and its Draft Treaty establishing a Constitution for Europe: Appropriate Answers to the Laeken Questions?’, 40 *Common Market Law Review* (2003), pp.1315-1345.

³ This three layer structure (which is obviously only a *model*) was recently used by some of the most acclaimed communications scholars. Lessig, for instance, persuasively points out that “[w]e understand a

paper is to point to the importance of launching a European debate on the following topic: what is the constitutional status of the logical (or code) layer in the light of Art.10 of the European Convention on Human Rights (ECHR)? Arguably, software falls within the ambit of that provision *both* as a medium for expression, and as expression in its own right. While US courts have addressed this type of claims in a number of cases,⁴ it is indeed surprising that no single author or court has yet (had to) consider(ed) this puzzle in the European context.

Second, and more importantly, it will be shown that the issue is not moot, but has practical consequences. The paper focuses on one critical point: software interoperability. Here, it is emphasised that software is now even less a stand-alone product, but lies at the heart of our communications infrastructure and processes. It is the main driver behind the convergence of telecommunications, computing and broadcasting. Software products and services – like big pebbles in a stormy river – are potential bottlenecks, determining the flow of (software and content) expression between users. It is argued that – just like our pebbles might eventually form a dam, should too many of these be randomly thrown in the river – software products/services, if not properly regulated, risk to hinder the optimal flow and diversity of information. Seen in this light, there may be strong arguments for drastically re-assessing current European software regulation on that issue, as it really matters on what terms the law induces interoperability between software elements (or expression). It is contended that current regulation might not comply with the State's positive duty to facilitate the expression of 'information' or 'ideas' (in the form of software, and otherwise), as recognised most dramatically in the *Plattform* case, but also in the right to media pluralism.

For the purposes of this paper the term 'software' does not include digital content, only executable bitstreams that instruct computers in what to do.⁵ 'Interoperability' means functional interconnection and interaction, as required to permit all elements of software and hardware to work with other software and hardware and with users in all the ways in which they are intended to function; or the ability to exchange information and mutually to use the information which has been exchanged.⁶ Moreover, while the paper often uses the

communications system by dividing it in three distinct layers. The physical layer, across which the communication travels, this is the computer or the wires. (...) In the middle is the logical or code layer – the code that makes the hardware run. (...) At the top is the content layer – the actual stuff that gets said or transmitted across those wires. Here we include digital images texts, online movies and the like. These three layers function together to define any particular communications system." See L. Lessig, *The Future of Ideas. The Fate of the Commons in a Connected World*, at p.23; Y. Benkler, 'From Consumers to Users: Shifting the Deeper Structures of Regulation', 52 *Federal Communications Law Journal* (2000) 561, at 562-3.

⁴ So far, this issue arose in two distinct types of cases, namely the constitutionality of (i) US export limitations on encryption programs and (ii) laws prohibiting copyright circumvention tools. See *inter alia* *Bernstein v. US Department of Justice*, 176 F.3d 1132 (9th Cir. 1999); *Junger v. Daley*, 209 F.3d 481 (6th Cir. 2000); *Karn v US Department of State*, 925 F. Supp. 1, 3 (D.D.C. 1996); *Universal City Studios, Inc. v. Corley*, 273 F.3d 429 (2d Cir. 2001); *Universal City Studios, Inc. v. Reimerdes*, 111 F.Supp.2d 294, (SDNY 2000). For US literature on this exact topic, see *inter alia* D.L. Burk, 'Patenting Speech.', 79 *Texas law Review* (2000) 99; L.J. Camp, S. Syme, 'Code as Embedded Speech, Machine and Service.', *Journal of Information, Law and Technology* (2001), available at <http://elj.warwick.ac.uk/jilt/01-2/camp.html>; N.A. Crain, 'Bernstein, Karn, and Junger: Constitutional Challenges to Cryptographic Regulations.', 50 *Alabama Law Review* (1999) 869; L. Tien, 'Publishing Software as a Speech Act.', 15 *Berkeley Technology Law Journal* (2000), available at http://www.law.berkeley.edu/journals/btlj/articles/15_2/tien/tien.html; R.C. Fox, 'Old Law and New technology: The Problem of Computer Code and the First Amendment.', 49 *UCLA Law Review* (2002) 871.

⁵ Definition taken from E. Moglen, 'Freeing the Mind: Free Software and the Death of Proprietary Culture.', (2003), at p.1. Available at <http://emoglen.law.columbia.edu/publications/maine-speech.html>.

⁶ Software Directive, Recitals 10-12. In contrast, interoperability in the DTV market, for instance, has been taken to mean the disappearing of authoring costs (which would be incurred in translating applications from the API for which they were written to another) or the situation in which any application can be run on any

example of operating system (OS) software, all software programs interact with hardware, or other software programs through their interfaces. Thus, the paper has a wider relevance.

Part II provides an in-detail discussion of the relevant laws: public interest regulation (i.e. mainly the EU Software Directive) and competition laws as applicable on the interoperability question. Part III explains why the current situation may not be fully satisfactory. It is argued that the applicable laws rely on underlying assumptions which are themselves open to criticism. As a result, obtaining software interoperability is a more arduous task than is generally thought. Finally, Part IV sheds new light on the argument, and puts public interest regulation and competition laws in context. The exact form of, and mix between, the various laws can only be assessed against the backdrop and aims of the overarching constitutional right to freedom of expression (Art.10 ECHR). Thus, this piece briefly analyses software interoperability from that particular viewpoint, and concludes with a number of recommendations. Incidentally, this paper aims to draw the reader's attention to the importance of starting a wide European debate on the interface between software and freedom of expression.

II. EU Software Regulation: Between Public Interest Regulation and Competition Laws

2.1 – Introduction

The concrete regulation of communications software is best conceived of as a difficult balancing exercise between public interest regulation and competition laws. European public interest regulation has a general application in the common market, and can take the form either of positive integration measures (by means of EU legislation harmonising the laws of the various MS with a view to removing trade barriers in the community), or negative integration initiatives (i.e. striking down discriminatory or indistinctly applicable MS laws which are found to hinder the free movement of services, goods, and alike in the European Community). In contrast, competition law applies on a case-by-case basis and focuses (both *ex ante* and *ex post*) on preventing anti-competitive practices of market players. In the next paragraphs, the paper describes the current regulatory picture regarding communications software. The complementary nature of competition law and public interest regulation is highlighted.

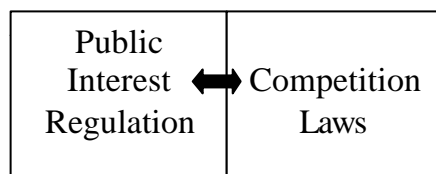


Chart 1: The Classic Tension

2.2 – Public Interest Regulation: The Copyright Holder's Potential Stranglehold

Differences in the legal protection of computer programs offered by the laws of the MS were considered to have direct and negative effects on the functioning of the common market for computer programs. As a result, the EU introduced various pieces of legislation

STB middleware and APIs. See OXERA, 'Study on Interoperability, Service Diversity and Business Models in Digital Broadcasting Markets.', February 2003, pp.6-7.

aiming to remove such hindrances to the internal market. This paper focuses on the issue of software interoperability.⁷

In fact, the technical key to interoperability has lain in the ability of the outsider to have access to the structure of the technical interfaces of software to which a connection is desired. For the 'interface' is a set of electronic keys which, so far as structure is concerned, must be precisely emulated, in order to secure co-operation between programs.⁸ Invariably, an applications program, such as a spreadsheet, will have to communicate with the operating system which in turn makes the hardware perform the necessary functions. A well-known example of critical interfaces are the Application Program Interfaces (APIs) which enable the interaction between a given Operating System (OS) and the various applications programs. Many of the tasks that those various applications are designed to accomplish are similar – e.g. drawing dialog boxes, saving documents, and providing 'help' to users. Thus, a huge duplication of efforts can be prevented by writing (or 'coding') those common tasks into the OS code. In this context, the APIs thus enable software application writers to rely on or use those tasks or lines of OS code for their applications. In sum, third party access to APIs is crucial for achieving interoperability between the OS and the applications.⁹

Similarly, there are many other interfaces to which access is needed in order to be able to enter the software market. An interface is a pre-established way to resolve potential conflicts between interacting parts of a design. It is like a treaty between two or more sub-elements. To minimize conflicts, the terms of these treaties – the detailed interface specifications – need to be set in advance and known to affected parties. Thus interfaces are part of a common information set that those working on the design need to assimilate. Interfaces ought to be visible information.¹⁰

The various rights and obligations in this relation are as follows. The Software Directive compels MS to provide copyright protection for software products (as 'literary works').¹¹ The definition of computer program is very broad, including preparatory materials and computer programs fixed in hardware (Art.1). The rightholder is entitled to restrict the unauthorized permanent or temporary reproduction in part or in whole; the translation, adaptation, arrangement and any other alteration; as well as any form of distribution of the program or copies thereof (Art.4).

⁷ Another (in)famous EU measure effecting the dissemination of software goods and services can be found in the new EU Copyright Directive (Directive 2001/29/EC of 22 May 2001 on the Harmonisation of Certain Aspects of Copyright and Related Rights in the Information Society, *O.J.* 22 June 2001, L.167/10). In brief, Art.6 thereof requires the MS to provide adequate legal protection against circumvention activities. The Directive does so by imposing protection of effective technological measures designed to protect any copyright or any rights related to copyright as provided by law or the sui generis database right. Art.6(2) then obliges MS to provide adequate legal protection against any activities, including the manufacture or distribution of circumvention devices, products or components or the provision of services to this effect. Finally, Art.7(1) requires MS to provide adequate legal protection against any person knowingly performing without authority the removal or alteration of any electronic rights-management information; or the distribution of works from which electronic rights-management information has been removed or altered without authority.

⁸ The term 'interface' has no specific technical meaning in programming. Interfaces are those features or elements of a program that are necessary for interaction between software and hardware, or between programs. What is common to them is that copying or using them may be needed in order to create interoperable programs. S. Lai, *supra*, p.213; referring to Clapes, *Software, Copyright and Competition: The "Look and Feel" of the Law* (1989), pp.181-82.

⁹ See D.S. Evans, 'The Antitrust Economics of Two-sided Markets.', *AEI-Brookings Joint Center for Regulatory Studies*, September 2002, available at <http://aei.brookings.org/admin/pdf/files/phpMt.pdf>, p.17.

¹⁰ C.Y. Baldwin, K.B. Clark, *Design Rules. The Power of Modularity*. (Cambridge Massachusetts, MIT Press, 2000), p.73.

¹¹ See Directive 91/250/EEC of 14 May 1991 on the Legal Protection of Computer Programs (as amended by Directive 93/98/EEC), *O.J.* 17 May 1991, L.122/42.

The legal provisions can best be understood having regard also to the various ‘recitals’ in the preamble, the explanatory memorandum, as well as to the legislative history of the Software Directive (*travaux préparatoires*). Art.1(2) of the Directive provides that software “expression” (i.e. code) is copyrightable subject matter, but not “ideas and principles which underlie any element of a computer program, including that which underlie its interfaces.” The legislative history makes clear that all interface *specifications* (as opposed to interface code or expression) are unprotected. Indeed, a previously existing Art.1(3) was amended. That provision provided that “[w]here the specification of interfaces constitutes ideas and principles which underlie the program, those ideas and principles are not copyrightable subject matter.” Somehow, that sentence threatened the ability to create interoperable programs in that it could be read to imply that interface specifications which did not constitute ideas and principles might be protected by copyright. The subsequent amendment of that provision highlights that all interface specifications are by their very nature unprotected subject matter.¹² In addition, it appears that small portions of interface *code* (or expression), necessary for implementing the interfaces might also be unprotected because of the lack of originality or under the ‘merger doctrine’ (which stands for the proposition that there is no copyright protection where an idea and its expression cannot be separated).¹³

This links in to the issue of reverse engineering, and, more specifically, disassembly.¹⁴ When can software writers conduct interface research? In this respect, the Directive provides that authorization of the copyright holder is not required¹⁵ where reproduction of the code and translation of its form are indispensable to obtain the information necessary to achieve the interoperability of an independently created computer program with other programs. However, this is on condition that (a) these acts are performed by the licensee or by another person having a right to use a copy of a program, or on their behalf by a person authorised to do so; (b) the information necessary to achieve interoperability has not previously been readily available to them; and (c) these acts are confined to the parts of the original program which are necessary to achieve interoperability (Art.6(1)). Art.6(2) furthermore provides that the information thus obtained may only be used for the latter purpose; and may not be disclosed to other program providers except where necessary for the interoperability of his independently created program. The bottom line is that third party access through decompilation is limited to certain well-defined *purposes* (obtaining interoperable products), *circumstances* (indispensability; unavailability; being a licensee or authorised person; and confined to the interface) and *uses* (interoperability, even when it is about disclosing the information to others).

¹² In fact, this reading is fully confirmed by the existence of Art.6 on the permissibility of decompilation acts, as explained below (i.e. Art.6). Information, obtained through decompilation, can be used only for the interface specifications. This assumes that no other provision of the Directive, including Art.1(2) restricts the use of interface specifications. See P. Samuelson, ‘Comparing US and EC Copyright Protection for Computer Programs: Are They More Different than They Seem?’, (1994) 13 *Journal of Law and Computing* 279, p.286.

¹³ See S. Lai, *The Copyright Protection of Computer Software in the United Kingdom*. (Oxford, Hart Publishing, 2000), p.48 (and footnotes) and pp.97-98; referring to Czarnota and Hart, *Legal Protection of Computer Programs in Europe – A Guide to the EC Directive*. (1991), at p.81. See also D. Bainbridge, *Software Copyright Law*. (London, Butterworths, 1999 – Fourth Edition), p.170.

¹⁴ Bainbridge emphasises that one should be careful with the terminology. Programmers ‘assemble’ the program from low level assembly language into object code; ‘disassembly’ is the process of converting a program from object code to assembly language. In contrast, ‘compiling’ is from source to object code, while ‘decompiling’ is from object to the source high level language. The latter is usually not done because you need to know the exact high level language used for this and non-executable remarks are not converted to object code during compilation and will therefore not be retrievable when decompiling. One should thus prefer the term ‘disassembly’. See D. Bainbridge, *supra*, p.154.

¹⁵ Indeed, a number of proposals for introducing a requirement that third party programmers should request the necessary information prior to engaging in decompilation were rejected. See S. Lai, *supra*, p.101.

In sum, though its critical importance cannot be doubted, making programs interoperable is not necessarily an easy task in the EU. Expression in the form of code is *prima facie* copyright protected, even when this relates to implemented interface code. In contrast, the ideas or specifications underlying these interfaces are not proprietary; nor those small portions of code which are needed for implementing the interface and which either lack originality or cannot be separated from (or are the only possible expression of) the underlying idea. At the same time, the copyright-holders have no obligation to disclose relevant interface information, needed for achieving interoperability. The Software Directive provides for a very circumscribed right to look for interface information through reverse analysis: only for certain purposes, uses, and under certain circumstances, may third party software writers undertake such actions. And even when falling within the ambit of the exception, software reverse engineering (interface research) involves very difficult processes and has rightly been described a “lengthy, costly and inefficient procedure.”¹⁶

The salient point is that interoperability primarily and mainly depends on the copyright-holder’s willingness. It is that player who will ultimately determine whether programs are interoperable. This is so, first, because it may decide to whom it will disclose relevant interface information and at what price;¹⁷ second, this is exacerbated by the fact that other software providers may only undertake reverse analysis provided they are the copyright holder’s licensees or authorised users; finally, even further disclosure to third parties is limited to achieving interoperability between the decompiler’s and the third party’s program.

Given the above, it appears legitimate to wonder whether there are legal tools through which the copyright holder may be forced to disclose interface information. The one that immediately comes to mind is competition law.

2.3 – Competition laws: Positive Duty to Disclose in “Exceptional Circumstances”

Competition law obviously also applies to undertakings providing software products or services. Through the application of Art.81 (preventing or remedying anti-competitive practices or agreements between firms) and the Merger Regulation ((MCR) prohibiting the creation or strengthening of dominant positions which would significantly impede competition) access obligations could be imposed. However, this article focuses on Art.82 (outlawing the abuse of a dominant position). That provision itself interacts with the Software Directive in a number of ways, but this article will only look at the issue of enabling third party interoperable software programs.¹⁸

Specifically, under what conditions can market players be forced to disclose relevant interface information by means of Art.82 EC Treaty? For that provision to apply, three conditions need to be fulfilled. First, one needs to prove the existence of a dominant position; second, there needs to be an anticompetitive abuse of that dominant position; finally, this should impact a substantial part of the common market.

¹⁶ See the Commission’s Explanatory Memorandum to the Software Directive, *O.J. C.91/7*, para.3.41; cited in S.Lai, *supra*, p.101.

