

**IPR and “open creativity”:
The cases of videogames and of the music industry**

Laurent Bach¹ *, Patrick Cohendet², Julien Pénin³, Laurent Simon⁴

Corresponding author: Laurent Bach
BETA – University Louis Pasteur and CNRS
61 avenue de la Forêt Noire
67085 Strasbourg Cedex
bach@cournot.u-strasbg.fr

Very preliminary draft

1. Introduction

When compared with the analysis of the formation and use of IPR in traditional industries, the examination of IPR in creative industries highlights some very specific traits:

In traditional industries, the economic theoretical approach focuses on the determination of property rights as a means of protecting innovative efforts in a *given* firm. The fact that many individuals within the firm have participated in the innovative process does not really matter since they are supposed to be employees of the firm: the firm is analysed as a representative agent that will claim the property right in its entirety. Rewarding the individuals within the firm who contributed the most to the innovative process is a distinct and different issue, which is generally treated through incentive mechanisms such as stock options or other financial rewards. A second characteristic of the traditional approach is that the analysis focuses on the sole universe of applied research (within a given firm). What “happened before”, that is the emergence of new ideas, is the concern of a related but distinct universe: the world of *open science*. The latter is governed by different reward mechanisms such as publication, peer recognition, etc. Of course, the interactions between the two universes, the domain of open science and the one of applied research, are complex and have justified an intense in-depth analysis by economists (Foray; 2004; David, 2006; etc.). However, whatever the analysis, one must emphasise that the related universes are clearly regulated with well identified and specific institutions.

¹ BETA, Université Louis Pasteur Strasbourg, UMR CNRS 7522

² BETA, Université Louis Pasteur Strasbourg, UMR CNRS 7522, and HEC Montréal, Canada.

³ BETA, Université Louis Pasteur Strasbourg, UMR CNRS 7522

⁴ HEC Montréal, Canada

In creative industries, the process of creation is generally a collective effort that necessitates the interaction and coordination of a multitude of heterogeneous economic actors: When looking, at the end of a movie, to the acknowledgements to people who participated in this creative product, the collective nature of the project is obvious. In the same vein, the production of a videogame requires the participation of hundred, sometimes thousand of different contributors: artists, musicians, game designers, etc. Of course, in the domains of film making as well as in the domain of videogames or music performance, some large (major) companies have emerged and they tend to concentrate (as in traditional industries) all the property rights related to their creative products. However, their position is fragile: in particular, the technological revolution in information technologies constantly redistributes the mode of production of creative products and reshuffles relationships between creative ideas and the tangible objects in which they are fixed (Andersen, 2008). Basically, stakeholders of the creative process are communities of creators, single individuals and firms. While in traditional industries the determination of IPR is viewed through a focussed angle, in creative industries it has to be examined as a fundamentally *dispersed* phenomenon. The second characteristic of the analysis of IPR in creative industries is that the creative firms are not backed by a regulated and institutionalized universe which could be compared to the *open science*. What is called *underground* may represent this informal universe where creative ideas emerge and develop, but contrary to the world of science, it is not organized and institutionalized with specific norms and rules.

In this contribution we precisely argue that one of the roles of IPR in creative activities is to contribute to organizing and regulating a fertile and informal world of “open creativity”. We consider that creative firms have a deep interest to “invest and pay” for the existence of the informal universe. Not only cannot a movie company employ all the artists, designers, musicians, composers, etc., it needs, but even if it could this is not in its interest, since it must probably pay for these artists and other creative people to cultivate and enhance their creative potential within their communities of origin, rather than within the walls of a large company. Creative projects entail integrating, cutting and pasting, assembling creative elements dispersed among a vast array of technical and cultural activities carried out by diverse and distinct actors.

This collective organisation of creativity raises new questions: A first paradox has been identified by Cohendet and Simon (2007), who raise the issue of the compatibility between traditional rules of corporate governance and creative communities. In short, is it possible to manage and drive creative communities without sterilising them? Management in creative industries “is the result of a delicate balance. On the one side, there is an artistic mode relying on flexible and decentralised expertise held by distinct creative communities of specialists; on the other side, is a strict managerial attitude looking for the advantages of tight integration of these activities within time, cost and market constraints. The need to fine tune the level of integration in such an industry is high: too strong an integration could lead to permanent reduction in diversity and creativity; too loose an integration could lead to divergence, chaos and inefficiencies” (Cohendet and Simon, 2007, p. 588).

This paper deals with a second paradox: How can we reconcile the different wants and needs of three basic stakeholders having contradictory interests: firms, individuals, and creative communities. Basically, we argue that individuals desire strong individual IPR, firms aim at strong “corporate” IPR, whereas creative communities require weak IPR in order to easily use and recombine existing art, which is the raw material of the activity of creation. These

different logics that drive individuals, firms and communities are therefore often in conflict. This implies to rethink the way IPR are used in creative industries.

In this perspective, the present contribution analyses how IPR are determined in creative processes by selecting two creative industries (music industry and video games). The focus will be on explaining why different actors may need different kinds of IPR regimes. We also propose a framework to explain the differences of IPR regimes in creative industries. Basically, we propose that the more the sector is dominated by communities, the weaker the IPR regime and the more the sector is dominated by firms and single individuals, the stronger the IPR regimes.

In the case of music, the paper will propose a more exploratory analysis, given the existence of many different types of music and associated specific creative processes. In our perspective, we assume that the first innovation phase can be interpreted as the emergence of a *music style*. The role of IPR will be investigated taking into account the extremely complex architecture of rights, their ability to cover various specific aspects of musical creation, and the correspondingly intricate network of connections between the actors involved at different stages of the creative process (composers, songwriters, musicians, recording personal, producers, agents, editors, labels, majors, etc but also to some extent entertainment industry, music instruments industry, etc). It will also be argued that the impact of digitalisation has probably a more pervasive and diverse influence on the economy of the music industry than the traditionally reported (and debated) eviction of CD sales by illegal internet downloading. One of the consequences is the increasing variety of communities, for instance based on the Creative Commons principle.