¹⁷ It is not clear whether payment can be demanded for the provision of interface information. For opposing views, see Czarnota and Hart, *Legal Protection of Computer Programs in Europe – A Guide to the EC Directive* (1991), at p.80 (concluding that payment can be demanded) and Dreier, ‘The Council Directive of 14 May 1991 on the Legal Protection of Computer Programs’ [1991] 19 *EIPR* 319, at 324 (who seems to conclude that no payment can be demanded).

¹⁸ Indeed, other applications of Art.82 relate to (i) access to information for maintenance purposes; (ii) reproduction of existing *user* interfaces, namely those features enabling a user to interact with the program (e.g. scroll-down menu’s); or (iii) the dissemination of information in networks. See on these issues R. Downing, ‘Magill and the Software Directive: Are they Interoperable?’, *Web Journal of Current Legal Issues* (1995).

A. Dominance on the Relevant Market

The notion of dominance has been defined in the case law of the European Court of Justice (ECJ) as a position of economic strength affording an undertaking the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers.¹⁹ There are two steps for identifying dominance. First, it is necessary to delineate the relevant geographic and product/service market. Second, dominance is then assessed by reference to a number of criteria present on the relevant product/service and geographic market.

The objective of relevant market definitions is to identify actual and potential competitors of the undertakings that are capable of constraining their behaviour and of preventing them from behaving independently of an effective competitive pressure.²⁰ Demand side substitutability is the main tool for determining the relevant product/service market in a given case. The aim is to measure the extent to which consumers are prepared to substitute other products/services for the products/services in question.²¹ In contrast, supply side substitutability indicates whether suppliers other than those offering the product/service in question would switch in the immediate to short term their line of production or offer the relevant product/service without incurring significant additional costs.²²

The main test for determining this is commonly known as the 'SSNIP'; namely, what would be the effect of a small but significant non-transitory increase in price (e.g. 5-10%), assuming that the prices of all other products remain constant. The key issue is to determine whether the loss of sales would be sufficient to offset the increased profits resulting from the price increase. If the price increase is profitable for a given product/service, one can then add additional products/services or geographic areas depending on whether competition from those particular areas or products/services constrains the price of the product/service in question. This way, the scope of the relevant market can be more accurately determined.²³

The most critical indicators for determining whether undertakings enjoy a dominant position are the market share of the allegedly dominant undertakings, and the presence of significant barriers to entry. The latter provide an important insight into potential long term market power. Thus, legal provisions (e.g. IPRs or licensing restrictions),²⁴ technological advantage and know-how,²⁵ or vertical integration²⁶ have been included in the list of

¹⁹ Case 27/76, *United Brands v. Commission* [1978] ECR 207.

²⁰ See the Explanatory Memorandum to the Commission Recommendation 2003/311/EC of 11 February 2003 on Relevant Product and Service Markets within the Electronic Communications Sector Susceptible to Ex Ante Regulation, *supra*, p.7.

²¹ In *United Brands*, for instance, the ECJ accepted that banana's constituted a separate relevant market from other fruit sorts. The Commission had argued that this was the case because of their unique characteristics: 'appearance, taste, softness, seedlessness [and] easy handling.' The Commission furthermore pointed to the fact that the banana was a critical part of the diet of certain sections of the community such as the very young and the elderly. In sum, the banana was not a substitute of other fruit sorts.

²² In *Continental Can*, the ECJ annulled the Commission's decision on the basis that it had not properly considered if the producers of other types of can could enter the market for meat and fish cans. Case 6/72, *Continental Can v. Commission* [1973] ECR 215; referred to in B.J. Rodger, A. MacCulloch, *Competition Law and Policy in the European Community and United Kingdom*, (London, Cavendish, 2001), Second Edition, p.83. Note that 'short term' is to be intended as 'such period that does not entail a significant adjustment of existing tangible and intangible assets'. See Commission Notice on the Definition of Relevant Markets for the Purposes of Community Competition Law, *O.J. C.372*, para.20.

²³ See also *Commission Notice on the Application of the Competition Rules to Access Agreements in the Telecommunications Sector* ('Access Notice'), para.46; Case T-83/91, *Tetra Pak v. Commission*, [1994] ECR II-755, para.68.

²⁴ Case T-30/89, *Hilti AG v. Commission* [1991] ECR II-1439; Case 311/84, *Tele-Marketing v. CLT* [1985] ECR 3261.

²⁵ Case 85/76, *Hoffmann-La Roche v. Commission* [1979] ECR 461.

²⁶ Case 27/76, *United Brands v. Commission* [1978] ECR 207.

possible barriers to entry. Another clear barrier to entry is the control of access to facilities. A facility would be considered essential when access to it cannot be reasonably duplicated within an appropriate time frame either for legal reasons, or because it would cost too much.²⁷ This is because all of these can be used to control the way in which third party products reach the market.²⁸

In addition, dominance can also arise when no single firm is dominant. This is known as collective (or joint) dominance, and the inclusion of this type of dominance in the Art.82 analysis is made clear in the wording of the provision itself. Indeed, Art.82 states explicitly that 'any abuse by one *or more* undertakings of a dominant position' will be prohibited. In *Compagnie maritime belge* the Court held that it was well established that two or more economic entities legally independent of each other may hold a dominant position, provided that from an economic point of view they present themselves or act together on a particular market as a collective entity. Such interdependence may result from an agreement between parties, but also from other connecting factors and, in particular, from the structure of the market.²⁹ In sum, two conditions must be met: first, companies must have substantially the same position vis-à-vis customers and competitors as a dominant company;³⁰ second, there must be no competition between the two companies on the relevant market.³¹

In view of the above the following considerations are due as regards the issue of interface information. First of all, it should be borne in mind that whether or not the interfaces are protected by intellectual property rights (IPR) does not in itself influence the methodology employed for defining markets and finding dominance. However, by the same token IPRs may affect the concrete market definition itself in certain cases. Moreover, the general methodology needs to be reversed, as compared to other goods. In the case of interfaces, or potential bottleneck facilities, the emphasis tends to be on supply-side substitutability. The important question is how many competing goods may be successfully introduced within a short time span.

Cases which are useful in this regard are *Magill* and *Hugin*. *Magill* was about a refusal to supply copyrighted information on television programming for the creation of a new TV guide which would comprise all available programme information.³² The ECJ stated that, if a supplier is the sole source of information, the resultant *de facto* monopoly may amount to a dominant position if it gives the power to exclude others from the market.³³ The ability to obtain interface information under Article 6 of the Software Directive can hardly be called a second source. In addition, both the ECJ and the Commission have shown willingness to define narrow markets for products which are supplied subsequently to work with a primary product. The classic example is spare parts. In *Hugin v Commission*, the ECJ upheld a finding of dominance in the supply of spare parts despite the fact that Hugin held a small

²⁷ See *Access Notice*, para.74.

²⁸ B.J. Rodger, A. MacCulloch, *Competition Law and Policy in the European Community and United Kingdom*, (London, Cavendish, 2001), Second Edition, pp.87-88.

²⁹ Joined Cases C-395/96 P and C-396/96 P, *Compagnie maritime belge and others v. Commission* [2000] ECR I-1365, paras.36 and 45. See also the court of first instance (CFI) which confirmed that no economic links are needed for finding collective dominance. Case T-102/96, *Gencor v. Commission* [1999] ECR II-753.

³⁰ This appears to require larger combined market shares than would be needed for a single dominant position: See G. Monti, 'The Scope of Collective Dominance under Article 82 EC.', 38 *Common Market Law Review* (2001), p.153.

³¹ Commission Notice on the Application of the Competition Rules to Access Agreements in the Telecommunications Sector (the *Access Notice*), O.J. C.265, para.79. See for further academic literature on this topic: R. Whish, *Competition Law* (London, Butterworths, 2001 – fourth edition).

³² Joined Cases C-241/91 P and C-242/91 P, *RTE and ITP v. Commission (Magill)* [1995] ECR I-743 (note that *Magill* is a critical decision as it comprises a Commission Decision in favour of granting a licence; an order of the President of the ECJ (against); a Judgment of five judges of the CFI (for); an AG opinion (against); and finally a full bench of the ECJ (for)).

³³ Joined Cases C-241/91 P and C-242/91 P, *RTE and ITP v. Commission (Magill)* [1995] ECR I-743.

share of the market for the primary product.³⁴ In the case of interface information, this could mean that there may well be a dominant position on the market for interoperable software, even though the market share for the target software is small.³⁵

B. Abuse

A given market definition is not an end in itself, but a means to assessing effective competition or dominance. Dominance in itself is not illicit. In contrast, the law prohibits any market player to abuse its dominant position. Dominant companies have a 'special responsibility' towards competitors, suppliers and customers, because of their strong position on the market. They should not engage in conduct that might otherwise be permissible for non-dominant firms.³⁶ In essence, any conduct that seriously distorts competition on a given relevant market would be prohibited if it affects trade between MS.

There are essentially two main forms of abusive behaviour, though the boundary between them is not necessarily crystal clear. The first concern is that dominant firms might be in a position to maximise profits (or exploit their market power) by reducing output and increasing the price of the product/service above a competitive level. Examples include excessive pricing,³⁷ unfair conditions,³⁸ and even the refusal to innovate.³⁹ The second (and often related) form of abusive conduct is exclusionary in effect; that is, dominant firms might abuse their market power by excluding rivals. The most famous example is the refusal to grant access to an essential facility.

(i) At the core of Art.82 lies the right to non-discrimination, or 'applying dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage.' Discrimination may be found in relation to prices offered and/or quality of service (e.g. providing update information about technical interfaces). Two situations can be distinguished. First, a dominant provider may discriminate as between two third parties; second, the (vertically integrated) dominant firm might want to favour its own subsidiary by providing the product/service to it at a better price/quality. Both cases are *prima facie* anti-competitive. Obviously, there is no discrimination if an objective justification can be advanced for the differing treatment.

(ii) As concerns pricing abuses, there has surprisingly only been one case in which the Commission held that a firm was abusing its dominant position through excessive fees. Moreover, that decision was subsequently annulled by the ECJ. The ECJ proceeded to agree in passing that charging excessive prices constituted an abuse, but failed to provide further indications as to what constituted evidence of excessive pricing.⁴⁰ It appears that some inquiry into the costs of production is likely to be necessary in excessive pricing cases. With few exceptions, these costs are difficult to determine. In any event, competition authorities are usually faced with the lack of precise information needed for this type of

³⁴ Case 22/78, *Hugin v. Commission* [1978] ECR 1869.

³⁵ See R. Downing, *supra*.

³⁶ Dominant firms have a special responsibility not to allow their conduct to impair undistorted competition. Case 322/81, *Michelin v. Commission* [1983] ECR 3461, para.10; cited in B.J. Rødger, A. MacCulloch, *Competition Law and Policy in the European Community and United Kingdom*, (London, Cavendish, 2001), second edition, pp.89-90.

³⁷ Case 26/75, *General Motors v. Commission* [1975] ECR 1376.

³⁸ Case 127/73, *BRT v. SABAM* [1974] ECR 313. In the latter case, a performing rights society was held to have abused its dominant position by imposing on its members obligations which were not strictly necessary for attaining its object.

³⁹ Case C-179/90, *Merci Convenzionali Porto di Genova v. Siderurgica Gabrielli* [1991] ECR I-5889. In this case, the refusal to introduce faster and modern technology for unloading operations was considered an abuse of a dominant position, insofar as the result was that operations took more time and were therefore more expensive.

⁴⁰ Commission Decision 76/353, *Chiquita* [1976] O.J. L.95/1; Case 27/76, *United Brands v. Commission* [1978] ECR 207.

assessment, and generally reluctant to engage into it. In fact, this is logical: it would be rather drastic for the Court to impose on market players its own opinion as to what might constitute a fair price, or a price which bears no economic relation to the economic value of the good supplied.

The situation as regards pricing practices is even more complex in vertical settings, such as the one which forms the object of the present article. First of all, predation could be achieved through what is termed 'cross subsidisation'.⁴¹ More specifically, this situation arises when a market player subsidises one activity (say, downstream) by allocating the costs incurred on that market to its activity in another product/service market (say, upstream) – i.e. charging its subsidiary low access prices. As a general rule, there is nothing wrong with this type of market behaviour, since the firm puts its well-running business (here, upstream) at risk. In contrast, if the firm is dominant in the (upstream) market, cross-subsidisation will be anti-competitive since it can be used in a predatory manner to drive out competition on the downstream market. First, the upstream firm could sell at a loss to its downstream competitor. This is however not going to occur very often, in view of the non-discrimination obligation of Art.82.⁴² Second, and more plausible in view of the above, is the 'price squeeze' situation. Here, the upstream firm sells to both its subsidiary and the competitor for the same non-discriminatory *high* price. Thus it makes large profits in this market. If its subsidiary then does very low and aggressive pricing in the downstream market, it will squeeze the competitor out of the market.⁴³ Arguably, no all too excessive price is necessary for squeezing out competitors this way.

(iii) Undertakings may not leverage the market power they enjoy on one market to a related market, as they could otherwise behave independently of their customers on the latter market.⁴⁴ The *Tetrapak II* judgment concerned horizontally related markets but the same no doubt applies to vertical markets as well. It is to be noted that the ECJ was careful to confine the finding of abuse to 'special circumstances'; namely where two markets are linked.⁴⁵ This will be the case where the related market concerns an ancillary, complementary or dependent activity;⁴⁶ where the related market is a sub-market of the dominated market;⁴⁷ and where the dominant firms equally has a leading position in the related market, and the (potential) customers of the dominant firm also depend on the latter in that market. In fact, such situations will often arise in software markets. One method for leveraging market power to other markets is through tying or bundling.⁴⁸

⁴¹ Predatory pricing takes place when a dominant firm abuses its market power by selling a good below cost for a long period of time with the intention of eliminating or weakening competitors or deterring market entry. Some economists have doubted the likelihood of predation, as recouping such losses would be impossible or implausible. For an overview of the range of opinions among economists, see G. Abbamonte, 'Cross-Subsidization and Community Competition Rules', 23 *European Law Review* 414, at pp.424-25.

⁴² Indeed, if it sells at a loss to its own subsidiary, it will need to set the same price when selling to third party competitors. P. Larouche, *Competition Law and Regulation in European Telecommunications*, p.235.

⁴³ P. Larouche, *supra*, pp.235-239.

⁴⁴ See also Case COMP/M.2146 – *Tetra Laval/Sidel*, paras.325-389.

⁴⁵ Case G333/94 P, *Tetrapak International SA v Commission* [1996] ECR I5951, at p.6008; S. Farr, V. Oakley, *EU Communications Law*, (Bembridge, Palladian Law Publishing, 2002), p.31.

⁴⁶ Case 6-7/73, *Commercial Solvents v. Commission* [1974] ECR 223; Case 311/84, *CBEM v. CLT & IPB (Telemarketing)* [1985] ECR 3261; Commission Decision 98/190, *Flughafen Frankfurt/Main* [1998] O.J. L.72/30.

⁴⁷ Case 62/86, *AKZO v. Commission* [1991] ECR I3359; Cases C-241-242/91P, *RTE & ITP (Magill)*, [1995] ECR I-743.

⁴⁸ Art.82(d) hints to this type of anti-competitive abuse when it makes illegal 'the conclusion of contracts subject to the acceptance by the other parties of supplementary obligations, by their nature or according to commercial usage, have no connection with the subject of the contracts. Indeed, suppose a company has a monopoly over A and sells B in a competitive market. By bundling products A and B – e.g. people who buy A get B for free – competing producers of B are driven out of business. The leading case here is *Hilti* in which three different market were identified – nail guns, cartridge strips and nails – and the dominant undertaking

(iv) Finally, and most importantly, absent objective justification dominant undertakings may not refuse to supply market players which are dependent on them.⁴⁹ This is particularly so when this would result in eliminating third parties from competing with itself, or with an undertaking belonging to the same group.⁵⁰ In *Commercial Solvents*, for instance, the dominant undertaking was required to resume supplies to the complainant company, of raw materials for the production of pharmaceuticals. The dominant firms had decided not to supply the latter following its decision to enter the market for the production of the pharmaceutical in question. The ECJ upheld the decision of the Commission that a refusal to supply a firm which cannot easily obtain the good elsewhere amounted to abuse of a dominant position. This was *a fortiori* the case where the buyer had previously been a regular customer.⁵¹ Finally, it applies not only to initial supplies, but equally to spare parts (e.g. software updates).⁵²

A related category of abuses is the 'essential facilities' doctrine. Essential facilities have been defined as a facility or infrastructure which is essential for reaching customers and/or enabling competitors to carry on their business, and which cannot be replicated by any reasonable means.⁵³ Thus, in certain cases a dominant undertaking must not merely refrain from anti-competitive action but must actively promote competition by allowing potential competitors access to the facilities which it has developed.⁵⁴ However, although the Commission has expressly endorsed it,⁵⁵ the ECJ and Court of First Instance (CFI) appear more reluctant to do so.⁵⁶ As regards IPR, the general rule is that a refusal to supply cannot *in itself* constitute an abuse. In *Volvo*, the car manufacturer instituted proceedings against the defendant for infringing its registered design on replacement parts for its cars. In that case the court recognised that exclusivity was the essence or substance of the design right. It was not an abuse of a dominant position for a car manufacturer holding the registered design for body panels for its cars to refuse to license others to supply

was held to have abused its dominant position by tying the sale of the nail guns with the cartridge strips (Case C-53/92 P, *Hilti AG v. Commission* [1994] ECR I-667). It is to be noted that tying can be achieved not only by contractual, but also by technological means (to date, the only EU case on technological tying was Case 60/81, *IBM v. Commission* [1981] ECR 2639. See the 14th Report on Competition Policy, 1984, paras.94-95. Cf. *Infra*). Sometimes tying practices may be justified having regard to technical considerations, or if they are supplied together by nature or custom.

⁴⁹ Examples of objective justifications include a genuine shortage – in which case the firm may supply its loyal customers first: Case 77/77, *BP v. Commission* [1978] ECR 1513; knowledge that the buyer is unlikely to pay or would take a long time to effectuate the payment: R. Lane, *EC Competition Law* (Harlow, Pearson Education, 2000), p.159.

⁵⁰ See *inter alia* Case 311/84, *CBEM v. CLT & IPB (Telemarketing)* [1985] ECR 3261, at 3278; Case 18/88, *RTT v. GB-Inno-BM* [1991] ECR I-5941, at 5979-5980.

⁵¹ Cases 67/73, *Commercial Solvents v. Commission* [1974] ECR 223, para.25. Obviously, the orders in question must not be out of the ordinary. See Case 27/76, *United Brands*, at p.292.

⁵² Case 22/78, *Hugin Kassaregister AB v. Commission* [1979] 3 CMLR 345.

⁵³ H. Ungerer, 'Access Issues Under EU Regulation and Antitrust Law. The Case of Telecommunications and Internet Markets', *International Journal of Communications Law and Policy*, 2000, p.25 – available at http://www.ijclp.org/5_2000/pdf/ijclp_webdoc_4_5_2000.pdf.

⁵⁴ This doctrine has been imported from the United States. See among others *US v. Terminal Railroad Association*, [1912] 224 US 383; *MCI Communications Corporation v. American Telephone and Telegraph Company*, [1983] 708 F.2d 1081. See the opinion of AG Jacobs in Case C-7/97, *Oscar Bronner v. Mediaprint* [1998] ECR I-7791, paras.45-47.

⁵⁵ Commission Decision of 11 June 1992, *B&I Line/Sealink Harbours & Stena Sealink (Sealink I)*, [1992] 5 CMLR 255; Commission Decision 94/19, *Sea Containers/Stena Sealink (Sealink II)*, [1994] O.J. L.15/8; Commission Decision 94/119, *Rødby Port*, [1994] O.J. L.55/52; Commission Decision of 16 May 1995, *Irish Continental/CCI Morlaix*, not published.

⁵⁶ See the recognition of this belief in the recent Commission Decision COMP D3/38.044 - *NDC Health/IMS Health*, OJ [2002] L59/18, at para.64, and the opinion of AG Jacobs in *Bronner*, at para.35.

replacement panels necessary for the repair of the cars, even in return for a reasonable fee.⁵⁷ This point was reiterated in the subsequent *Magill* case, where the ECJ declared that refusal to grant a copyright licence cannot in itself constitute abuse of a dominant position, even when it is the act of a dominant undertaking.⁵⁸ At first sight, this appears to be a logical corollary to the exclusive right which was granted in the first place.

However, the particular *exercise* of an exclusive right or IPR by the proprietor may be prohibited by Art.82 in certain cases. (a) In *Volvo* the ECJ stated that Art.82 may apply, for instance, if the exercise of a car manufacturer involves on the part of the dominant undertaking certain abusive conduct, such as the arbitrary refusal to supply, price fixing at an unfair level, or a decision no longer to produce spare parts for a model which is still in circulation.⁵⁹ Thus, additional abusive conduct was required on the part of the IPR holder for there to be an abuse in the sense of Art.82. (b) In *Magill* the ECJ expanded the above. It upheld the judgment of the CFI, and ruled that ‘exceptional circumstances’ were present, which rendered the refusal to supply the copyrighted TV information an abuse of a dominant position. In particular, the appellants’ refusal to supply copyrighted information prevented the appearance of a new product, a comprehensive weekly guide to TV programmes, for which there was a potential consumer demand. Moreover, this refusal could not be objectively justified, and was likely to eliminate all competition in the market for TV guides.⁶⁰ In sum, evidence of exceptional circumstances was required, in addition to the lack of objective justification and the likelihood that competition would be eliminated on the secondary market – the list of such ‘exceptional circumstances’ was open-ended.

Two subsequent cases further qualified the position of the ECJ. (c) In *Ladbroke*, applicant sought to obtain the right to retransmit copyrighted pictures and sound commentaries, on the basis that otherwise it could not compete on the betting market. In particular, it argued that the refusal to supply it with the right in question constituted an abuse of a dominant position. The court rejected the claim on the basis that ‘the refusal to supply the applicant could not fall within the prohibition laid down by Art.[82] unless it concerned a product or service which was either essential for the exercise of the activity in question, in that there was no real or potential substitute; or was a new product whose introduction might be prevented, despite specific, constant and regular potential demand on the part of the consumers.’⁶¹ (d) Finally, in *Oscar Bronner* a large Austrian newspaper group refused to include another newspaper publisher in its national home-delivery service. The Court stressed that ‘*even if* that case law on the exercise of the intellectual property right were applicable to the exercise of any property right whatever, it would still be necessary for the *Magill* judgment to be relied upon (...) in a situation such as that [in *Bronner*]’ to prove that a number of conditions are satisfied.⁶² The conditions laid down by the ECJ were themselves rather stringent; namely that (i) the refusal to deal was likely to

⁵⁷ Case 238/87, *Volvo v. Veng* [1988] ECR 6211 at paras.8-9. See equally, Case 53/87, *CICRA v. Renault* [1988] ECR 6039, para.10.

⁵⁸ Joined Cases C241/91 P and C242/91 P, *RTE and ITP v. Commission (Magill)* [1995] ECR I743, at para.49. For the facts of the *Magill* case, see further.

⁵⁹ See Case 238/87, *Volvo v. Veng* [1988] ECR 6211 at paras.8-9.

⁶⁰ See especially paras.52-56. Although the low value of the IPR in question was not expressly mentioned in the decision as an exceptional circumstance, some authors believe that this is the key to properly understanding the court’s ruling. More specifically, the UK and Ireland are the only countries where programme listings, without any creative value nor secrecy, are copyright protected. See I.S. Forrester, ‘*EC Competition Law as a Limitation on the Use of IP Rights in Europe: Is there Reason to Panic?*’, Eighth Annual EU Competition Law and Policy Workshop (2003), at p.7; see also the opinion of AG Jacobs in *Bronner*, at para.63: “the provision of copyright protection for programme listings was difficult to justify in terms of rewarding or providing an incentive for creative effort.” See also Case T-198/98, *Micro Leader Business v. Commission* [1999] ECR II-3989, para.56.

⁶¹ Case T-504/93, *Tiercé Ladbroke SA v. Commission* [1997] ECR II-0923, see para.131.

⁶² Case C-7/97, *Oscar Bronner* [1998] ECR I-7791, para.41 (emphasis added).

eliminate all competition in the downstream market, (ii) could not be objectively justified and (iii) the facility should be indispensable inasmuch as there is no actual or potential substitute in existence. The first two conditions can be found in earlier cases on refusals to supply (e.g. *Telemarketing*, *GB-Inno-BM*), the third condition is the most stringent one and comes from *Ladbroke*, itself a CFI case concerning IPRs.⁶³ The key elements of the third criterion are thus that access is genuinely indispensable; it is not possible practically to replicate the facility, even for an undertaking of the same size and resources as the holder of the facility.⁶⁴ The bottom line is thus that access to IPRs by means of the essential facilities doctrine is possible but on very stringent conditions indeed.⁶⁵

C. Substantial Part of the Common Market

The last condition for the application of Art.82 is that the dominant position must relate to a substantial part of the common market. With the enlargement of the EU, it may no doubt be argued that a single MS does not constitute a substantial part of the common market. On the other hand, areas of MS can be considered a substantial part.⁶⁶ Most critically, the Commission has made clear in relation to access to an airport facility that ‘it is important to stress that a port, an airport or any other facility, even if it is not itself a substantial part of the common market, may be considered as such in so far as reasonable access to the facility is indispensable for the exploitation of a transport route which is substantial.’⁶⁷ By analogy, bottleneck facilities in the software value chain – such as essential interfaces – may thus be held to be substantial parts (for the application of Art.82) if these are indispensable for the provision of DTV services in a substantial part of the common market.

2.4 – Conclusion

In brief, the picture thus looks as follows: the Software Directive and implementing laws introduced software copyrights, and impose a mere negative duty on those copyright holders not to oppose actions of competitors (e.g. reverse engineering) aiming at achieving interoperability; but only if certain conditions are fulfilled. Namely, third party software providers can only do so for certain well-defined *purposes* (obtaining interoperable

⁶³ Cf. *supra*

⁶⁴ Case C-7/97, *Oscar Bronner* [1998] ECR I-7791, para.44; opinion AG Jacobs, paras.65-66. See moreover discussion in M. Furse, *supra*, p.260.

⁶⁵ The *IMS Health* case is the latest important decision in this respect. It is the first time that the *Magill-Bronner* doctrine was applied by the Commission in relation to IPR protection. IMS is the world leader in gathering and supplying data on deliveries to pharmacies by wholesalers of pharmaceuticals. Pharmaceutical companies use these data to measure the effectiveness of their promotional efforts in each town and district. The geographic format used by IMS, which divides Germany in 1860 zones, had become the *de facto* standard for the industry. In other words, in order to enter the market, companies needed to be able to use the IMS format. However, IMS relied on copyright to prevent competitors from entering the market. The Commission found that IMS’s claim for copyright infringement constituted an abuse of a dominant position, as it eliminated competition and lacked objective justification. In consequence, it ordered IMS to grant access (in the form of a copyright licence) to all undertakings currently present on the market for German regional sales data. Case COMP.D3/38.044 – *NDC Health/IMS Health: interim measures*, O.J. L.59/18 [2002]. As the CFI considers that serious legal questions were raised which merit full consideration, it has decided to stay the execution of the Commission Decision until such time as the CFI has delivered its judgment on the merits. See Case T-184/01 R, *IMS Health Inc. v. Commission*, 26 October 2001, paras.78-81 and para.105.

⁶⁶ See Cases 40-48, 50, 54-56, 111, 113-114/73, *Coöperatieve Vereniging Suiker Unie v. Commission*, [1976] 1 CMLR 295, at para.448, where the ECJ held that the Southern part of Germany constituted a substantial part of the common market, having regard to the pattern and volume of production and consumption as well as the habits and economic opportunities of vendors and purchasers.

⁶⁷ Commission Decision of 11 June 1992, *B&I Line/Sealink Harbours & Stena Sealink (Sealink I)*, not published. See 22nd Annual Report on Competition Policy (1992), point 219; cited in M. Furse, *Competition Law of the UK and EC*, (Oxford, Oxford University Press, 2002 – third edition), p.258.

products), given specific *circumstances* (indispensability; unavailability; being a licensee or authorised person; confined to the interface) and for narrowly defined *uses* (interoperability, even when it is about disclosing the information to others). In addition, it may be that only the reproduction of short segments of the actual code or 'expression' will suffice to achieve interoperability. Thus, software regulation places a heavy burden on competing or third party software providers, and possibly enable copyright holders to charge excessively high prices for releasing interface information. Considering the inherent difficulty of either yielding interface information or proving that those pieces of code are not copyright protected, one may need other legal means to obtain interoperability.

Competition laws are the most obvious means. In fact, Recital 27 of the Software Directive expressly states that its provisions are without prejudice to the application of the competition rules. Thus, Art.82 might be used for a range of purposes. The thread through the latter provision is the non-discrimination principle. In principle, it may be used to prevent not only outright refusals to supply interface information or access to facilities deemed to be 'essential', but equally against discriminatory practices, anti-competitive pricing, or leveraging of market power by means of interface information control. Importantly, the competition law provisions are not confined to interface information, and *Magill* evidences that even proprietary information may be the object of a compulsory licencing obligation.

However, upon closer examination, it appears that eventually Art.82 might not provide third party software providers with such a strong tool for achieving software interoperability. Although the case law indicates that the ECJ might not be that reluctant to find dominance, intricate issues arise at the stage of proving abusive or anti-competitive behaviour. In case of refusals to supply the latest position is that, even if the previous case law on the exercise of the IPR were applicable (i.e. *Magill*), it would still be necessary to prove that (i) the refusal to deal was likely to eliminate all competition in the downstream market, (ii) could not be objectively justified and (iii) that there is no actual or potential substitute in existence. Access should be genuinely indispensable, and it should not be possible practically to replicate the facility, even for an undertaking of the same size and resources as the holder of the facility.

In fact, third parties are slightly better off when they previously had access to the software interfaces, or when other third party providers are granted that software interface information. This is because Art.82 then proves more cogent a tool against refusals to supply or discriminatory practices. If there was no previous access, then it may be hard to prove that the copyright holder is charging anti-competitive prices. First, the difficulty of proving excessive pricing is widely known – the only case to date in which the Commission made such an argument was quashed by the court. Prices would need to be completely out of tune with reality for the court to intervene. Second, pricing abuses in a vertical setting (i.e. where the software provider is active at both levels around the interface – which is usually the case) are even harder to prove. Though cross-subsidisation (by means of excessively low prices) is not realistic in view of the non-discrimination obligation, 'price-squeezing' (by means of high interface access prices and low to break-even prices in the second market) is a possibility and arguably may not require all too excessively high prices to be a successful strategy.

Unfortunately, there is no Art.82-type case law in relation to software, and it may be hard to second-guess the actual position of the Commission on this particular issue. In *IBM*, the only such case, the Commission had taken a preliminary view that IBM was abusing its dominant position in the data processing (hardware) market by, in part, refusing to supply sufficient technical information to its competitors for them to be able to compete in the

associated market for interconnected (software) products/services.⁶⁸ By means of the IBM Undertaking, the latter firm agreed to supply the necessary interface information.⁶⁹ This case formed the immediate basis for Art.6 of the Software Directive. Crucially, though this is the only actual Commission decision on this issue, it dates from 1981 and might thus have little relevance in the present fast-evolving software environment.

III. Criticising the Underlying Assumptions of Current Software Regulation

3.1 – Introduction

The previous part discussed the regulation of software. In the present part, the underlying assumptions of that regulatory model are criticised. More particularly, these are (3.2) that generally market players will *not* refuse to disclose interface information to third parties. The latter view is based primarily on classic economic literature regarding vertical restraints and network effects. Conversely, the law presupposes (3.3) that, if needed (i.e. in exceptional circumstances), dominant players can be easily discerned and adequately compelled to disclose software interface information by means of classic competition law methods, should they refuse to do so. The above-depicted legal construction is thought to strike the ultimate balance between inducing investments through the recognition of property rights (in information), and granting third parties access in order to enable society at large to benefit from that innovation. Seen this way, both sides of the token depend on each other; failing one of the two assumptions the whole construction collapses irremediably. This part concludes exactly this: the axioms underpinning European software interoperability provisions are not so clearly warranted in practice, given the characteristics of software products/services.

3.2 – Software Interoperability and Public Interest Regulation: New Perspectives

A. Vertical Restraints and Vertical Integration

Abuse of bottleneck facilities only makes sense where the controller is active at both levels, as in the absence of vertical integration there would be little commercial justification for dissuading entry of competitors. The reason is that there would otherwise be no gains downstream to offset lost profits upstream.⁷⁰ It is therefore important to understand the benefits and dangers resulting from vertical relationships, and confront these with the benefits of horizontal DTV markets.

Advantages – On the one hand, there are clear user benefits flowing from vertical restraints, of which the most extreme form is vertical integration. Specifically, economic theory focuses on two points: (i) double marginalisation and (ii) free riding.

⁶⁸ Case 60/81, *IBM v. Commission* [1981] ECR 2639; see R. Lane, *EC Competition Law*, (Harlow, Pearson Education, 2000), p.156. See also Opinion of AG Jacobs in *Bronner*, para.44. Specifically, three matters were of concern: (i) the combination of main memory storage and an operating system (OS) with System/370; (ii) refusing to supply manufacturers of plug compatible equipment with the interface information for manufacturing their equipment; and (iii) refusing to supply software installation services to users of non-IBM computers. See S. Lai, *The Copyright Protection of Computer Software in the United Kingdom*. (Oxford, Hart Publishing, 2000), pp.8-9, footnote 66.

⁶⁹ Undertaking given by IBM, *Bull EC* 10-1984, pp.96-103.

⁷⁰ C. Cowie, C.T. Marsden, 'Convergence, Competition and Regulation', *International Journal of Communications Law and Policy*, 1998 (IJCLP), p.6; available at http://www.digital-law.net/IJCLP/1_1998/ijclp_webdoc_6_1_1998.html.