In the case of videogames, the analysis will extensively rely on the deep knowledge of the development around the Canadian-based Ubisoft company, where one of the co-authors of the proposed contribution has spent three years for his Ph.D. All videogames, regardless of their type, content, country of origin, target platform or supporting media, comprise some combination of copyrights, trademarks, patented technology and trade secrets, each owned by many different parties. The IP "ingredients" or assets in a game generally fall into basic categories: code, art, audio, and design. Within each category, some assets are created "from scratch" while others are licensed from others, whether for reasons of efficiency or publicity. The individual assets may be protected by copyrights, trademarks, patents, trade secrets, or some combination of the above. Our contribution aims at explaining how the IPR system is logically distributed through the different participants in the creative process (this includes recent "hot" debates such as developer-publisher as author). This analysis includes the role of creative communities, since IPR in community based videogames (raising issues such as the use of creative commons) is a growing tendency in the domain.

The paper contains four sections. First, we present the dynamics of creativity that is the outcome of the interactions among three types of actors: individuals, firms and communities. Then, in section 3 we introduce the IPR dilemma in creative industries. How can we reconcile the different IPR needs of each actor involved in the creation process? Sections 4 and 5 display respectively the cases of the music (studied in details) and the video-game industries (summarizing and adding to Cohendet and Simon, 2007). These two cases present similarities in the sense that they do not involve a dominant player. Individuals, firms and communities all play an important role, which may trigger specific need in terms of IPR.

2. The dynamics of creation between individuals, firms and knowing communities.

If one agrees with the fact that creativity is “*the ability to transcend traditional ideas, rules, patterns, relationships, or the like, and to create meaningful new ideas, forms, methods, interpretations*” (Webster’s definition), one must admit that creativity can only emerge through interactions and exchanges among as many and as different as possible social entities. It is only through such a complex and interactive process that existing ideas and materials can be enriched and combined to give birth to radically new trends, styles and fashions.

In particular, the process of creation in most creative industries should not be restricted to the sole role of talented individuals, or to the sole control of the strategic vision of institutions (such as firms or labs in standard industries). We consider that institutions are structures where contracts are signed, where people are hired or fired, where broad competences are managed. They are not the active units of elaboration of this common base indispensable for the development of creation. Firms are necessary to put new creations on the market, to organise their mass production and distribution. They can manage during a certain time to introduce novelties on the market. But they cannot bring continuously radical new things on the market. To remain at the forefront of creation firms must rely on elements that are located outside the frontiers of the firm. In the same vein, we also consider that the activity of creation should not be reduced to the sole work of some rare genius. Although relevant in some cases, this traditional picture does not reflect the complexity of the creative act. If a new piece of art very often comes from one single creator, the process that has led to this creation is unambiguously a collective process. Creation is the outcome of the interaction among many heterogeneous individuals, and the richer the interaction, the more fruitful the creative process. To underline only the individual who is at the end of this chain of creation is equivalent to missing the most important and interesting part of the story.

For these reasons, our view is that we need to introduce in the analysis of the creative process the role of *creative communities*: the locus of creation is rooted within the diverse “underground” communities, with which firms and individuals must somehow maintain links in order to keep introducing novelties. By *creative communities*, we refer here to informal group of individuals who accept to exchange voluntarily and on a regular basis to create knowledge in a given field. This can be assimilated to “epistemic” communities (Cowan *et al.*, 2000) in the academic literature which underlines the increasing role of these communities in society. As the knowledge-based economy expands, such communities are playing an increasing role, because they can take charge of some significant parts of the *sunk costs* associated with the process of generation or accumulation of specialized parcels of knowledge. These costs correspond for instance to the progressive construction of languages and models of action (a “grammar”) and interpretation that are required for the implementation of new knowledge, that cannot be covered through the classical signals of hierarchies (or markets). This setting is likely to compensate for some organizational limitations (learning failures) that firms are facing when confronted with the need to continuously innovate and produce new knowledge.

Creative communities are the main social constructions from which a common grammar emerges. By progressively codifying the available knowledge, these communities provide the necessary cognitive platform to make creative material economically viable. As a result, these communities are the main places for the accumulation of innovative micro-ideas, which may be potential sources of future creativity. They are the main constituents of the “underground”

from which creative industries extract their innovative efforts. In order to be widely diffused, creative ideas must then rely on the interaction between different communities, as suggested by the translation/enrolment principle (Callon and Latour, 1991). In fact, each community must draw the attention of and convince other communities of the value of their creation. This is not achieved without difficulty, as talented individuals are not always well understood and sometimes have a hard time persuading others of the validity of their activity. This is the reason why the first stages in the creative process may be fairly long and complicated. However, once the construction of a common knowledge base is realized and the system is percolated (Willinger and Zuscovitch, 1988), the creative process accelerates. The novelty can then become a potentially viable economic application that may enter the market for creative goods

The main (and indispensable) role of creative communities is thus to codify and equip creative ideas with common norms and principles. In this sense, formal collectives rely on the work of informal communities, as it is impossible for them to allocate the sufficient amount of time necessary for creative material to blossom, and because the cost constraint is often incompatible with the constant need to nourish new ideas with past experiences. Once a codebook is implemented, creativity can be assimilated to a quasi-public good. The language being perfectly stabilized, and the procedures being easily replicated, market opportunities can become predictable. The creation will therefore be economically identified. In this context, knowledge will no longer be tacit, but on the contrary will be treated as information, as a pure public good. Imitation can therefore easily take place without any compensation for the producers of the novelty.