(i) First of all, vertical restraints are recognised to remove existing market inefficiency arising from ‘double marginalisation’.⁷¹ Double marginalisation refers to the situation where two players which operate at different levels of the value chain enjoy a certain market power (i.e. the markets are not perfectly competitive). The price they will charge will eventually be relatively high, because both players seek to maximise profits and both choose a mark-up (margin) over their own costs. However, in putting its own price at the level where marginal cost equals marginal revenue, the firms fail to take into account the effect that their pricing has on the firm at another level of the value chain. Thus, the pricing behaviour of vertically separated entities gives rise to a negative externality. In sum, users pay too high a price and both firms are punished for this because sales are less than optimal.

If both firms however enter into agreements with each other, they might prevent the double marginalisation problem. Both firms can then co-ordinate their behaviour so as to ‘internalise’ the (vertical) externality. In doing so, the upstream and downstream firms achieve the optimal level of production, which then maximises the overall profits. The result is that both users and firms gain from the vertical restraints they impose on each other (or from a vertical merger).⁷² At the same time, greater co-ordination between the various players oftentimes leads to better product design and production.

(ii) Secondly, vertical restraints (or vertical integration) restore incentives to invest in services. In the absence of vertical agreements, there might be a free riding problem; namely, that no single firm is prepared to put time and effort in promoting particular goods (e.g. through advertisements or services) because other players at the same level of the value chain might profit of its efforts while charging lower prices.⁷³

Vertical restraints (e.g. exclusivity contracts) or vertical mergers are likely to solve that problem. The restraint keeps free riders away. As a result, vertical restraints may be pro-competitive by promoting a particular brand and so stimulate inter-brand competition.

Disadvantages – On the other hand, it is now recognised that vertical restraints are not always pro-competitive, and vertical mergers should certainly not be left totally unscrutinised. The reasons are three-fold. First, foreclosure; second, higher prices; and third, facilitating anti-competitive strategic (or collusive) behaviour. This text focuses on the first of these since it is related to the research question of the paper: under which economic conditions will software copyright holders prevent software interoperability through market foreclosure? The other two grounds are briefly referred to in footnote because they are less important in the present context.⁷⁴

⁷¹ Vertical restraints are contracts between market players at different levels of the value chain, by which one player limits the choice of the other player, in order to obtain a better result for itself. Examples include resale price maintenance (e.g. deciding on the price at which the product should be sold), quantity fixing, and exclusivity clauses (e.g. territorial exclusivity, exclusive dealing or selective distribution).

⁷² G.B. Abbamonte, V. Rabassa, ‘Foreclosure and Vertical Mergers - The Commission's Review of Vertical Effects in the Last Wave of Media and Internet Mergers: AOL/Time Warner, Vivendi/Seagram, MCI Worldcom/Sprint.’, *European Competition Law Review* (2001), p.214. Another positive effect of a vertical merger is that the merged firm will price its input at marginal cost. If the price was higher than marginal cost, the merger will therefore force the input firm to increase its output and reduce its price to marginal cost. M.H. Riordan, S.C. Salop, ‘Evaluating Vertical Mergers: A Post-Chicago Approach.’, 63 *Antitrust Law Journal* (1995), p.525.

⁷³ Note that free riding by producers is also a possibility. If producer A invests time and effort in improving the service offered by the retailer, other producers might also free ride on this better service at the retail level, without incurring the cost of producer A. The result might be that A does not invest. Again, vertical restraints such as exclusivity clauses might be welfare enhancing in this case.

⁷⁴ Specifically, (i) Vertical restraints are the classic market mechanisms used to solve the commitment problem. In other words, firms at other stages of the market will not want to contract with the owner of the product, for fear that their competitors will get a better deal. Full exploitation of the monopoly position is thus prevented, unless the firm gets round the problem by means of vertical integration. The search for

As concerns foreclosure, some authors have suggested that firms engage in exclusive contracts (or vertical mergers) in order to monopolise adjacent markets. Hence, a monopolist upstream firm would conclude exclusive agreements with a retailer in order to keep out rival wholesalers (or potential entrants). At the same time, it would be able to extend its monopoly power to the downstream market. The point was that one should be wary of vertical restraints or vertical integration when there is significant market power. There was a debate as to whether these arguments are conclusive:

Proponents of the Chicago School argued that vertical restraints are pro-competitive for two reasons. First, they contended that vertical restraints will not effect the rivals' supply of input. This is because a buyer would not normally be willing to conclude an exclusive agreement with a (less efficient) monopolist, if there is a more efficient (upstream) potential entrant or rival.⁷⁵ And even if this were the case, the mere fact that a vertical merger excludes rivals' access to input supply does not mean that the total supply has been closed off. Instead, rivals are likely to gain access to the supply of firms that previously supplied the merging firm's downstream business. Thus, this merely means that supply patterns are being reshaped as a result of the vertical merger.

Second, they suggested that in any case the monopolist has no interest in leveraging its monopoly power to the adjacent (downstream or upstream) market. This is because all the monopoly profits can already be incurred upstream.⁷⁶ Indeed, the monopolist can already extract the "single monopoly profits" in its own market, irrespective of whether there is a vertical restraint or merger. *A contrario*, if it decides to integrate vertically, this means that there must be some efficiency gain, from which users also benefit. Instead of enhancing monopoly power, the only economic motive for vertical integration is to reduce costs by achieving synergies. In sum, it was argued that "[t]he foreclosure theory is not merely wrong, it is irrelevant."⁷⁷

However, recent literature indicates that there are circumstances where vertical mergers or restraints are nonetheless anti-competitive. This is because they generate foreclosure or exclusionary effects.⁷⁸ The findings are based on new economic models: game theory and strategic behaviour. The main point here is that the monopolist seeking to exclude (or foreclose) rivals by exclusive contracts might want to do so with a view to increasing profits on adjacent markets. In other words, vertical integration modifies the incentives of the merged entity in its dealings with competitors both upstream and downstream. In setting prices to unaffiliated companies the integrated company will take into account the impact of competition on its integrated business. It therefore appears that vertical restraints might induce the exercise of monopoly power through input and/or customer foreclosure. This might affect rivals even when they are not totally foreclosed from the market, *inter alia* by raising their costs or by degrading the quality of the services they receive.

commitment on the part of the seller may lead to *higher prices*. This is because the firms may commit to fixing industry wide price, which is called resale price maintenance. M. Cave, *The Commission's Proposals for the Treatment of Significant Market Power*, Discussion Paper commissioned by the BBC, Annex 2, p.11; M. Motta, *Competition Policy. Theory and Practice*. (Cambridge, Cambridge University Press, 2003), p.248

(ii) Vertical restraints may furthermore lead to *strategic or collusive behaviour* in a context of inter-brand competition. The idea is that the wholesaler could use its retailer to induce strategic behaviour of competitors. For instance, it could charge high wholesale prices, thus forcing the retailer to also raise its prices; the profit could then be paid back to the wholesaler via a fixed franchise fee. Competitors might behave strategically and also raise their retail prices, resulting in a general welfare loss. For a good overview of the arguments, see M.H. Morse, 'Vertical Mergers: Recent Learning.', 53 *Business Lawyer* (1998), p.1227 ff.

⁷⁵ The Chicago School approach is based on an assumption that barriers to entry are generally low.

⁷⁶ Note that as the adjacent market is perfectly competitive there is no problem of double marginalisation.

⁷⁷ R.H. Bork, *The Antitrust Paradox: A Policy At War With Itself*. (New York, Basic Books, 1978), p.237.

⁷⁸ See for instance T. Krattenmaker, S.C. Salop, *Anti-competitive Exclusion: Raising Rivals' Costs to Achieve Power over Price.*, (1986) *Yale Law Journal*, pp.209-293; M.H. Riordan, S.C. Salop, 'Evaluating Vertical Mergers: A Post-Chicago Approach.', 63 *Antitrust Law Journal* (1995), pp.513-564.

It appears that the most critical factor in this respect is the amount of market power. In the absence of upstream rivals, a vertical merger would be hugely detrimental since the upstream monopolist would then have incentives to foreclose downstream rivals completely. The price would then rise to monopoly level. However, when less efficient upstream rivals exist, the price would equally be raised, but less. This is because the upstream part of the vertically integrated firm would then supply the downstream rivals. Since they would obtain the product anyhow, it is better to provide them with it than to let them be served by the upstream competitor.⁷⁹ Hence, the more (upstream and/or downstream) market power there is, the more detrimental vertical restraints are for competition.

Conclusion – In sum, vertical restraints have clear pro-competitive effects. If the markets are not perfectly competitive, these are mechanisms to solve the so-called double marginalisation problem, and allow for greater co-ordination, resulting in lower prices for the end-user. Secondly, vertical restraints potentially remove inertia of market players, caused by possible free riding of competitors. As a result, products are marketed and advertised where without vertical restraints this might not have been the case.

Nonetheless, one should not leave vertical restraints and vertical mergers unscrutinised. This is because economic theory suggests that there may be potential foreclosure (or exclusionary) effects associated with them (in particular with vertical mergers). In addition, vertical restraints might have the effect of raising price levels, and facilitating collusive or strategic anti-competitive behaviour between firms at various levels of the vertical chain. Crucially however, only restraints or mergers involving firms with enough (upstream and/or downstream) market power appear to raise substantial welfare reduction issues.

Some authors applied the above reasonings to the software market.⁸⁰ Indeed, vertical restraints or the vertical integration of software might prevent double marginalisation and allow for greater co-ordination, thus resulting in lower prices for end-users. In addition, it might remove the fear that other market players free ride. Third party software providers which are only present at one level of the value chain would not easily engage in the promotion of their products since there would be a fear that other third party or competing market players (at the same stage of the value chain) free ride on their investments. In contrast, vertically integrated players (or software providers imposing vertical restraints on each other) do not have this fear: thanks to the restraint they can invest in marketing the software good/service for their own interest. However, in the presence of large market shares, vertical integration (or restraints) might be used to foreclose competitors' entry at either level of the market, or at least to raise rivals' costs. Thus vertical restraints can facilitate anti-competitive behaviour.

B. Direct and Indirect Network Effects

An analysis on software market would not be complete without having regard to network effects. Indeed, software goods/services are characterised by the existence of pervasive network effects. Network effects are present when the value of the good increases with each additional person using it. The classic example is the telephone network. If one person has a telephone, the value is very low since no other person can be called. With each additional customer who connects to the network, it is more valuable to be part of that network.

⁷⁹ M. Motta, *supra*, p.249. Obviously, this reasoning does not apply in case of territorial exclusivity. It flows from this that territorial exclusivity leads to worse results, since even in the presence of (less efficient) upstream rivals the vertically integrated firm will not deliver goods or services to its downstream rivals.

⁸⁰ See for an economic model applying these theories to the OS market, N. Economides, 'Raising Rivals' *Costs in Complementary Goods Markets: LECs Entering into Long Distance and Microsoft Bundling Internet Explorer.*, (1998), <http://raven.stern.nyu.edu/networks/>.

Network effects can be either direct or indirect. Examples of software programs with *direct* network effects are word processors. If one person writes a file using a particular word processor, other persons wishing to read the file need to have the same word processor. Thus, that product is valuable if and when other persons have purchased it as well. Examples of software programs with *indirect* network effects are operating systems (OS). Although customers do not exchange OSs, they will indirectly incentivise other customers to use the same OS for using/opening files which interoperate with their OS. Those products are valuable if and when other persons are purchasing it as well, because other customer purchasing it as well means that demand for the complementary product will be higher and the supply of those complementary products will benefit each individual customer.⁸¹

C. Generally Interface Disclosure Raises Few Competition Concerns

Direct and indirect network effects mutually reinforce each other and result in purchasing decisions being interdependent over time. This may lead to huge first-mover advantages, tipping the market in favour of the first mover. As a result, it appears that there are few long term incentives to foreclose third party access to interface information. Indeed, the more applications can be run on – say – an OS, the more customers will purchase that specific OS. In addition, this explains the vertical integration incentive. In software markets, firms might not only seek to extend their dominance at other stages of the value chain, but they need to do so: by extending their operations one level up or down into the next market or segment, firms increase the indirect network effects. By producing applications for its OS, Microsoft increases the indirect network effects which in turn increase demand for its OS.⁸²

A fortiori, it could be concluded that generally market players appear to have no incentives whatsoever to foreclose third party access to essential interface information. By providing that information, the latter players increase their odds of benefiting from network effects. Moreover, the complementarity of distinct software products/services provides an incentive for entering other parts of the value chain too: given the existence of indirect network effects one may increase sales of one software product by marketing the complement for it. In any event, the risk that vertical integration results in foreclosure of third party software providers or rivals appears to be rather small. Vertical restraints, if any, would not be anti-competitive since third party software providers would have access to the market through the other existing software platforms.⁸³

In fact, all OS vendors have chosen to get most of their revenues from the user side of the market. The corollary strategy is to give developers the possibility to write applications for one's OS, including the necessary information on using the features of the OS, development tools and support, and conferences demonstrating how the OS interfaces are

⁸¹ Note Evans's argument that almost all network effects are in fact indirect network effects. Indeed, even in the examples of the word processor/telephone network there are in fact two distinct groups of users: those who send files/call and those who receive them. Thus, when potential receivers purchase word processing programs/connect to the telephone network, demand for complementary products (i.e. files to send/phone calls) increases, and the supply of those complementary products will benefit everyone. There is a vast body of academic literature on network effects; see *inter alia* N. Economides, 'The Economics of Networks', 14 *International Journal of Industrial Organisation* (1996), pp.673-699; C. Shapiro, H.R.Varian, *Information Rules. A Strategic Guide to the Network Economy*. (Boston, Harvard Business School Press, 1999), pp.352; OXERA, 'Study on Interoperability, Service Diversity and Business Models in Digital Broadcasting Markets.', February 2003, Appendices, pp.4-5.

⁸² See D.S. Evans, *supra*, pp.33-34.

⁸³ See by analogy for vertical integration and network effects in relation to broadband platforms J.B. Speta, 'Handicapping the Race for the Last Mile?: A Critique of Open Access Rules for Broadband Platforms.', 17 *Yale Journal on Regulation* (2000), pp. pp.39-91; C.S. Yoo, 'Vertical Integration and Media Regulation in the New Economy.', 19 *Yale Journal on Regulation* (2002), pp.171-300.

evolving. Some of these services are offered for free, others are charged for. Microsoft, for instance, offers five different development packages. Those packages include varying levels of access to and discounts on technical resources and support, code, samples, documentation, development tools, software and hardware. Apple adopted a similar strategy: APIs are disclosed for free, but a fee is charged for (authoring) tools that help developers use the APIs.⁸⁴

D. Software Interfaces: Two-Way Bottlenecks and Two-Sided Markets

However, it is suggested that the above might increasingly be called into question: The peculiar nature of software products/services makes that it is by no means sure that economic theories on vertical restraints and network effects apply without reservation.

There is an interesting analogy to be drawn between the issue of *software* interfaces, on the one hand, and design rights in *physical* interfaces, on the other hand. Physical interfaces were the subject of the Design Rights Directive. Indeed, complex products are composed of various elements which interact through a physical interface. During the 5-year lasting discussion of this Directive much controversy arose on the question whether the design rights for a complex product can be considered to cover also spare parts for repair purposes – a problem of particular concern to the automotive industry. It was about enabling the holder of design rights to exercise a monopoly of the spare parts market. Some countries, such as the UK, promulgated a so-called ‘must-match’ exception to that IPR. That is, the features that must be of a certain shape or configuration to be useful (such as spare parts) can be made without infringing the design right.⁸⁵

The question arose (i) whether and to what extent the must-match exception needed to be extended to all MS in the Directive. Originally, Art.14 had such a must-match exception for spare parts. However, this exception would not have applied until three years after the product incorporating the design was put on the market, thus giving original manufacturers of complex products a three year period of protection in respect of must-match spare parts. This proposal was then replaced with licence of right provisions: third party manufacturers could make such spare parts provided that the right-holder was notified and offered a fair remuneration. Finally, that proposal was rejected following intense lobbying of car manufacturers. It appears that the only check on proprietors of design rights is thus via competition law (e.g. *Volvo* case).

(ii) Denmark managed to obtain a second significant exception to the unprotectability of physical interfaces – its main intention was to protect the Danish LEGO brand. Thus, the preamble provides that protection must not hinder the interoperability of products of different makes. In certain cases, however, the mechanical fittings of modular products may constitute an important element of the innovative characteristics of modular products and present a major marketing asset. They should then be eligible for protection. As a result, Art.7 now provides that design right shall subsist in a design serving the purpose of allowing multiple assembly or connection of mutually interchangeable products within a

⁸⁴ See D.S. Evans, *supra*, pp.19-21. Evans also talks about the strategy of Palm, the leading OS vendor for handheld personal digital assistants, and shows how their business model is similar. Although Palm first extensively engaged in writing applications, it has recently focused on attracting third party developers for its OS.

⁸⁵ That exception was emphasised in *British Leyland v. Armstrong Patent* [1986] 2 WLR 400. There are some differences between the exception in relation to respectively registered designs and design right, see and compare D. Bainbridge, *Intellectual Property*. (Harlow, Longman, 2002 – fifth edition), pp.476 and 500-501.

modular system. In sum, interfaces of complex products are primarily unprotected, but there are two important exceptions: spare parts and lego blocks.⁸⁶

The above *intermezzo* is useful for two reasons: (i) just like with the spare parts and lego blocks, the software interfaces are the critical elements through which market power is leveraged into adjacent segments of the value chain. Car manufacturers or producers of modular products control the tangible interface by means of a design right. As we saw, intangible software interfaces are *de facto* 'propertised' like those tangible interfaces because these are extremely hard to find, and due to the restrictive conditions under which third party software writers are entitled to trace such interface information.⁸⁷ (ii) Secondly, it enables one to grasp the difference between the functions of the various types of interfaces. It is suggested that interfaces have an even more critical role in modular systems.

First, modular systems evolve in a very rapid and unique manner.⁸⁸ "Individual modules will exhibit higher variety and higher performance. The whole system will become more complex as old modules are split and new ones added to the system to existing interfaces. This is the process of design evolution. This change has profound implications for the firms and the economic system surrounding artifacts and designs."⁸⁹ A good example can be spotted in *US v. Microsoft* where it was claimed that the latter had abused its dominant position, *inter alia*, by preventing third parties from distributing or preventing complements to Internet-based technologies outside Microsoft's control such as Netscape's browsers or Java based platforms. Arguably, Microsoft's anti-competitive behaviour was its resistance against rapid developments associated with the modular character of the value chain. Microsoft not only sought to block third parties from acting as complementary collaborators with those innovative technologies; it sought to block the emergence of the latter because it thought that widely distributed Internet technologies outside its own control would lower entry barriers into the Windows monopoly.⁹⁰ This is because through their own APIs those Internet technologies might otherwise have taken over some of the critical OS functions.⁹¹ Importantly, the latter case thus provides a good example of a vertical foreclosure case in two senses. Software goods/services are much more malleable than physical or tangible goods, and the functions are not associated with particular stages of the value chain – foreclosure may therefore arise against market players seeking to deliver functionalities in direct competition with the ones presently delivered at *either* stage around the interface.

More generally, in the above example of the car spare parts the interface provides for one-way access; in contrast, with lego blocks (i.e. modular systems) the access is essentially two-way. Put differently, a spare part manufacturer who gets 'access' to the interface can

⁸⁶ See Directive 98/71/EC on the Legal Protection of Designs, *O.J.* L.289, pp.28-35; D. Bainbridge, *supra*, pp.493-494.

⁸⁷ Cf. *supra*.

⁸⁸ See on modular systems C.Y. Baldwin, K.B. Clark, *Design Rules. The Power of Modularity*. (Cambridge Massachusetts, MIT Press, 2000), pp.6-14. "Computers proved amenable to an approach called modularity in design. (...) When a design becomes truly modular the options embedded in the design are simultaneously multiplied and decentralized. The multiplication occurs because changes in one module become independent of changes in other modules, decentralisation follows because, as long as designers adhere to the design rules, they are free to innovate without reference to the original architect." See also Y. Benkler, 'Coase's Penguin, or, Linux and the Nature of the Firm.', 112 *Yale law Journal* (2002), in which the author calls this phenomenon 'granularity'.

⁸⁹ C.Y. Baldwin, K.B. Clark, *supra*, p.92.

⁹⁰ T.F. Bresnahan, 'The Economics of the Microsoft Case.', Stanford Law School, John M. Olin Program in Law and Economics, Working Paper 232, (2002), available at http://papers.ssrn.com/sol3/delivery.cfm/SSRN_ID304701_code020321530.pdf?abstractid=304701.

⁹¹ Likewise, @Home is acting very much like Microsoft, using the OS to block certain applications; only the technological innovations that line up with their interests will be pursued. See L. Lessig, *The Future of Ideas. The Fate of the Commons in a Connected World*. (New York, Random House, 2001), p.158.

make his spare parts interoperate with the car; a lego block competitor who gets ‘access’ to the lego interface can potentially make his pieces interoperate with all the modules of the original lego block manufacturer – not just the piece to which access is made, but also the pieces which are themselves designed to interoperate with that piece. Access here is essentially two-way (See Chart 2). Similarly, if A gives (third party software writer) B a licence to reproduce the interface between the various components of its modular software system, then this means (a) that B2-type pieces can interoperate with A1, (b) but equally that, if B produces modules similar in function and nature to A1, then his B1-type pieces can equally interoperate with A2. In sum, in a modular system, interface control potentially prevents competition at two stages of the value chain, instead of one.

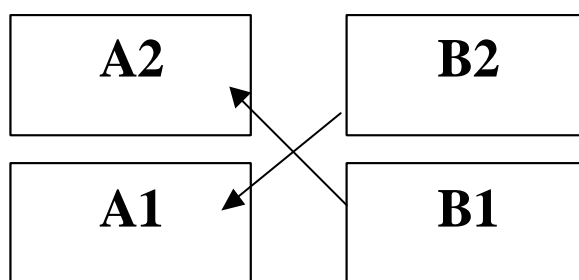


Chart 2: Interoperability and Two-Way Access

Now, the above finding appears to point to what may be a critical difference between the various components of the communications value chain. Access to – say – cable networks (physical layer) is often considered in similar terms as access to software platforms (i.e. one-way vertical). However, software is more similar to modular systems (lego blocks). In *US v. Microsoft*, for instance, the District Court found that in order to compete effectively with Microsoft in the desktop operating systems market for Intel-compatible PCs, systems equipped with the free software operating system should be able to interoperate with “the enormous reservoir” of Windows applications. As Moglen points out “[t]here is no inherent barrier to such interoperation, only an artificial barrier erected by Microsoft. If Microsoft were required to release information concerning its APIs to the developers of free software, GNU, Linux, the X windowing system, the WINE Windows emulator, and other relevant free software could interoperate directly with all applications that have been developed for Windows. Anyone could execute Windows applications programs bought from any developer on Intel-compatible PC's equipped with the competing free software operating system.”⁹² APIs (and arguably other software non-user interfaces) are thus like the (physical) interfaces between the various modules of the lego block example – controlling APIs means to control for competition at two stages of the software value chain, not just one.⁹³ This is an important variable irrespective of whether the market player who controls the interface is dominant.

As a result, one ought to be careful before applying classic economic findings on vertical restraints and network effects to modular systems such as software. When

⁹² E. Moglen, *Tunney Filing of the Free Software Foundation in United States v. Microsoft.*, (2002), p.2; available at <http://emoglen.law.columbia.edu>.

⁹³ Another critical element of the software value chain, which is however not discussed in this paper, is the so-called user interface. User interfaces consist of the set of dials, knobs, operating system commands, graphical display formats, and other devices provided by a computer or a program to allow the user to communicate and use the computer or program. See for the legal status of user interfaces: D. Bainbridge, *supra*, pp.96 ff.; M.J. Schallop, ‘Protecting User Interfaces: Not as Easy as 1-2-3.’, 45 *Emory Law Journal* (1996), pp. pp.1533-1582.

considering vertical integration and/or (indirect) network effects, one usually thinks of these markets as one-way markets. Indeed, the theory on vertical restraints is about contracts between market players with distinct functions, and acting at distinct stages of the value chain – for instance, contracts between suppliers of raw materials and producers, or between wholesalers and retailers. Similarly, indirect network effects is generally thought of as effecting two distinct segments of the value chain with particular well-defined functionalities – for instance, the exchange of audio CDs (direct network effects) which in turn incentivises customers to buy CD players (indirect network effects). Thus, control of interfaces or specifications (or in the latter example: standards) enables certain firms to leverage market power into adjacent but distinct markets. In contrast, access to software platforms via interfaces may reveal interesting two-way effects. In other words, because of its modular character risks are sometimes just as great to lose both sides of the market if access is granted indiscriminately.

Finally, new economic findings indicate that the classic theories on vertical restraints and network effects do not fully apply to some software: OS markets, for instance, are so-called two-sided markets. Although two-sided markets theory is related to vertical integration and network effects, it differs markedly from vertical restraints theory in certain respects.⁹⁴ Economists are only beginning to research the possible implications of this fact.⁹⁵ Markets are two-sided if at any point in time there are (i) two distinct groups of customers; (ii) the value obtained by one kind of customer increases with the number of the other kind of customers; and (iii) an intermediary is necessary for internalising the externality created by one group for the other group. Hence, complements in such two-sided markets are much more essential, because offering the complement is the only manner to solve the chicken-and-egg problem. Such markets tend to result in businesses that supply both sides of the market, and adopt special pricing strategies in order to get both sides of the market on board – producers and users.⁹⁶ This will often mean that access to – say – critical OS interfaces (APIs) will be granted. However, this is not always the case: video game platforms, for instance, get most of their income from the game *producer* side of the market, implying that third party access pricing may more easily be prohibitive for some producers, and software interoperability less straightforward than with classic OS.⁹⁷ In sum, economists have only started researching on the economics of two-sided markets, and the situation is still far from clear with respect to (inherently modular) software.⁹⁸

3.3 – Software Interoperability and Competition Law: Selected Problems

Public interest regulation and competition law are complementary bodies of law. To the extent that the former laws are insufficient to redress market failures, competition law ought to provide the appropriate remedy. As explained above, the law is built on economic theories on vertical restraints. Vertical restraints are especially worrying if there is market power at one of the stages of the value chain. However, public interest regulation on software interoperability does not provide for special rules for players possessing

⁹⁴ See J-C. Rochet, J. Tirole, 'Defining Two-Sided Markets.', *Submission for Toulouse Conference on The Economics of Two-Sided Markets*, January 15, 2004, pp.23-25.

⁹⁵ See for instance M. Armstrong, 'Competition in Two-Sided Markets.', October 2002, available at <http://www.econ.ucl.ac.uk/downloads/armstrong/venice.pdf>. J-C. Rochet, J. Tirole, 'Platform Competition in Two-Sided Markets.', *Journal of the European Economic Association* (2003), pp.990-1029; D.S. Evans, 'The Antitrust Economics of Multi-Sided Platform Markets.', *20 Yale Journal on Regulation* (2003), pp.325-381.

⁹⁶ See D.S. Evans, *supra*, p.34.

⁹⁷ See A. Hagiu, 'Optimal pricing and commitment in two-sided markets.', *Toulouse Conference on Two-Sided Markets*, January 23-24, 2004, p.4.

⁹⁸ In any event, there were several cases in which interface disclosure was a point of contention between software firms; see M.H. Morse, 'Vertical Mergers: Recent Learning.', *53 Business Lawyer* (1998), p.1227 ff.

significant market power. This section thus considers whether competition law is an effective tool for redressing possible inefficiencies in this regard, with particular reference to software interface disclosure. It concludes that (A) methodological problems arise with respect to the normal application of competition law to bottleneck features, and (B) that certain critical issues on software interoperability are clearly beyond the legitimate reach of competition law anyhow.

A. Applying Classic Competition Law Methodology to Bottlenecks

Specifically, one of the most complex issues for competition law is currently whether and how it can be applied to bottleneck facilities. Normally no market definition can be carried out if the good or service is supplied to market players at no price or below the lowest price offered by the potential sellers. This is because market demand, in the classic sense of the word, is failing. However, for bottleneck facilities the fact that the good is not supplied in normal market conditions does not necessarily mean that no market should be defined. On the contrary, some authors contend that there may be a need to define markets for goods in which there is no trade. The reason is that a refusal to supply that facility or good may in certain circumstances amount to an abuse of a dominant position if the result is that competition in a downstream market is hindered (even if it does not give rise to dominance in that market). They conclude that, paradoxically, even in case no trade can be observed, one may still define the market as the one for the supply of that particular facility.⁹⁹

The above issue arises, for instance, in relation to access control services for digital television (DTV) platforms. If there are two competing platforms with differing sets of “proprietary” APIs, to which ‘access’ is needed for providing interactive digital applications, then the issue arises as to whether each platform should be considered a separate market, or alternatively whether the two platforms are part of the same relevant market. According to OFTEL, each platform would then constitute a separate relevant market if there are substantial switching costs – here, the costs involved in re-authoring (re-writing) content from one set of APIs to the other.¹⁰⁰

Another, arguably more fundamental, reason for this is that the service supplied in providing access to the APIs is access to a distinct group of households. When asking access to a set of software interfaces, access is in fact sought to the group of persons using the software program operating with that set of interfaces. That group of persons is distinct from the group of persons using another program with another set of APIs. If the assumption is met that there will be little overlap between the customer bases for each product, then each product or service may well be found to be in a separate product market. This is all the more true when considering that most content or applications available on each of those platforms will not, on its own, cause customers to switch platforms. Conversely, applying the SSNIP test, one may note that a small content or applications provider is unlikely to switch between platforms following an increase in relative access prices. However, as platform competition increases and digital services become more crucial, the availability of important content (e.g. the BBC) or applications may cause subscribers to switch platforms and may thus result in one single relevant market for access services.¹⁰¹

⁹⁹ See Europe Economics, ‘*Market Definition in the Media Sector - Economic Issues. Report for the European Commission, DG Competition.*’, November 2002, p.51.

¹⁰⁰ OFTEL, ‘*SSSL as A Regulated Supplier*’, 1999, para.2.16. See also Bird & Bird, *Market Definition in the Media Sector - Comparative Legal Analysis. Report for the European Commission, DG Competition.*, December 2002, p.185.

¹⁰¹ See Europe Economics, *supra*, p.51.

Other authors nonetheless question the above. Applying competition law in such a manner means to stretch it beyond recognition.¹⁰² As concerns *market definition*, one could speak of a market for access. This notion is however highly problematic because the focus of the analysis is then access to property, and by definition the holder of a facility (or the controller of software interfaces) will be held to have a dominant position on that particular relevant market. Alternatively, one could apply the collective dominance concept and hold that the various firms controlling relevant software interfaces are collectively dominant on the relevant market.¹⁰³ However, it is doubtful whether such a finding would be persuasive on a highly dynamic market such as the software market.

Eventually, bottleneck cases are not like normal 'refusals to supply'. In the latter type of cases (e.g. *Commercial Solvents*) two easily identifiable relevant markets can be denoted in a vertical setting – those are the market for the facility where a firm may be dominant and to which the other firm needs access in order to compete on a distinct market downstream. In contrast, in the case of bottleneck facilities such as software interfaces there may not be any market in the casual sense of the word and most authors simply assume that the facility is the relevant market. In the absence of any access granted to third parties, the finding of a market for access appears to go beyond the scope of competition law. In any event, the crucial market definition exercise needs to be side-stepped in bottleneck cases and thus poses serious problems to the application of competition law on bottleneck goods/services

Likewise, the *competitive concern* is different in bottleneck cases. While the focus of classic competition analysis (including classic cases on refusals to supply) is on dominance, that notion of dominance becomes less important in bottleneck cases. Here essentiality is the key concern, namely securing third party access to the facility. Competitive concerns arise not so much as a result of dominance but rather because the bottleneck good/service would be essential for participation on another market.

Finally, the fact that in bottleneck cases access may be imposed to markets in which there is no trade also means something as concerns the *remedies* to be imposed. In classical cases, the remedy will usually be an order to resume trade on former conditions, or it will involve an appreciation of third party pricing conditions. As was explained above, pricing issues are always complex, and competition authorities are generally reluctant to engage in close supervision of pricing agreements. In bottleneck cases, however, the situation is even more worrisome. Indeed, given the possible absence of trade in the facility there may not even be any guidance; and consequently the competition authority might have to fashion a remedy from scratch. This implies that this authority has to enter into complicated computations on the value of access and how it should be priced.¹⁰⁴ Larouche cogently argues that caution is advisable because internal company processes do not necessarily correspond to what would happen on the marketplace. This is logical since the possibility of internalizing marketplace arrangements is the paramount reason for creating firms in the first place.¹⁰⁵

B. Beyond Methodology: Legitimacy

In fact, it appears that software interfaces raise a number of policy decisions for which competition law's methodology would not merely be stretched to the extreme (as explained

¹⁰² P. Larouche, 'A Closer Look at Some Assumptions Underlying EC Regulation of Electronic Communications.', 3 *Journal of Network Industries* (2002), pp.138-140.

¹⁰³ For a brief discussion of collective or joint dominance, cf. *supra*.

¹⁰⁴ P. Larouche, *ibid*.

¹⁰⁵ P. Larouche, *Competition Law and Regulation in European Telecommunications*. (Oxford, Hart Publishing, 2000), pp.203-211. See, of course, the seminal article on this: Ronald H. Coase, 'The Nature of the Firm.', 4 *Economica* 386 (1937).

under the previous heading), but moreover be clearly inadequate. This can be denoted, for instance, with respect to the particular concepts of discrimination and property. The following paragraphs briefly discuss the property and discrimination aspects of the State's policy on software.