We thus propose to interpret the creative activity as a collective process, in which various social forms (the individual, knowledge communities and organizations) frequently interact with one another, each one of them complementing the work of others, and correcting the eventual failures of other social forms. This capacity to combine the different elements of creativity following its development stage is essential. In fact, this is where the quality of the network linking the different social entities is decisive, by allowing them to efficiently allocate, support, associate and renew creative ideas. No single economic device could achieve this alone. The power of the creative process requires that new ideas be appropriated, reinterpreted and enriched by their transfer to other economic entities, which is exactly what the network guarantees.

3. IPR dilemma in creative industries: IPR to exclude vs. IPR to prevent exclusion (permission world vs. open world).

The multiplicity of stakeholders in the process of creation suggests that the different parties involved should be rewarded with a complex bundle of diverse IPR, not with a single IPR device. For instance, in the case of the video game industry, IDGA (2003) underlines that: “all games, regardless of their type, content, country of origin, target platform or supporting media, comprise some combination of copyrights, trademarks, patented technology and trade secrets. A finished game often contains many different intellectual properties, owned by many different parties. Within each category, some assets are created "from scratch" while others are licensed from others, whether for reasons of efficiency or publicity”.

However, IP in creative ventures also reflects the dynamics of creativity that has just been exposed as the result of a delicate balance between firms, individuals and communities. More

precisely two antagonist forces are opposed: On the one side, all the instruments that intend to protect authors and creators by restricting the access to their creation (copyrights, trademarks, patents and trade secret), on the other side, all the instruments designed to keep the artwork open, to make it available to all (copyleft, creative commons, etc.), in particular to assure the indispensable functioning of creative communities. The tensions between these two opposed forces are intense and tend to be aggravated by the evolution of ICT. As an example, in December 2006, in the Billboard magazine, Michael Suskind, a member of the International Association of Entertainment lawyers (IAEL) wrote: “A copyright theory called Creative Commons promoted by an organisation of copyright practitioners and academics, has emerged as a serious threat to the entertainment industry”. To better assess the potential conflicts at stake, we describe in the following the two main types of IP instruments:

a) *IPR to exclude:*

The main IP instruments to exclude are the classical ones: copyrights, trademarks, patents, trade secrets, or some combination of the above.

Copyright is probably the most common IPR used in creative industries since, contrary to patents that are more industry oriented (but that start to intervene in creative industries, see below), their primary goal is to protect artistic creation, either a song, a book, or a computer program, etc. Anything that can be fixed in a tangible medium can be the subject of copyright. An item, once copyrighted, cannot be copied without permission of the owner. For instance, a copyrighted book cannot be printed or a copyrighted song cannot (or should not) be downloaded without the permission of the owner. It is therefore easy to understand the importance of copyright in order to ensure remuneration to creators. Without copyright, and this is especially true at the digital era, consumers could enjoy art almost for free, which would not induce the production of new pieces of arts. Yet, copyright does not protect an idea in itself but only the expression of the idea. For instance, in the case of a book that describes a specific story, the copyright does not protect the story in itself but only the way in which it is described in the book. Anybody can write another book using the same story, provided that it is described in another manner, with another literary style, etc.

A *trademark* protects any distinctive sign that enables consumers to differentiate among products. In creative industries they concern the name of the creator, the name of the product, logos, etc. Trademarks are therefore essential devices to market a product, either in creative or in more traditional industries. It is the trademark that will allow consumers to differentiate between genuine products and mere counterfeits. Yet, before the marketing stage, during the conception, design and production of a piece of art, it is unclear whether trademarks play any important role.

In the past, *patents* did not play a major role in creative industries, since in most countries an invention must have an industrial application in order to be patentable. Patents were therefore designed to protect inventions in industry whereas copyrights were designed to protect pure works of art with no industrial application. The main difference with copyrights is that patents do protect the application of an idea and not only its expression. In case of software, for instance, patents protect the functionalities (what the software does) while copyrights protect the code source (the way it is written). A software, although copyrighted, can therefore be imitated by another software that would reproduce the same functionalities but with a different source code. Another difference is that patents are usually much more expensive to get than copyrights. More and more often - and this trend may be reinforced by the

digitalisation of arts patents concern creative industries. Software, algorithms, electronic devices, etc., are now widely patented.

Finally a last IPR that can grant protection to creators of pieces of art is *trade secret*. A piece of work is protected by trade secret laws when the creator does not release his/her work to the general public (no disclosure, no sales, etc.) and when he takes some measures to prevent the disclosure. In industry, it has been shown that trade secrets are mostly relevant for process innovation and not for product innovation which, by definition, cannot be kept secret. It is therefore likely that trade secret is not really relevant in creative industries, where most pieces of art are products intended to be released. Yet, all that is concerned by the way creators are creating, their techniques, etc., may be subject of trade secret, thus reducing the diffusion of good practices among the communities of creators.

b) *IPR to prevent exclusion (permission world vs. open world)*

There are two main ways of using IP to prevent exclusion: First it can be done by releasing the piece of art without any IPR on it. Second, it can be done by using IPR in a specific way, in a copyleft style. This second possibility has the advantage of controlling the use of the released work and therefore of ensuring the preservation of its freedom. By doing a “legal jujitsu” (Benkler, 2006), authors can use copyrights or patents to ensure that nobody can appropriate either their work in itself, or the improvements or modifications of this work.

This original use of IPR finds its roots in the software industry where, in reaction to a surge of appropriation through copyrights and patents at the end of the 70es, communities of developers founded the free software or open source software movement (Lessig, 2001; Dalle and Jullien, 2002; Lerner and Tirole, 2002). The purpose of these communities was to preserve the freedom to software source code, so that everybody could access this source code and modify and improve software without having to ask for permission from an “owner”. To preserve the openness of source code was considered as highly important since it was a necessary condition to favour collaborations and interactions among software developers, i.e. to create and develop software on a bazaar mode (Raymond, 1998). An important lesson that can be learnt from the software story, and on which we will come back later, is the opposition among communities of developers, who require software to be free in order to continuously build on them, and corporations, such as Microsoft or Apple, that rely on strong IPR in order to protect their software. The bazaar vs. the cathedral mode of creation, as it was analysed by Raymond, is also something from which creative industries can learn.