(i) First of all, let us focus on the classic distinction between public interest regulation and competition law, the two regulatory methods through which the behaviour of market players is being controlled. The difference between these two regulatory tools is not necessarily in the ex ante/ex post distinction since competition law is also often applied ex ante, for instance in the merger regulation. The distinctive nature of competition law lies in its case-bound nature. Competition law relies on individual cases and this is exemplified by the nature of the block exemptions and notices which both also build on individual decisions. By contrast, public interest regulation is derived from the consensual legislative model for drafting rules.¹⁰⁶

Property rights only exist to the extent that the legal system is willing to recognise and enforce them. As far as real property is concerned, the law is said to create property rights for inducing creation, but also for ensuring efficient use of the resource, that is, prevent overuse. Intellectual creations such as software, on the other hand, exhibit features of public goods. They are non-rivalrous (A's use does not impinge on B's use) and non-excludable (A cannot prevent B from taking advantage of it). The property rights in question are to a large extent concerned with inducing creation. Without IPR people have fewer incentives to create intellectual capital, else they cannot recoup their investments; so the mainstream theory goes. At the same time, assigning too strong exclusive rights might hamper further innovation. Thus, the traditional legal solution has been to grant exclusive property rights which expire after a fixed period of time.¹⁰⁷

However, to be sure, property has many possible faces. In fact, one of the main policy choices is between property rules and liability rules.¹⁰⁸ The norm in legal systems has been and continues to be the use of property rules. In such a system, the holder of the property interest can prevent others from exploiting the property without his or her consent. Anyone wishing to gain access must negotiate the terms of access with the property holder. Injunctive relief is available as a remedy against third party access occurring without the property holders' consent. In contrast, in a system of liability rules the interest holder cannot prevent others from exploiting the property but receives financial compensation from those who do so.¹⁰⁹

As we saw, software markets are characterised by pervasive network effects (i.e. tending to dominance), an increasing need for interconnectivity or interoperability (i.e. the products have little stand-alone value), rapid innovation (i.e. delaying access is damaging; it is no option to wait) and easy excludability (i.e. easy to keep secret, or use engineering to exclude). An increasing number of people will thus need access, and this needs to be done as quickly as possible in order to allow for innovation. By the same token, it is easy to exclude competitors, which may be damaging for innovation. Thus, one of the main policy choices in software environments will be on the nature of property in software. Should we

¹⁰⁶ See for a clear explanation of the classic distinction: P. Larouche, *supra*, p.124.

¹⁰⁷ See for a nice overview: D.R. Wagner, 'The Keepers of the Gates: Intellectual Property, Antitrust, and the Regulatory Implications of Systems Technology.', 51 *Hastings Law Journal* (2000), pp.1073-1129.

¹⁰⁸ The seminal article on this issue is of course G. Calabresi, A.D. Melamed, 'Property Rules, Liability Rules and Inalienability: One View of the Cathedral.', 85 *Harvard Law Review* (1972), pp.1089 ff.

¹⁰⁹ See for instance L. Lessig, *The Future of Ideas. The Fate of the Commons in a Connected World.*, in the footnote on p.27, asserting that 'free' could mean two distinct things in legal theory: either no one has entitlements, or it is a liability rule. See also R. Cooter, T. Ulen, *Law and Economics*. (Reading, Massachusetts, Addison-Wesley Publishing, 1997 – second edition), pp.97 ff.

keep the current property regime, in which the power to exclude rests with the property holder, or should we go for a different balancing of interests? Possible variants of the liability-type regimes are simple access rights to the technology, the right to full information about the technology, and the more intrusive right to control the disposition and dissemination of the technology.¹¹⁰

Each time, the State should assess the degree to which the introduction of a specific property regime may reduce the endeavour to innovate in competing technologies, and the incentive of the firm itself to innovate on or improve the facility itself. Another clear difficulty linked to the liability rule regime is the valuation of access. The state has the final duty to decide which prices would be fair, reasonable and non-discriminatory. In a pure property rule- system this is left to the parties. Nevertheless, liability rule-regimes do not necessarily compel court valuation. It is only in case market transactions fail that the parties have recourse to legal action. These successful market transactions can then be used for later valuations by the court.

To sum up, the property concept as regards software is of course determined in the first place through public interest regulation. Competition law may effect this baseline property concept in a number of individual decisions; in fact, the property concept underpinning the Software Directive emerged amidst debate and controversy, principally following IBM's refusal to disclose interface information and the subsequent undertakings given by the latter firm in order to prevent Art.82 proceedings.¹¹¹ But a competition law analysis starts from the property-concept introduced by public interest regulation.

(ii) Yet another critical facet which cannot totally be accounted for by competition law is the right to non-discrimination. It is suggested that competition law mainly concerns one side of the non-discrimination principle. Indeed, Art.82 explicitly provides that one of the possible abuses of a dominant position is "applying dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage." In *Tetra Pak*, for instance, the European Commission and the ECJ agreed that Tetra Pak had been selling its products at discriminatory prices between its third party customers.¹¹² As was explained above, this discrimination pattern has been extended to include discrimination between a third party customer and the dominant player's subsidiary.¹¹³

It is well-known that the non-discrimination principle does not exclude a difference in treatment on the condition that this difference is based on objective criteria which could reasonably be justified. Indeed, both competition law and public interest regulation go some way towards recognising this: provided there is an objective justification market players may impose different conditions, and the regulator may, for instance, impose different treatments for different categories, provided this is objectively justifiable in law.

However, the point is that the very application of the discrimination principle under those distinct legal regimes may vary, and even conflict. This is because the focus of the analysis is distinct: under competition law the objective justification is assessed on a case-by-case basis having regard to the position of the dominant market player, while the focal point under public interest regulation is on the State's policy choice. Similarly, the burden of proof lies on different actors, and the types of justification advanced for discriminating

¹¹⁰ For an example of an author arguing that these factors demand the adoption of liability rules, see D.R. Wagner, *supra*.

¹¹¹ See S. Lai, *supra*, p.97.

¹¹² Case T-83/91, *Tetrapak* [1995] ECR. II-755, [1997] 4 CMLR 726, CFI judgment of 6 October 1994. In addition to discrimination along national lines (and thus encroaching on one of the central tenets of EC law), Tetra Pak was also held to discriminate between its various customers within one MS (Italy).

¹¹³ Cf. *supra*

between the various undertakings will vary.¹¹⁴ Put differently, competition law is about assessing the similarity of particular trading transactions with a given dominant player; while public interest regulation is about assessing the similarity of situations taken in their entirety, and from the point of view of society as a whole.

An even more fundamental point is thus the fact that non-discrimination has two sides. Indeed, the right to non-discrimination means that one may not impose different treatments in similar circumstances; but it equally encompasses the right *not* to be treated the same if the circumstances are different. In other words, what is the role of competition law if dominant players give the same access price; could it be used by third party software providers for obtaining a different price if the situation were to be considered different? In fact, although competition authorities are perfectly entitled to intervene in order to account for this type of discrimination, they are generally cautious in this respect.¹¹⁵

Generally speaking, there are signs that the Commission is willing to tone down the application of discrimination principle in Art.82, thus infusing competition law with concerns traditionally associated with public interest regulation (i.e. preventing all too easy third party access by means of the non-discrimination concept in order to induce innovation).¹¹⁶ It is suggested that this is correct: one should be careful in extending the role of competition law to this type of situations. The result would be an overly interventionist competition law authority, and, as we saw, competition authorities are (correctly) *prima facie* reluctant to engage in such intrusive analyses.

As a result, it is believed that competition law is insufficient to fully address all the policy issues which may arise. It might be that, for policy reasons, access of certain types of software should be furthered. This might include a different pricing for similar trading transaction, provided that it can be objectively justified on the grounds that the overall situation is different. For instance, the question arises whether interface disclosure should be dictated by the same principles with respect to non-commercial software writers (e.g. Linux). From a competition law point of view, non-commercial players constitute a trading partner on the same terms as commercial software providers. From a public policy point of view, however, one might well argue that the overall situation is different, and that for objectively justifiable reasons the access terms to essential interface information should therefore be different.

3.4 – Conclusion

It is suggested that the starting point of any analysis of software regulation ought to be the fact that in an era of convergence software not only forms (part of) an economic sector, but also and even more constitutes a foundation for the proper functioning of the whole economy and society. Software must operate to discharge its foundational role for society. Thus, a number of critical policy decisions need to be taken in relation to, *inter alia*, software interfaces.

Competition law might well be adequate to address economic or efficiency concerns; indeed it might even to some extent fulfil a democratic function in preventing large accumulations of power; but it most certainly fails to adequately cope with a number of wider societal concerns. As we saw, competition law faces serious problems regarding its application to bottleneck facilities such as software interfaces; more particularly at the stages of defining relevant markets, focusing on the competitive concern, or creating the appropriate remedy. In addition, competition authorities cannot legitimately determine (but

¹¹⁴ On this possible conflict between the discrimination principle in sector-specific regulation and competition law, see P. Larouche, *supra*, pp.218-231.

¹¹⁵ See R. Whish, *supra*, p.658.

¹¹⁶ P. Larouche, *supra*, p.229-231.

only interfere with) the baseline right to non-discrimination, or the property concept.¹¹⁷ It follows that public interest regulation must complement competition law, with particular focus on that foundational role.¹¹⁸

At the same time, the point is that this foundational role is itself subject to legal constraints. Indeed, policy decisions should be in line with constitutional requirements, most notably in communications matters with the right to freedom of expression. Constitutional law should moreover shed some light on the right mix and scope of competition law and public interest regulation. However, though this point is obvious, it has paradoxically enough not yet been granted much (if any) attention in European communications law. The next section thus seeks to start a wider debate on this topic.

IV. Re-Thinking Software Interoperability: Constitutional Law as the Ultimate Arbiter

4.1 – Introduction

Unsurprisingly, the above set of legal provisions aiming at achieving interoperability raise fundamental (or constitutional) questions. Consider the following example: A has written a software application and wants to market it. On its own, this application is probably not worth much. Invariably, a computer program will need to work in conjunction with another program. In order to be valuable this piece of code might thus need to interoperate with, for instance, B's existing platform and applications. On the one hand, it might be in B's interest to have one more application which is compatible with his products, as it makes the product more attractive to end-users. On the other hand, B might have competing products or products similar to A's code; B's access price might be prohibitively high, or there might be other unclarified reasons making A's access to the software platform difficult. So far, it was highlighted that EU software regulation allows reproduction of (parts of) B's code for the purpose of achieving interoperability. In practice, this means that A has the right to disassemble or decompile B's code in order to find the relevant interfaces (provided the various conditions listed in the law are satisfied). However, finding these interfaces might be hard, and moreover needs to be achieved in a timely manner given the rapid pace of software markets. Moreover, it might be very difficult (and certainly time-consuming) to prove that B is abusing his dominant position, in order to obtain the release of the relevant interfaces, especially considering the methodological difficulties highlighted above.

Instead of invoking public interest software regulation or competition laws, A might argue that the relevant laws determining software interface disclosure infringe her right to freedom of (at the very least, commercial) expression in the form of software.¹¹⁹

¹¹⁷ Yet another clear public policy issue is the question where to place the 'intelligence' of the network.

Intelligence refers to the addition of information storage and processing capabilities (convergence with IT). There is a debate whether this intelligence should be placed at the end (end-to-end), or at the centre. In the Internet paradigm, the intelligence lies at the ends, while the current broadcasting paradigm still relies on a 'dumb' receiver and places the intelligence with the broadcaster. See P. Larouche, *supra*, p.329. See L. Lessig, *supra*, p.78. See also N. Negroponte, *Being Digital*. (New York, Alfred A. Knopf, Inc., 1995), pp.243.

¹¹⁸ See for such a reasoning applied to the telecommunications industry: P. Larouche, 'A Closer Look at Some Assumptions Underlying EC Regulation of Electronic Communications.', 3 *Journal of Network Industries* (2002), p.142.

¹¹⁹ Careful readers will not fail to note that the interface between software and the right to freedom of expression provides for many more (equally interesting) riddles for the near future which it was, sadly enough, not possible to address in this paper. Consider a case in which A has written a software program which enables users to circumvent copyright protection for B's products. A has disseminated the code on the internet. B lodges proceedings with the court, whereby A invokes his fundamental right to freedom of expression in the form of software code. Or more generally, what about the constitutional status of software copyright, let alone software patents, as impinging on software expression?

The above example makes clear what was missing in the Chart 1. Indeed, competition laws and public interest regulation do not operate in a vacuum, but are determined by constitutional provisions. The paper now considers EU regulation on software interoperability in this new perspective. What role can/should Art.10 ECHR play in assigning each regulatory realm distinct and pertinent tasks in relation to software interface disclosure?

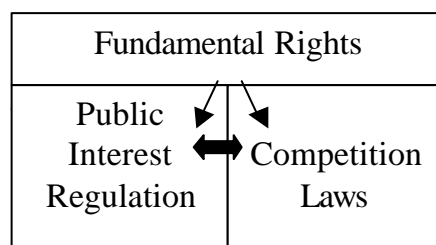


Chart 3: The Overarching Constitutional Layer

4.2 – The Right to Freedom of Expression (Art.10 ECHR)

The present argument focuses on software interoperability from the viewpoint of EU law. It is generally recognised that EU legislation and measures need to comply with the requirements of Art.10 ECHR.¹²⁰ For the purpose of this paper, it will be assumed that Art.10 ECHR is applied in the EU context, as in the judgments of the European Court on Human Rights (ECtHR).¹²¹ Where needed, specific EU developments in the area of fundamental rights will be highlighted.

Art.10 ECHR reads as follows:

- (1) everyone has the right to freedom of expression. This right shall include freedom to hold opinions and to receive and impart information and ideas without interference by public authority and regardless of frontiers. This article shall not prevent states from requiring the licensing of broadcasting, television or cinema enterprises.
- (2) The exercise of these freedoms, since it carries with it duties and responsibilities, may be subject to such formalities, conditions, restrictions or penalties as are prescribed by law and are necessary in a democratic society, in the interest of national security, territorial integrity, or public safety, for the prevention of disorder or crime, for the protection of health or morals, for the protection of the reputation or

¹²⁰ See for instance cases C-260/89, *Elliniki Radiophonia Tilleorassi* [1991] ECR I-2925, at 2964; C-368/95, *Bauer Verlag (Familiapress)* [1997] ECR I-3689, at para.24.

¹²¹ While the ECtHR has been ruling on fundamental rights issues for many years (that is, within the legal order of the Council of Europe which consists of over 40 countries), the ECJ (which is the highest court in the EU's legal order presently still made of 15 Member States) is sometimes less convincing in applying fundamental rights issues. For instance, it was held in Case C-112/00, *Eugen Schmidberger* at para.66 that "the specific aims of the demonstration are not in themselves material in legal proceedings." However, academic literature rightly pointed out that this is misconceived. The jurisprudence of the ECtHR clearly indicates that a distinction must be made between commercial and political speech. The latter type of speech is given greater protection. In other words, in the ECtHR's view the nature of the demonstration or speech is an important element that needs to be taken into account. See C. Brown's case note in: 40 *Common Market Law Review* (2003), pp.1504-1505.

rights of others, for preventing the disclosure of information received in confidence, or for maintaining the authority and impartiality of the judiciary.

The classic three-step analysis of the European Court of Human Rights is now applied to software. First, it needs to be evidenced that Art.10 ECHR applies to software (*coverage*). Second, once this is ascertained, the question arises which rights and duties Art.10 embodies in relation to communications software (*rights and duties*). Third, State measures in this respect need to comply with, and strike a fair balance between, the various rights and duties of Art.10. To this effect, Art.10(2) provides a three-step test against which State measures can be checked (*justifications*). Finally, depending on the particular subject matter, States may enjoy a certain discretion (*margin of appreciation*).

A. Coverage

There is no doubt that Art.10 applies to the regulation of software goods and services. Software is a means for imparting/receiving ‘information’ or ‘ideas’; and the dissemination of software is itself an act of imparting ‘information’ or ‘ideas’ in the sense of Art.10(1).

Indeed, software is subsumed under Art.10(1) as a means for imparting information or ideas. In *Autronic*, the ECtHR recognised that ‘Art.10 applies not only to the content of information but also to the means of transmission or reception since any restriction imposed on the means necessarily interferes with the right to receive and impart information.’¹²² Software as a significant part of the new media for imparting and receiving information (e.g. the Internet), certainly falls within the ambit of Art.10(1).

Most crucially, however, disseminating software also constitutes an expression of information or ideas in its own right, in the sense of Art.10(1) ECHR. The term ‘information’ includes, at the very least, the communication of facts, news, knowledge and scientific information (e.g. software source code). Moreover, the provision is phrased in media-neutral terms, applying to old and new media alike.¹²³ The Court has confirmed this very broad construction of the provision by avoiding any restriction on the ambit of the terms ‘information’ or ‘ideas’. In *Groppera*, for instance, it did “not consider it necessary to give on this occasion a precise definition of what is meant by ‘information’ and ‘ideas’.”¹²⁴ In addition, the arguments of contracting States that a particular type of activity is not expressive are usually unsuccessful.¹²⁵ In fact, Art.10 ECHR is intended to be interpreted broadly. This is logical since any restriction on Art.10(1) would undermine the balancing test to be carried out under Art.10(2), as discussed further in this paper.