At first sight it may not be clear why creators would copyleft their work or would give up some of their rights, i.e. would renounce direct monetary gains resulting from their creation. On this issue, one can make four remarks: First point, it must be noticed that technically, a piece of art “protected” by a copyleft is not automatically free. It can be sold. Yet, the copyleft means that nobody can prevent someone from distributing it for free, which undermines seriously the incentives to sell it. In practice therefore, copylefted pieces of art are usually distributed for free. Second point, creators by copylefting their creation do not usually abandon all their rights over it. Very often they keep at least their name associated to their creation. It is the case, for instance, under the label *creative commons*, which proposes some more or less permissive licences but under which it is always very important to mention the name of the creator. Third point, the example of software has shown that incentives are complex in the case of artists and developers. Artists do not do art only with the objective of making money. Usually, if they can make money out of their art, it is welcome, but money is not their motivation (they do not work for this). Their motivations are mostly intrinsic. Artists

value highly their reputation (see point two above). Fourth and last point, new business models can be designed around free and open pieces of art. It is possible for artists not to sell directly their copylefted work but to make money out of services, for instance. Keeping a resource free has been shown to be a coherent strategy when one can earn money from complementary assets (Teece).

This protection of art in a copyleft style is part of the measures that emerge to preserve what we call “open creativity”. This open framework may be especially promising for communities of artists, in case where the ownership is complex and cannot be attributed to one or a limited number of individuals. It is also likely to be appealing in cases where the creative process is highly cumulative, when artists are used to creating by mixing and combining existing pieces of art to produce new things. In such a case, it is usually not feasible for new creators to ask for the permission of all the creators of the past. And if it is possible, it obviously increases the cost of creating drastically. In such cases, it is likely that an open or free mode of creation performs better than a permission mode, where IPR would be strong.

The importance of preserving openness in the cultural world was recently emphasized by Lawrence Lessig in two books “The future of ideas” (2001) and “Free culture” (2004). Brilliantly, the author explains that creativity can hardly occur in a world of permission, and that the production of novelty requires the preservation of a free platform on which creators can freely draw to feed their creativity: “A free culture supports and protects creators and innovators. It does this directly by granting intellectual property rights. But it does so indirectly by limiting the reach of those rights, to guarantee that follow-on creators and innovators remain as free as possible from the control of the past. A free culture is not a culture without property, just as a free market is not a market in which everything is free. The opposite of a free culture is a permission culture, a culture in which creators get to create only with the permission of the powerful, or of the creators from the past” (Lessig, 2004, p. xiv).

c) The tensions between the two opposed types of IP (to exclude versus to prevent exclusion)

To summarize, we argued here that communities of creators can only evolve in an open world with weak, if not with no IPR at all, in order to easily use and recombine existing art, which is the raw material of the activity of creation. However this creative requirement is permanently facing a contradictory force: the massification of creative industries, the distribution of art on a world wide scale relies on firms that need strong IPR to protect their products. And, *a priori*, these firms can use a classical mechanism to harness the rights of creators: the “work for hire” contracts. Indeed, if under traditional principles of intellectual property law, the creator of a “work” owns copyrights associated with that work, in case that work was done while being paid as an employee or under a “work for hire contract”, the creative idea is owned by the employer instead. The nomenclature “work for hire” refers to the principles through which IP rights transfer within a corporate enterprise or between a purchaser and contractor. The US Copyright Act defines “work made for hire” as “(1) a work prepared by an employee within the scope of his or her employment; or (2) a work specially ordered or commissioned for use as a part of a creative workif the parties expressly agree in a written instrument signed by them that the work shall be considered a work made for hire.” For example, video games are deemed audiovisual works for purposes of the Act. Essentially, in videogames, unless an employee's contribution to a game is within the scope of employment, or an independent contractor such as a music or sound provider is bound by a written agreement, copyright ownership remains with the employee or contractor. This is true even if the copyright material originates from the idea of, and is paid for by, the developer. To

avoid any possible loss of IP rights to copyrighted material, and at the insistence of publishers, employees and contractors are required to sign contracts that acknowledge the work is made for hire and provide for the explicit and absolute transfer of all IP rights in the video game to the developer at the outset of the engagement of the employee or contractor. Failure to properly account for the transfer of all copyright interests can have potentially devastating consequences for a developer.

However, as in the Hollywood case, a systematic abuse of work for hire contracts can lead to a risk of erosion of creativity. It is therefore important to reconcile those two positions and to explore how efficient firms and a creative underground may co-evolve. In particular, how can firms deal with their two apparent opposite needs: need of creative communities, on the one hand, in order to raise radical new concepts, and need of strong IPR, on the other hand, in order to protect their market.

4. The case of the music industry

In this part we will deal with the music industry, that encompasses the creation, the performance, the recording, and the diffusion of music⁵. It is usually assumed that what makes an industry out of these different activities is the recording activity; this justifies dating the birth of the music industry in 1877 when for the first time ever a sound was recorded by T. Edison. It is also largely documented in the literature that this industry can be seen as organized around the creation, the transactions and the exploitation of a bundle of rights between a large variety of actors. We will summarize this approach and underline how this organization can be justified from a standard economic point of view. However, we suggest that, following the hypothesis presented in the first part of the paper, it is possible to highlight other roles of IPR and corresponding relations between different actors in the creation processes. This will lead us to consider influences of digital technologies on music industry and especially on creative processes, beyond the traditional debates around the economic effects of pirating on Internet.

a) Music industry: a bundle of rights owned and traded by different actors

Rights

Referring to the different types of IPR listed above, the variety of IPR is not very large since mainly copyrights are included. But related to this category, different IPRs on music works coexist. Generally speaking, they correspond to the exclusive right to use the music work and exploit it the way the owner wants to (do it), on a free basis or against payment. This right usually covers any reproduction, performance, adaptation (and even translation in the case of written material) of the work.

Music work can get protection by means of this right only if it meets some basic requirements, in particular related to its novelty (for instance if there is no other melody using the same series of musical notes). But the main point is that it must be translated into a tangible form, being a notated copy or a sound recorded in any form. Then it is neither the idea of a song or of its components nor a musical style that can be protected, but only their manifestation into a musical composition. Obviously, different artists can be the joint creators

⁵ In this broad view, music industry is larger than what corresponds to the class J-592 "Information and communication - Sound recording and music publishing activities" of the International Standard Industrial Classification, i.e. production of original sound master recordings, releasing, promoting and distributing them, publishing of music as well as sound recording service activities in a studio or elsewhere.

of a given music work, and then at the origin of the created IPR. In general, as soon as a music work is created, it potentially benefits from legal protection. But the registration of the music work with the relevant organization is a way to make the enforcement of this right easier.

However, there is a fundamental difference between the music work and its recorded version(s) as recorded sounds, and different rights are attached to each of them. For instance in the UK or the US, the music work is registered as performing art (US) or musical work (UK) (whether it was made tangible as sheet music or as audio record), whereas recorded music is registered as a sound recording (Andersen *et al.* 2007). It also means that different sound recordings can be created on the basis of one given music work, giving birth to a new collection of rights.

Comparing the legislation set up in different countries reveals fundamental distinctions between different types of rights on music, rooted on different rationales for the very existence of rights. Following the Kant tradition (Moureaux, Sagot-Duvaroux, 2002), French legislation provides for a natural right that is intrinsically related to the artist himself ("droit moral", or moral right). It corresponds to the right allowing its owner to control the usage made of his/her music work; this right is not related to the question of payments and commercial exploitation. It includes the right to make a music work public, the right for the owner to be cited as author, the respect of the integrity of the music work, and the right to withdraw the music work from any public audition. This right is not transferable and has no limitation in time. Besides, and following the tradition of John Locke the copyright is considered as a separate type of right (called "droit patrimonial", or patrimonial right) that is applied to the work of the artist. It allows its owners to exploit (through performance or reproduction) the music work against payments. It can be sold, and has a limited duration for its owner and for his heir(s). This right is more or less equivalent to the copyright. Contrary to the "droit moral", this copyright is the only one formally recognised in the Anglo-Saxon countries. However, in these countries, part of what has been defined as moral rights (a weak version of them) is included in the copyright, but is then both tradable and limited in time.

Copyright actually contains different exclusive rights, such as the right to copy the work, to distribute copies to the public, to perform the music or play the recorded work in public, to create adaptation etc. Exceptions or limitations (based on "fair use" or "fair dealing" principles) to these rights also exist under the form of free uses for specific purposes (such as private use or teaching) or non-voluntary licenses⁶. Initially dedicated to the two original form of diffusion of music (live performance and sheet music), copyright has progressively be extended to all new forms of diffusion, such as physical reproduction of recorded sounds (mechanical rights), broadcasting (associated with performance under the neighbouring rights), adaptation and use in the movies or television advertisements (synchronization rights) etc.

In the French system (since 1985), beside the "droits d'auteur" there are the neighbouring rights ("droits voisins"); they are conferred to actors (other than composers and lyricists) who contribute to the musical creation and diffusion. This includes in particular interpreters, but

⁶ For instance, a French specificity is the existence of the so-called "droit à copie privée" (right for private copy) which allows the owner of a vinyl or K7 or CD or any other physical device on which music is recorded to copy it on another physical device, provided that the new copy is only made for private use. Or in the US, once a music work is recorded, anyone else can record the composition/song provide that there is a payment of a statutory compulsory royalty. It should be noted that this generates separately-owned copyright on these new 'sound recordings'.

also under some circumstances producers, communication companies etc. It is narrower than the *droits d'auteur*, and has a shorter duration; however it also includes two parts corresponding to the above mentioned "droit patrimonial" and "droit moral".

Most of the rights on music (to the notable exception of the moral right) can be "cut into slices", especially when different versions of the same music work are translated under different recorded forms and are exploited in different countries through different channels of diffusion. In addition, they can be traded by way of (possibly temporarily and/or geographical limited) sales or licenses, and give birth to various modes of fixed fees or royalties payment evaluated according to various calculation principles. Accordingly, various types of exclusive or non exclusive contracts co-exist between the actors of the music industry. These actors will be described now.

Actors

The music industry includes many different actors, or more precisely many different roles that can be played by different actors, some of them often playing different roles at the same time (Hull, 2004; Caves, 2002). To put it simply, the following roles are usually distinguished.

The *artists* are frequently divided into three categories: the *composer(s)* of music, the *lyricist(s)* (if there are words on music) and the *interpreter(s)*⁷. They are often grouped in musical ensembles or musical bands. They are supposed to create the music, and are then by nature at the origin of the whole process.

The *publisher* manages the marketing and exploitation of music in various ways. He usually has a publishing contract with the artists, that transfers to him the ownership of one or more music works.

The *producer* is in charge of helping the artists to fix the music into a form that can be listened to, essentially to record it; this includes in particular organizing, planning and supervising the recording sessions (and corresponding production budget and resources, as well as coaching and paying the interpreters and musicians), and supervising the mixing and mastering processes. In general, according to a recording contract with the artists, the producer owns the master (but even in the US he is not often considered as the "real author" as the producer can be in the movie industry). He is assisted among others by *sound engineers*, and the influence of both of them on the creative process may be quite important. Management and artistic contribution of producers are sometimes split into two roles, executive producer and artistic producer, respectively. The producer often licenses the right to exploit the recorded music to a publisher.

The *agents* (or talent or personal manager) and the *business managers* represent artists in their business affairs, advising them (and sometimes making corresponding deals) about either in day-to-day business and investment of their incomes, the orientation of their careers, or the negotiation of contracts with other music industry actors.