B. Rights and Duties

(i) *Software as Expression* – The application of Art.10 to software expression implies various rights and duties. The core right of Art.10 ECHR is foremost the individual’s right to impart ‘information’ or ‘ideas’. However, Art.10(1) also confers the right to receive ‘information’ or ‘ideas’, as was confirmed by the ECtHR in *Leander*. In that case, it held

¹²² See *Autronic AG v. Switzerland*, Judgment of 22 May 1990 (No.178), 12 EHRR 485, para.47.

¹²³ B. Hugenholtz, ‘Copyright and Freedom of Expression in Europe.’ in R.C. Dreyfuss, H. First and D.L. Zimmerman (Eds.), *Innovation Policy in an Information Age*. (Oxford University Press, Oxford, 2000). One might argue that a distinction needs to be made between source and object code. However, as the translation between source and object code back and forth is perfect if the programming language is known, it is hard to see why there should be a distinction between both stages of the production of software. This is not addressed in detail above, due to space limitations.

¹²⁴ *Groppera Radio & Others v. Switzerland*, Judgment of 28 March 1990 (No.173), 12 EHRR 321, at para.55.

¹²⁵ A. Nicol, Andrew, G. Millar and A. Sharland, *Media Law and Human Rights* (London, Blackstone, 2001), at p.14.

that Art.10(1) ECHR ‘basically prohibits a government from restricting a person from receiving information that others wish or may be willing to impart to him.’¹²⁶ Thus, the right to receive ‘information’ or ‘ideas’ primarily depends on the willingness of the (legal) person imparting the information.

Obviously, the right to impart and receive ‘information’ or ‘ideas’ goes together with a set of State duties. First, the State incurs the classic obligation not to interfere with the exercise of the rights embedded in Art.10. Second, the Court has long held that, although the essential object of many provisions of the ECHR is to protect the individual against arbitrary interferences by public authorities, there may in addition be positive obligations inherent in an effective respect of the rights concerned. The State duty to protect is based on the principle that fundamental rights must also be effectively secured against threats emanating from non-State sources.¹²⁷

The positive duties doctrine was discussed at length in *Plattform ‘Ärzte für das Leben’*. In that case, applicants successfully argued that the State had failed to grant them their right to hold a demonstration, because it had failed to prevent a counter demonstration from hindering their own demonstration. The ECtHR confirmed that ‘[g]enuine, effective freedom of peaceful assembly cannot (...) be reduced to a mere duty on the part of the State not to interfere: a purely negative conception would not be compatible with the object and purpose of the provision [but] sometimes requires positive measures to be taken, even in the sphere of relations between individuals.’ The State is supposed to take ‘reasonable and appropriate measures to secure the effective enjoyment’ of the right. In other words, non-action by the State may also constitute an unlawful interference with Art.10 ECHR.¹²⁸

In determining whether or not a positive obligation exists, regard must be had to the fair balance that has to be struck between the general interest of the community and the interests of the individual, the search for which is inherent throughout the ECHR.¹²⁹ This is fully in line with the recognition of multiple and sometimes conflicting rationales for granting the right to freedom of expression. The right to freedom of expression is believed to be crucial, both intrinsically (for the individual’s well-being) and extrinsically (with the aim of furthering and improving deliberation). Thus, the ECtHR has held many times that freedom of expression ‘constitutes one of the essential foundations of a democratic society and one of the basic conditions for its progress and for each individual’s self-fulfillment.’¹³⁰ In sum, the State has a positive duty in finding the middle way between both types of rationales underpinning Art.10 ECHR.

As the rights laid down in the ECHR are by definition fundamental, they are inherently applicable without discrimination. Thus, the ‘positive duties’-doctrine of the ECtHR is no more than a recognition that the State is obliged to ensure that there is a general equality among (legal) persons in their enjoyment of the right to freedom of expression, thus furthering the various rationales enshrined in Art.10 ECHR. This equality can be hampered by the State, but also by private individuals. To be sure, it is suggested that Art.10 ECHR entails a positive duty to prevent the ability (or potential) of certain voices to silence or inhibit competing voices. Indeed, this can be inferred from the ECtHR’s reasoning in *Plattform ‘Ärzte für das Leben’*. It was held that ‘[t]he participants must, however, be able

¹²⁶ *Leander v. Sweden*, Judgment of 26 March 1987, 9 EHRR 433, at para.74. Note that it is standing case law that these rights embodied in Art.10 can be invoked by natural and legal persons alike.

¹²⁷ L. Jaeckel, ‘The Duty to Protect Fundamental Rights in the European Community.’, 28 *European Law Review* (2003), p.524. This author also discusses the recognition of the positive duties doctrine in MS laws and at the level of the EU legal order.

¹²⁸ *Plattform ‘Ärzte für das Leben’ v. Austria*, Judgment of 21 June 1988, Series A no. 139, p. 12, para.32. The case is on the right to demonstrate (Art.11 ECHR) but the Court has applied this reasoning with respect to Art.10 ECHR, for instance, in *Özgür Gündem v. Turkey*, Judgment of 16 March 2000, at paras.43-46.

¹²⁹ See, for instance, *Özgür Gündem v. Turkey*, supra, para.43.

¹³⁰ See, for example, *Lingens v. Austria*, Judgment of 8 July 1986 (No. 103), 8 EHRR 103.

to hold the demonstration without having to fear that they will be subjected to physical violence by their opponents; such a fear would be liable to deter associations or other groups supporting common ideas or interests from openly expressing their opinions on highly controversial issues affecting the community. In a democracy the right to counter-demonstrate cannot extend to inhibiting the exercise of the right to demonstrate.¹³¹ Put differently, expression occurs in competition with other expression. If a dominant voice is left with the ability (or potential) to inhibit or silence the expression of dissenting 'information' or 'ideas', this may have adverse effects on the general interest.¹³²

It is submitted that the expression of 'information' or 'ideas' in the form of software is particularly prone to under-representation of competing modes of expression. Software programs have the effect of silencing or inhibiting competing programs. As was shown above, OS, for example, tend to quickly become dominant. This is because network effects influence both producer and end-user decisions. Users will opt for the OS which will run the highest number of, and the most popular, applications. At the same time, software application writers will write for the leading OS. Therefore, through the existence of pervasive network effects, software markets are particularly prone to 'inhibiting' or 'silencing' competing expressions of 'information' or 'ideas' in software.

To sum up, software goods and services enjoy cogent protection under Art.10(1) ECHR. First, market players have the right to freely impart these; secondly, if players want to impart them, then individuals have the corollary right to receive the software. Thirdly, in view of the characteristics of software, and in particular the existence of pervasive network effects silencing competing software expression, there may be a very strong case indeed for imposing positive duties on States.

(ii) *Software as a Means for Expression* – But software is not only expression, it is also a *medium* for imparting or receiving expression in the form of software or otherwise. This links in to the topic of media pluralism. While most national constitutional courts openly recognise the fundamental right to media pluralism,¹³³ there was some doubt as to whether this right was also enforceable at the level of the ECtHR.

Concrete support for the proposition that States have a positive, enforceable obligation to avoid media concentrations under the terms of Art.10 ECHR may be gleaned from the view of the European Commission for Human Rights (EHRCom)¹³⁴ in *De Geillustreerde Pers NV*. It was held that 'States have a duty' under Art.10 to protect against excessive press concentrations.¹³⁵ In *Verein Alternatives Lokalradio Bern* it held that 'a licensing

¹³¹ *Plattform 'Ärzte für das Leben' v. Austria*, Judgment of 21 June 1988, Series A no. 139, p. 12, para.32.

¹³² See for the 'silencing' or 'drowning-out' guiding principle of freedom of expression: O.M. Fiss, *The Irony of Free Speech*. (Cambridge Massachusetts, Harvard University Press, 1996), pp.98; T. McGonagle, 'Does the Existing Regulatory Framework for Television Apply to the New Media.', *IRIS Plus* (Strasbourg, European Audiovisual Observatory, 2001).

¹³³ See, for instance, Decision 82-141 of the French Conseil Constitutionnel of 27 July 1982 [1982] JO 2422 at 2423; Art.5 of the German Constitution (*Grundgesetz*), which specifically provides that '[t]he freedom of the press and freedom of reporting through audiovisual media shall be guaranteed'; Dec. 112/1993 of the Italian Corte Costituzionale [1993] Foro it. 1339 at 1349 or the ruling of the Spanish *Tribunal Constitucional* of 31 March 1982, JC 1982, s.160, 172.

¹³⁴ The European Commission for Human Rights was abolished a few years ago. It used to provide preliminary decisions on human rights cases within the ECHR system, and some cases were referred to the ECtHR.

¹³⁵ App. No 5178/71, *De Geillustreerde Pers NV v. Netherlands*, 8D & R5. See discussion in R. Craufurd Smith, *supra*, p.181.

system not respecting the requirements of pluralism, tolerance and broadmindedness, without which there is no democratic society' would infringe Art.10(1).¹³⁶

Some authors argued that the ECtHR never confirmed this very antiquated Commission ruling, and the emphasis was usually on preventing State interferences with the right to *impart* information or ideas.¹³⁷ Notably, often no express reference was made in rulings on media-related issues (TV, Radio, Printed press) to the right to *receive* information, while the latter is also granted by Art.10(1) ECHR in relation to the expression of information or ideas. The emphasis in the ECtHR case law is on the sender of information, not on the receiver. Consequently, it was argued, the right to media pluralism might not be all that enforceable, and that the ECHR did not appear to impose on MS a positive duty to bring about media pluralism.¹³⁸

However, other authors have pointed out that there is such a positive duty on the part of MS.¹³⁹ In *Tierfabriken*, for instance, the Court recognised that the existence of powerful financial groups in the advertising sector may curtail the freedom of expression of broadcasters. This was because it was likely to undermine the 'fundamental role' of Art.10, 'in particular where it serves to impart information and ideas of general interest, which the public is moreover entitled to receive. Such an undertaking cannot be successfully accomplished unless it is grounded in the principle of pluralism of which the State is the ultimate guarantor. This observation is especially valid in relation to audio-visual media, whose programmes are often broadcast very widely.'¹⁴⁰ Thus, one of the recognised ways to achieve media pluralism consists in preventing too large financial groups from controlling the advertising sector. In the EU, the right to media pluralism is moreover expressly recognised in Art.11 of the (non-binding but authoritative) EU Charter for Fundamental Rights.

The right to media pluralism most probably applies to software media. With the advent of digital TV, for instance, software has become an increasingly critical part of the media value chain. There is no reason why this right should not apply to the software part of the means for imparting 'information' or 'ideas', be they in the form of software or otherwise. The main problem is that we have confused media with media companies – those intermediaries who filter and select the content that viewers might be interested in. Thus we believe that media pluralism is about securing that a sufficient number of firms is involved in the imparting of *content*: we give firms a licence, or part of the means, as well as a market share cap. In this view, it is unimportant how many firms provide software for the various DTV broadcasters, since we thought we ensured that enough pluralistic content will reach the viewer. When focusing on market players, software appears to raise few issues related to media pluralism.

¹³⁶ App. No 10746/84, *Verein Alternatives Lokalradio Bern v. Switzerland*, 49D & R126. See discussion in R. Craufurd Smith, *supra*, p.181. Note that the European Commission for Human Rights, which used to precede the Court in proceedings within the ECHR legal order, was subsequently abolished.

¹³⁷ See for a recent example *Demuth v. Switzerland*, Judgment of 5 November 2002, Application No. 38743/97, available at <http://www.echr.coe.int>, at para.30. See on this case D. Voorhoof, *IRIS* 2003-1, pp.2-3.

¹³⁸ R. Craufurd Smith, '*Broadcasting Law and Fundamental Rights*.', (Clarendon Press, Oxford, 1997), pp.179-80 and 196.

¹³⁹ J. Cappiau, 'EC Must-carry Rules on the Brink of a Lost Opportunity: Harmonisation and Free Movement of TV Broadcasts within the Communications Review (Proposed Directive on Universal Service and Users' Rights).', 2 *Journal of Network Industries* (2001) 277, at p.294 (referring to *Lentia* and *Tele 1 Privatfernsehgesellschaft mbH v. Austria* (2001)); and C.A. Jones, 'Television without Frontiers', in P. Eeckhout and T. Tridimas (Eds.), *Yearbook of European Law 1999-2000*, (Oxford, Clarendon, 2000), p.306-307.

¹⁴⁰ *Verein gegen Tierfabriken v. Switzerland*, Judgment of 28 June 2001, Application No. 24699/94, para.73; referring to *Lentia*, *supra*, para.38.

However, in a context of increasing bandwidth (and potential participation) media pluralism is arguably also about the fact that the *medium* itself for information transmission (e.g. radiospectrum, cable networks) should not be controlled or determined by too few companies. Similarly, the State might incur the duty to prevent any one company from having such a stranglehold on the software part of the media value chain. In other words, if all media companies (or intermediaries) and all users are dependent on, or using, a software platform produced or controlled by one and the same company (especially software at the user end – OS, browser, applications – which are nearest to the user’s eyeball and eardrum), is this not just as worrisome from the point of view of media pluralism?

This brings us to a fundamental problem in regulating digital media. On the one hand, software goods/services themselves tend to dominance. This is because software is characterised by huge network effects (first mover advantage and bandwagon or tipping effect). Some economists argue that dominance in software markets is not as big a problem since even entrenched market players would just as quickly be displaced if a superior alternative came along. Thus, they argue, we need not be as wary of large market power as in classic markets – in fact, seeking this short-lived dominance is the main incentive for innovating in those markets.¹⁴¹ On the other hand, large market shares are *in themselves* often in contradiction with the right to media pluralism. Media pluralism is about precluding the mere potential to overly influence society – no evidence of abuse of that potential or dominant position is needed (as would, in contrast, be necessary in competition law). This is logical since there are no parameters for measuring a lack of media pluralism and abuses are increasingly in the form of subtle influences on opinion-formation rather than obvious and open propaganda.¹⁴²

To sum up, the power itself to exercise influence (i.e. ‘power on content’ rather than ‘power on prices’) is the central focus of media pluralism. Power on prices will often go together with power on content. It is often argued that in the software segment power on prices raises fewer competition problems due to specific economic characteristics of that industry. Thus, the application of the right to media pluralism in software markets is highly likely to develop on a series of head-on collisions with economic regulation, more so than is the case with classic communications ‘infrastructure.’

The bottom line is that, while the right to media pluralism enjoys growing recognition at the European level, it remains to be seen how it will be applied as regards the software medium. Intricate questions arise concerning the nature of the remedies to be imposed for countering media concentration. In the broadcasting field, for instance, usual remedies include content regulation and must-carry rules. At the same time, it is sensed that the right to media pluralism in the software segment relates to the above-depicted positive duties to impart information and ideas in the form of software (and otherwise). Again, some of the underlying issues may relate to access to interfaces. Ensuring third party access to critical interfaces might go some way towards alleviating concerns regarding media pluralism.

C. Justifications

There are thus virtually no limitations on the scope of Art.10(1), but every State measure (or the lack of measures) nevertheless requires justification. To a very large extent, the law

¹⁴¹ See for instance, D. Evans, R. Schmalensee in *Did Microsoft Harm Consumers? Two Opposing Views* (AEI Brookings Joint Center on Regulation).

¹⁴² See J. Cavallin, ‘European Policies and Regulations on Media Concentration.’, *International Journal of Communications Law and Policy* (1998), at p.4; available at http://www.digital-law.net/IJCLP/1_1998/ijclp_webdoc_3_1_1998.html ; for an article emphasising the importance to reassess freedom of speech in its new setting in a time of confusion: J.M. Balkin, ‘Digital Speech and Democratic Culture: A Theory of Freedom of Expression for the Information Society.’, p.72 (forthcoming in *NYU Law Review*, 2004); available at <http://papers.ssrn.com>

of free expression under the ECHR is the law of Art.10(2). It is hard to predict which measures would be considered 'reasonable and appropriate measures to secure the effective enjoyment of the right.' Surely, the principle of effectiveness applies. The convention does not protect rights that are illusory or theoretical, but rights that are practical and effective.¹⁴³ Thus, one should assess whether third parties' rights to express ideas or information in the form of software are protected in practice, having regard to the particular circumstances of the software industry.

Whether the measures opted for are considered appropriate will depend on a careful assessment of whether it is justifiable, following a three-step test. First, the measures need to be 'prescribed by law'; second, they need to be taken with the aim of achieving a 'legitimate purpose'; third, they need to be 'necessary in a democratic society'.