The *record company* (or record label) coordinates the production and manufacturing of recorded music; the *record distributor* (often the record company) also promotes and distributes the recorded music. Within the record companies, the *Artists and Repertoire (A&R)* person or division are in charge of scouting and of artistic as well as commercial development of artists. A&R is often at the interface between record company, artist's agent, artists and producer. Its role also frequently overlaps with the one of the producer in the organization and supervision of recording sessions.

⁷ One could also add the author of musical arrangements and the adaptator (when lyrics are not only translated but also adapted in another language than the original one). In some countries, both are sometimes legally acknowledged as authors.

Downstream from the value chain there are also obviously the *manufacturers of records* (whatever the type of support, be it vinyl, CD, DVD, tapes...), the *distributors* (who contract with the publisher and/or the producer and/ or the record company) and *sellers* (independent retailers, large "brick and mortar" chains, or more recently internet websites) and *radio* or other *media broadcasting companies*.

A very important and highly specific role is played by the *collective organisations in charge of rights management*, i.e. those who authorise, monitor and enforce IPR (including controlling infringements and acting in case of litigation), and collect and distribute corresponding royalties (they also often conduct lobbying actions, offer scholarships and other support to artists, etc). Their scope of activities⁸ as well as their organization and governance (size, public/private, eligibility, etc) vary from one country to the other, and various international or bilateral agreements exist between these organizations. The diversity of these organizations is logically explained by the complexity of the IPR systems.

All those actors are involved in the trading, enforcement and exploitation of IPR on music. But other actors also play an important role in the creative and diffusion processes, such as the *music training schools*, the *associations of amateur musicians*, and last but not the least the *musical instruments companies* and the *music critics* (of course, various Unions are also part of the landscape)⁹.

Apart from their role, the nature of the actors is also very diverse. Artists are frequently individuals under contracts with (but not employees of) companies¹⁰, whereas producers, managers, R&A etc can have both statuses. They also often set up very small companies or single-person companies, blurring the frontier between individuals and firms. Beside individual artists or producer and firms one can also find a large variety of communities that frequently go beyond the boundaries of the firms and of the networks of actors linked by contracts: musicians, radio DJ, fan clubs, critics etc. We come back to this important point below.

b) Reinterpreting music rights at the center of interactions between individuals, firms and communities

According to the basic assumptions of the present paper, it is first argued that, in creative industries, creation processes are conducted through a close and complex interaction between individuals, firms and various communities, especially knowing communities. Second, the creation processes do not (necessarily) follow the "open science" type of rules; the "underground" world of creation rather follows ad hoc rules that are progressively emerging from the interactions between those actors, depending on the nature of the activity, the technological basis, and on the type of actors that play a leadership role. The IPR regime play a key role : it provides a basis for coordinating the activities of these three types of actors (Cohendet et Simon, 2007; Cohendet et al., 2007), allowing their incentives to be reconciled with the various ways they adopt to develop their specific knowledge assets contributing to the creation. In static analysis, domains where firms and individuals are dominant would favour the emergence of strong IPR, while domains where communities are leading actors

⁸ They may be specialized in specific channels of diffusion (performance, broadcasting, records...) and/or may address specific right owners (artists, record labels, owners of the "droits voisins"...).

⁹ As regards the activities related to public performance, one could also add the *tour promoters*, responsible for organizing live concerts or the *bookers* who book concerts at selected venues.

¹⁰ Sometimes the contract is close to "work of hire" type.

would tend to adopt weaker IPR. But in dynamics, there is a constant tension between the firms' willingness to grasp IPRs in order to get revenues from their exploitation, and the need for communities to have "creative space" in order to renew and develop the reservoir of future creation (the creative slack). Technological changes modify the balance between these two forces and the conditions in which the IPR system can make them compatible.

In the specific context of the music industry, it is possible to provide some refinements to this line of argument. We have first to come up with some elements of a more precise definition of the levels of analysis that we consider. Then, the balance between IPR for exclusion and IPR for open world has to be revisited by examining the roles of IPR in articulating individuals, firms and communities along the creative process; these roles correspond to by securing incentives, coordination and future creation. Those two analyses will allow us to lay the foundations of a preliminary rough framework presented in a third step.

Creation, emergence and exploitation in music

As stated above, the creation and exploitation of music encompass three elements: the creation of music works, the creation of music recordings, and the diffusion through many different ways of these two forms that music takes. Requirements in terms of incentives and coordination, and implications in terms of favouring or hindering future creation are not necessarily the same at each stage. Second, the possibility to take into account the twofold dynamics of innovation, i.e. the emergence phase preceding the exploitation phase, should be raised. By exploitation, we do not mean here the sales of one given music work or recording through different channels (which is here referred to as diffusion), but the activity of creating around some existing music by borrowing some of its features. Although the present article rather focuses on the emergence side, the frontier and the interactions between the two are not so clear in the case of music industry. This question is related to the fact that music creation can be analyzed at two levels: the creation of *new musical styles* and the creation of *new pieces of music* (typically *new songs*). Combining the two points would lead to distinguishing two levels of analysis: the emergence vs. exploitation of musical styles and the emergence vs. exploitation of pieces of music. However, the threshold between the two phases is not straightforward. In the first case, it can be quite easily understood, although it is not obvious to operationalize the concept¹¹. We will mainly concentrate on the first of this two levels of analysis.

In the second case, from an analytical standpoint the difficulty is mainly related to the distinction between music works and music recording, and to the co-existence of different types of artists and "contributors" to music. On the one hand, we face the case of a new music work created by a new artist (either lyricist and/or composer); it is clearly related to a phase of emergence (not to talk about the very originality of the music). On the other hand, we face quite clear cases of exploitation when for instance a well-known interpreter records a new version of a very well-known song without changing anything about the style, arrangement, beat etc in comparison to previous versions (although interpretation as such is a creative act); or the remasterization and "stereo-ization" of a old mono version of an existing song in order to make it available on CD catalogues (although the simple choice of putting instruments and voice on the stereo spectrum may be considered as a creative act). Between those two

¹¹ The number of units of CD sold, the number of downloads of songs of the same style, the "agreement" between critics about the importance of a given (set of) album(s) as a starting point of style, the creation of a class in charts statistics (such as in Billboard) or in the catalogue of record companies could be candidates among other indicators. Of course, this succession of phases is largely too simplistic: for instance, some musical trends may re-emerge with new features.

extremes there are many different cases in which for instance old artists compose new music works but do not record them, or known interpreter "hiring" young composers for their new album, etc. We assume that some of those cases are closer to emergence while some other are closer to exploitation. But it is hardly feasible to draw the line between emergence and exploitation phases between creating music work and creating music recording (diffusion being clearly on the exploitation side), or between new artists and confirmed artists (some artists are constantly "re-emerging" in the sense that they constantly propose new facets of their talents), or between authors and interpreter. Therefore we will not attempt here to build up a more precise categorization. However, exploitation and emergence are not necessarily two phases of one given process, but rather two contexts in which creation occurs; they could be dynamically linked for instance when one given artist moves progressively from the status of an emerging artist with original musical creation to the one of a confirmed artist repeating the same "recipes" from one song to the next.

The trade-off between incentives, coordination and future creation : the best of both (exclusion and open) world ?

The main line of argument underlying the existence of rights is the standard "public good" one, linking properties of music works and of music creation process to *incentives* for creation. Briefly, music work is considered as non-rival (consumption of music does not destroy or alterate it, then it can be consumed several times at different places and time); it is often non-excludable, especially when it is materialized in a form that can easily be copied at low cost. In addition, the way it will be "evaluated" by the potential consumers, and then its success on the market, are highly uncertain for a number of reasons on the demand side (fashion effects, mimetism and superstardom effects, saturation, experience good and weakness of price as signal, etc); even the costs of creating, producing and marketing it are not easy to estimate (especially on the creation side), while the "visible" part of this cost (especially production and marketing) shows a tendency to increase. Then these activities cumulate uncertainty, high cost of production and low cost of reproduction (i.e. an extreme form of increasing return to scale) which both lower the incentives to conduct them and play in favour of trying to reach the largest possible market size by concentrating efforts on Top sellers (stardom syndrome, see Adler, 2005 or Giles, 2006). In this context, a classical solution of the resulting lack of incentives is provided by the award of copyrights for securing exclusion and then restore incentives to invest (Landes and Posner, 1989).

However, this view calls for numerous remarks, at different levels of analysis. First, the public good characteristics of music works highly depend on the technology used for diffusing it. For instance, with live performance, excludability can be achieved by payment and/or by closure of venues; with music sheet, excludability (and even non-rivalry) depends on the capacity to copy it and on the fact that paper copy simply wears out; mechanical piano (invented in the mid-nineteenth century and quickly attacked by music publishers and even by artists fearing for their revenues) was not able to secure a good quality of music reproduction as compared to live performance; recorded music on cylinder and disk was a perfect example of music work turned into private goods thanks to copyright, and is actually at the basis of the present copyright system; in the 20s, radio broadcasting raised these questions again, but proved to favour a development of the demand that subsequently benefited record sales; the possibility of copying K7 and later on CD were other challenges to the excludability and opened the door to mass pirating, but it was limited by the poor quality of the reproduction process (in the case of K7) and because of the still physical nature of the product and the need

for industrial facilities to operate on a large scale (the case of computer files will be tackled below).

A second issue is related to the very nature of incentives: is profitability the only incentives for creating music. How then to justify the existence of musical creation in society where no copyright legal framework exists? Trying to answer this question would lead us beyond the scope of this article. Without going into sophisticated psychological introspection and sociological analysis, one could simply assume that beside the incentives of earning revenues, the desire of being recognized and acknowledged as a valuable artist is a common motive (with the corresponding symbolic and social rewards attached to it), especially for authors. This distinction fits quite well with the distinction between moral rights and patrimonial rights mentioned earlier.

But even if we take the pecuniary incentive argument for granted, is it similarly valid for all actors of the creation process, especially individual artists, publishing companies, record labels etc? Probably not. Here, incentives for creation should probably be distinguished from incentives for massive diffusion. The former were at stake in the previous paragraph. As regards the latter, a key point here is the interrelation between the different ways of diffusion of music work (and the corresponding couples of copyrights and revenues) : good live performances reinforce the attraction for video diffusion, diffusion on radio or TV channels has a positive impact on CD sales, etc.¹² Different actors do not necessarily have the same structure of revenues from the different ways of diffusion : artists may earn more from live performance, publishers may earn more from exploiting music through radio or TV broadcast, record companies may earn more from CD sales etc, agents may earn more when selling derivative products, etc. Each of these ways of diffusion is associated to a specific combination of copyrights. Then the incentives of the actors are not focused on the same ways of diffusion, and do not depend on exactly the same combination of copyright. But since the ways of diffusion frequently reinforce each others, there may be a mutual interest to support all the ways of diffusion and to secure the enforcement of all copyrights.

In this perspective, it can be argued that the copyright system may not be the most efficient system to generate creation, but rather the most efficient one to favour mass diffusion and thus orient the creation towards the most profitable production (Andersen *et al.*, 2007).

It is clear then that the incentive role of copyright is closely linked to another role already discussed in the case of other IPR: that is a strong **coordination** role (Cohendet *et al.*, 2007). Commercial success requires to combine various knowledge resources among which some can be provided only if incentive mechanisms are set up : "Here commercial music value-added is maximized by putting together joint effort to create a joint product between the music authors and a range of complementary musical resources that are not freely available but need incentives." (Andersen *et al.*, 2007). It must be stressed here that communities provides alternative (complementary ?) coordination mechanisms through their social rules of selection, learning and training, knowledge socialization and externalisation processes, transition from "student to master" status, etc.