The two first conditions of the test are probably easily satisfied for software. Indeed, State measures taken in execution of the Software Directive, as well as competition law provisions, are clearly 'prescribed by law'. Namely, public interest and competition laws are accessible to everyone, and they are sufficiently precisely formulated.¹⁴⁴ Furthermore, there appears to be a 'legitimate aim' to these regulations. Software legislation is most probably enacted 'for the protection of the rights of others'. In effect, this phrase has been construed very broadly, certainly including the rights protected under copyright.¹⁴⁵ Thus, the State enforces software copyrights against infringing expressions in the form of software in order to protect the rights of the software copyright holders, and at the same time the rights of end-users to receive software expression ('the others'). That is, a general obligation to disclose interface information would probably result in fewer investments in software expression.

As regards the third condition, the ECtHR has taken the position that the exceptions to Art.10 ECHR 'must be narrowly interpreted and the necessity for any restriction must be convincingly established.'¹⁴⁶ Whether measures are considered 'necessary' or, in other words, 'correspond to a pressing social need' in the sense of Art.10(2) depends on various factors.¹⁴⁷ More particularly, the ECtHR determines whether the reasons adduced by the State in question to justify the interference are 'justified and relevant', and whether the interference is 'proportionate to the legitimate aim pursued. A measure will be proportionate to the intended aim provided the latter objective could not be achieved by less restrictive means. Likewise, a measure will not satisfy the proportionality test if it is unsuitable for achieving the legitimate objective.

The proportionality test seems to imply the two following points: (i) As was discussed previously, the two regulatory tools for software expression influence one another to a large extent; moreover, as both of these have a common constitutional mandate, it was suggested that public interest regulation should complement competition law by fulfilling those policy objectives which competition law was not designed to deal with. At this stage, it appears that the main determining factor for drawing that boundary between the two regulatory realms is in fact the proportionality test in Art.10 ECHR. Specifically, the courts ought to ask themselves whether the regulatory solution adopted constitutes the least restrictive means for achieving the end set forth.

¹⁴³ A. Nicol, Andrew, G. Millar and A. Sharland, *supra*, at p.11; applied in *Artico v Italy* (1980) EHRR 1 at para.33.

¹⁴⁴ For a discussion of what this condition entails, see *Sunday Times v. United Kingdom*, 2 EHRR 245 (1979), para.49.

¹⁴⁵ B. Hugenholtz, *supra*, p.5.

¹⁴⁶ *The Observer and The Guardian v. UK*, Judgment of 26 November 1991, A.216, p.30.

¹⁴⁷ 'Necessary' would not be synonymous with 'indispensable', but more is required than merely being 'useful', 'reasonable' or 'desirable' (*Handyside v. United Kingdom*, Judgment of 7 December 1976 (No.24), 1 EHRR 737, at para.48).

(ii) No doubt, more research is needed on the precise application of the proportionality test across the board, both for the ECtHR and the ECJ. One extremely relevant case is for instance *Tierfabriken*. In that case, a commercial of an association for the protection of animals was prevented from being broadcast because of its 'clear political character'. The association invoked its right under Art.10 ECHR. The ECtHR used a very strict proportionality test. More particularly, it persuasively ruled that a prohibition 'which applies only to certain media, and not to others, does not appear to be of a particularly pressing nature.'¹⁴⁸ As a result, States should be careful when introducing radically different treatments between the various media. As explained above, software has a dual nature: medium and expression. Thus, one might argue that the right to media pluralism applies. By analogy, the question then arises whether it is proportionate to impose markedly differing legal conditions on the software layer in the media value chain (particularly at the user end). As regards all other means for transmitting 'information' or 'ideas' public interest regulation seeks to complement competition laws, particularly when it comes to preventing discrimination, thus resulting in the adoption of different rules for circumstances judged different (e.g. must-carry rules, content regulations, concentration rules, etc.).¹⁴⁹ Is it proportionate to impose on all software providers the same 'access' price for the obtaining of critical software interfaces? Given its critical importance, this issue will need to be looked at more closely.¹⁵⁰

D. Margin of Appreciation

The final element for assessing whether a State measure is 'necessary' to achieve certain interests, is the concept of 'margin of appreciation'. The margin of appreciation is generally broader for States in commercial matters. 'Otherwise the [ECtHR] would have to undertake a re-examination of the facts and all the circumstances of each case. The [ECtHR] must confine its review to the question whether the measures taken on the national level are justifiable in principle and proportionate.' It is logical that the margin be broader in commercial matters since the regulation of commercial expression arguably poses less of a threat to the 'democracy rationale' underpinning Art.10 ECHR. Moreover, the ECtHR is in a poor position to evaluate decisions in such a highly complex and fluctuating area.¹⁵¹ By contrast, an interesting consequence under the ECHR of holding the imparting of 'information' or 'ideas' to constitute political (or at least public interest) expression is that the State's margin of appreciation to restrict that particular expression is much narrower if it still exists at all. By the same token, however, it is often not at all clear when a statement should be designated as 'commercial' rather than 'political'.¹⁵²

It has been argued that software code is not about making a point, particularly not a political one.¹⁵³ This is very unconvincing a statement. The *Bernstein* and *Reimerdes* lines

¹⁴⁸ *Verein gegen Tierfabriken v. Switzerland*, supra, at para.74.

¹⁴⁹ See for broad considerations on the broadcast media and 'free speech' in digital: J.M. Balkin, 'Digital Speech and Democratic Culture: A Theory of Freedom of Expression for the Information Society.', p.39 (forthcoming in *NYU Law Review*, 2004); available at <http://papers.ssrn.com>

¹⁵⁰ One possible solution might be the introduction of a reciprocity requirement. Thus, one may argue that it makes no sense to ask from non-commercial providers the same access price as for competing commercial players. See for such an argument E. Moglen, 'Tunney Filing of the Free Software Foundation in *United States v. Microsoft*.' (2002), p.2; available at <http://emoglen.law.columbia.edu>.

¹⁵¹ See *Markt Intern and Beermann v. Germany*, supra, at para.33.

¹⁵² See for instance, in *Barthold* a veterinary was enjoined under the unfair competition Act from repeating statements in the press concerning the provision of night services at his own clinic and suggestions for the establishment of a regular night service. The interview was accompanied by the applicant's picture and name, as well as the name of the clinic. The ECtHR considered the restricted publication a normal press interview, not commercial advertising. *Barthold v. Germany*, Judgment of 25 March 1985, A.90, pp.25-26.

¹⁵³ K.A. Moerke, 'Free Speech to a Machine? Encryption Software Source Code is Not Constitutionally Protected "Speech" Under the First Amendment.', 84 *Minnesota Law Review* 1007, p.1029.

of case law in the US, for example, were heavily political. In the former, it was about the right of citizens to interact in complete privacy, through the wide availability of encryption technology. In the latter, it was a clear political dissent, claiming the right we all have to learn how technology works.¹⁵⁴ Today the form of software itself implies a political stance. When Microsoft sells software in object code form and prohibiting the viewing of the source code, it is saying, “don’t read the software even if you can.”¹⁵⁵ Diametrically opposed to this stands the ‘open source’ movement. This group of software developers, linked through the Internet and working by thousands on a large series of software projects, are disseminating software products which operate on the General Public Licence (GPL) model. GPL denotes the fact that everyone is free to copy, disseminate and change the said software, provided that he/she will not proprietise it. These actions are made possible through the dissemination of the ‘object’ code together with the ‘source’ code of the software. Software, whether open or closed, is more than just bits and bytes. It determines which programs can be run, it empowers some speakers and can exclude others, and helps to determine a specific society’s culture.¹⁵⁶

To be sure, the power to construct and control channels of communication through law is a most serious *political* question in the digital era. On one side the school of thought that believes information as the basic building block of knowledge should (and wants to) be free. On the other side stands the idea that in a market economy, value added to raw information has been and inevitably will be commodified and sold in the market.¹⁵⁷ The fierce debate over open versus proprietary code is intimately connected with this construction of identity through software.¹⁵⁸ In sum, it is suggested that the State’s margin of appreciation in the context of Art.10 ECHR is very narrow when regulating software, since the debate is clearly political.

V. Conclusion

In this paper the issue of software regulation is approached from the viewpoint of fundamental rights. Specifically, in a digital communications environment the question arises whether European software laws comply with the constitutional right to freedom of expression (Art.10 ECHR). In order to show the relevance of such an approach, the paper focuses on software interoperability, and tests the various applicable laws against the backdrop of Art.10 ECHR. Software interoperation depends on access to the ‘interface’, a set of electronic keys which, so far as structure is concerned, must be precisely emulated, in order to secure co-operation between programs.

At first sight, software interoperability appears to raise few fundamental rights problems. That is, the two applicable bodies of law seem to complement each other well, and appear to strike a fair balance for digital expression. Under the European Software Directive, copyright holders are granted a strong legal backing for determining who is to produce programs which are interoperable with theirs. Thus, even the arduous task of reverse engineering is limited to licencees of the copyright holder and in limited circumstances. However, this is generally not considered a problem since it is also in the

¹⁵⁴ R.C. Fox, ‘Old Law and New technology: The Problem of Computer Code and the First Amendment.’, 49 *UCLA Law Review* 871, p.896.

¹⁵⁵ L. Tien, ‘Publishing Software as a Speech Act.’, 15 *Berkeley Technology Law Journal* (2000), p.19; available at http://www.law.berkeley.edu/journals/btlj/articles/15_2/tien/tien.html.

¹⁵⁶ See E. Moglen, ‘Anarchism Triumphant: Free Software and the Death of Copyright.’, <http://moglen.law.columbia.edu>.

¹⁵⁷ B. Fitzgerald, *supra*, p.339-340.

¹⁵⁸ Of course, it does not matter whether the object code is intelligible or not to everyone. The right to freedom of expression protects the dissemination of *ideas*. The political idea behind running open or closed software can be understood – indeed, it might even be the most convincing manner for expressing certain ideas.

copyright holder's interest to have programs interoperate with hers, and consequently she will normally disclose relevant interface information. At the same time, it is generally believed that competition law – more specifically Art.82 prohibiting the abuse of a dominant position – is sufficient for redressing possible market failures relating to interoperability. The article shows how previous case law indicates a rather easy finding of dominance in similar cases. Competition authorities are then empowered to prevent abuses of dominant market players in the form of discriminations, refusals to supply, leveraging of market power to adjacent markets, and the like. In sum, although there is virtually no case law on the application of Art.82 in relation to software products/services, the underlying assumption of the current regulatory framework is that competition law is well-equipped to force interface disclosure in the few cases where this would be necessary.

However, it is submitted that this is misconceived. The text reviews and briefly explains classic economic theories on vertical integration and network effects, and concludes that one may question the automatic willingness of copyright holders to disclose interface information – thus rendering third party expression more difficult. An analogy is drawn with design rights issues to show the critical strategic role of interfaces, and the power these confer on those market players controlling them. It is contended that the distinctive feature of the software value chain is its extremely modular character, which means that specific functions are not fixed at distinct stages or market segments. Moreover, like with modular lego blocks there are important two-way effects associated with software interfaces; thus, opening up interfaces may possibly cause the copyright holder to lose market shares at both stages around the interface, not just one. In sum, one should be wary of concluding – as public interest regulation does – that software interface disclosure is automatic and easy; new economic theories are currently being discussed which would shed more light on these issues.

Likewise, competition law is not fully capable of redressing the above. Not only is there an understandable caution to force access to essential facilities; but bottleneck facilities are moreover the paradigmatic example of a situation in which classic competition law methodology may need to be stretched beyond recognition, if it is to be applied. Thus, in order to find dominance relevant markets may need to be defined for products/services in which there is no actual trade; the main competitive concern is shifted from dominance to essentiality; and remedies have to be fashioned from scratch rather than on the basis of existing market transactions. More fundamentally, competition law is simply unable to legitimately cope with a number of pressing policy concerns; among them we find the concepts of property rights, and the right to non-discrimination. Only in exceptional circumstances should competition law effect the baseline concept of property enacted by the legislator; and rarely will competition law be a viable solution in a situation in which the discrimination consists in charging two market players the same access fee, where the circumstances would have required the dominant player in question to ask different prices. Simply, competition law cannot account for this type of wider societal policy choices.

The point is that neither of the tools which constitute the current legal arsenal fulfils its role well enough. Software interoperability regulation is built on questionable assumptions. Third party access to essential software interfaces is not as automatic or straightforward as generally thought, and competition law is inadequate to play its complementary role of securing such access in the presence of market power. Failing any one of these essentially complementary assumptions, the whole regulatory construction collapses irremediably.

The thread through this paper is the understanding that the exact mix between public interest regulation and competition law cannot be assessed in a vacuum, but rather depends on the constitutional constraints imposed *inter alia* by Art.10 ECHR. Likewise, public interest regulation should complement competition law in the fulfilment of common overarching constitutional goals. To this end, the paper evidences software's dual role, and

claims that software regulation not only raises economic, but equally and foremost constitutional questions which will no doubt soon be raised in European courts. (i) Software is a *means* (or medium) for expression, but (ii) software is equally expression *in itself* and falls within the ambit of Art.10 ECHR.

(i) The expressive nature of software, or the fact that some ideas (commercial, political or otherwise) are best expressed in the form of software (e.g. Linux) primarily means that individuals have the right to freely impart *and receive* information and ideas in the form of software. Crucially, the State also incurs a *positive* duty to facilitate their being imparted and/or received (*Plattform* case). The State's role in this respect is no different from its role in relation to other expressions of 'information' or 'ideas.' It is generally entrusted with the task of striking a fair balance between allowing for individual self-fulfillment, and furthering the other rationale embedded in Art.10 ECHR: accommodating and improving deliberation between the various expressions of 'information' or 'ideas.' This task is carried out by the State through compliance with the general principle of non-interference, but also through appropriate and tailored interventions, in execution of its positive duty. That is to say, the State needs to ensure that the ability (or potential) of certain modes of expression in software to inhibit or silence other expression is reduced to the minimum, so that the flow of 'information' or 'ideas' is hindered minimally. The latter point is particularly relevant when considering that software is characterised by pervasive network effects, which may have a substantial 'silencing' effect on software expression.

(ii) At the same time, software might also be scrutinised in the light of the individual right to media pluralism, which is related to the positive duties doctrine. It is argued that, in the light of an ever-increasing potential to participate in the imparting of ideas or information, the focus of media pluralism will gradually shift: from ensuring participation of a minimum number of media *firms* or intermediaries, to preventing that the *means* or media (including software) be controlled by too few firms. In this optique, there is no fundamental difference between the radiospectrum, cable networks, or end-user software platforms. But the right to media pluralism is confronted with a fundamental difficulty: because of its particular economic characteristics software products/services tend to dominance (e.g. network effects), but this dominance (power over prices) is *in itself* often in conflict with the right to media pluralism (power over content). Media pluralism is about preventing the *potential* to abuse media power. Abuses of media power are so subtle, and parameters for measuring media pluralism so hard to implement, that media law in fact tends to focus on preventing dominance instead of the abuse of that dominance (e.g. through the imposition of market share caps). In sum, while the right to media pluralism enjoys growing recognition at the European level, it remains to be seen how it will be applied as regards the software medium, where severe clashes are to be expected for the above reasons.

Although the relevance of the above should be clear by now, the most difficult tasks remain to be tackled. The outcome of legal proceedings on this issue would eventually hinge on the application of Art.10(2) – regarding the justification of measures (or the lack of these) restricting expression. In particular, it is critical that the State's measures be proportionate to the intended goal; that is, the least restrictive means for achieving software interoperability. This is also the main determining factor for drawing that boundary between competition law and public interest regulation. In particular, State measures might take various forms, such as differential treatment between parties judged to be in different circumstances (cf. must-carry rules in broadcasting), timely public release of relevant interface information, or standardisation of crucial interfaces (e.g. current debates on the standard API for interactive TV – the Multimedia Home Platform (MHP)). An important element in this balancing exercise is no doubt the fact that the court's assessment might not leave the State any margin of appreciation. Indeed, in light of the current political battle

between two diametrically opposed views on the role of software (closed commercial v. free open source software), the issue should certainly be considered 'political expression' deserving tight scrutiny.

The latter point clarifies the importance of the constitutional approach: access is more likely to be granted to software expression which is built on the same fundamental beliefs; conversely, interfaces are unlikely to be disclosed to fundamentally antithetical software expression since the latter expression challenges the incumbent's whole paradigm, not just its dominance. This issue cannot be solved having regard only to economic rationales. It is time to launch a European debate on this issue: let us analyse software regulation from an Art.10 ECHR perspective. To this end, more research is needed, *inter alia* on the concrete application of the proportionality-test; software and media pluralism; the wider implications of Art.10 ECHR for software copyrights (and patents), beyond interoperability; and fundamental rights in the EU legal order.¹⁵⁹

¹⁵⁹ Indeed, there is some difference with the ECtHR, especially as regards the underdeveloped positive duties doctrine in the EU legal order: L. Jaeckel, 'The Duty to Protect Fundamental Rights in the European Community.', 28 *European Law Review* (2003), pp.508-527.