The structure of the music industry then relies on the need for specialization and complementarity of activities that are required to produce music. But it also heavily depends on the exploitation of scale effects whenever possible, and the necessity to spread risks. Transactions on copyrights can thus also be seen as a way to share the risks, through a

¹² These phenomena may also exist between artists, for instance when they are from the same musical trend or style.

multiplicity of agreements often organizing mutual interdependence between the actors; copyright also constitutes a guarantee for the funds suppliers that fixed costs of production will be covered by commercial success, if any. Economics is particularly keen on analyzing these issues (Connolly and Krueger, 2005; Crain and Tollison, 1997), and has in particular focused on the optimality of contracts between artists and producer. Consequently, the structure of the industry is a highly complex mix between vertical integration and contracts.

On this basis, one could easily understand for instance the existence of large record companies (the famous majors), able to support high cost of production of hits and to reach large markets, as well as to spread risk over a huge and diversified catalogue. Correspondingly, the transaction costs approach helps to explain the tendency to vertical integration under major record companies¹³, because of the extreme complexity of copyright architecture (Curien et Moreau, 2006). This is especially the case when those companies want to maximize the combined ways of diffusion, as previously mentioned, and exploit possibility of discrimination strategies such as bundling or versioning¹⁴.

Another aspect is also the specific role played by collective copyrights organization in collecting and distributing revenues from copyrights. The efficiency of systems set up by the collective organizations has also been largely studied in the perspective of maximizing composite rent and optimizing redistribution mechanisms.

Further, the copyright provides a basis for distributing the composite rent. But it must be stressed that because of the asymmetries of power and information between actors, and the multiplicity of the configurations of relations between them, it is hard to assume that the different actors are awarded revenues to the exact proportion of their contributions to the creative effort.

A third role of the copyright system¹⁵ is also to allow *future music creation* to develop. One dimension of this issue is the capacity of the whole system to leave free some "creative space", in order to make matured, to renew, to enrich the creative potential. As seen above, this role can be played by communities, beside the realm of companies. A certain level of mutualization of IPRs is then required to let this partly open world operates. The question is then to what extent the whole creative potential should be bound by contracts and transaction rules set up by firms.

Another aspect of the issue of the possibility of future creation relates to the classical debate on the scope, breadth and duration of IPR. In the context of music, the attention of the economists has been mostly devoted to the question of the duration. Short duration may favour fast renewal (for instance limiting the tendency of majors companies to exploit their back catalogues). But the easiness and the speed of copying as well as the lifespan of consumers tastes are also to be taken into account when determining the length of the monopoly provided to the "first mover". The other side of this question concerns the content of the creative work and the related question of the "anti-commons tragedy". As previously

¹³ That is not always clearly distinct from horizontal concentration, given the overlap of roles played by the actors.

¹⁴ Bundling is for instance offering best of, compilations, or more simply combining one hit with other more common songs on the same CD; versioning is offering different versions of the same piece of music at different date, quality or available quantity.

¹⁵ Obviously, the IPR system should also ensure a diffusion compatible with consumer needs, in terms of quantity and diversity (the demand side of the welfare question). But the present paper does not directly cover this aspect.

stated, copyright claim assumes that the creativity has materialized into a specific form (the music work). It means that a many "creative bricks" that compose a music work or a recorded music are not protected as such : the formal structure (e.g. the typical 3 chords structure in blues or rythm'n'blues, or the jazz turnaround), the rhythm pattern (e.g. the inversion of Snare drum in reggae beat), the musical elements such as guitar solos and rhythmic patterns (e.g. the heritage of Robert Johnson, BB King or Chuck Berry ...), string or brass arrangements, ways to combine chords and scales, the intonation of the singer, the components of the sound itself (echo or reverb effects, position and balance of instrument in the musical space, ...). Part of these elements are clearly related to uncodified knowledge. Moreover, "creating around" by copying some elements of the creative bunch is often to the advantage of the initial author, because it may contribute to the development of a music style or trend, reinforcing the prestige of the "original" author and his possible sources of revenues. Then there is clearly an open space for creative processes without infringement of music rights, and so far the copyright system could not be accused of limiting the "technical" possibility of creating music (as opposed to the "economic" possibility depending on the existence of incentives).

A framework

Trying to reassemble these pieces of the puzzle leads us to propose the following framework, in which two levels of analysis are addressed (pieces of music and music style). As already mentioned, it must be stressed that in the case of the music style, the two situations (emergence and exploitation) are assumed to be two phases of the same dynamic process. We argue here that the emergence phase is more likely to be organized according to "open world" type of IPR system, while the exploitation phase is mor elikely to be ruled by "exclusion world" based IPR system.

Incentives are always at the heart of the system, although given the variety of competences required to create (and later to diffuse) music, it always goes with coordination requirement. But the nature of incentives rules the type of rights that is the most suitable to ensure either rewards or coordination.

In this perspective, in the emergence phase, the key point is to make yourself known by the others, and then to appear as the one that has authored (or is able to author) new music work. This may be conveyed by the award of moral rights, but it is also a matter of gaining reputation by other means (live performance, sessions, word of mouth). In the case of music style, different artists (whose number and identity are not always strictly delimited) are collectively constructing their reputation, with moral rights being part of an even more complex process of recognition. Knowledge is more of a tacit nature : neither specificities of artists nor the ones of the music style are stabilized and easily reproducible. Firms are not in the game yet. Communities (musicians, fans, DJs, bookers, tour operators, bar and small clubs landlords, music critics, local authorities, etc) are important to both circulate and combine new ideas (Grandadam, 2008; Brown *et al.*, 2000; de Lima e Silva, 2004; Lena, 2004). They take care of the coordination, and they are at the same time the locus of progressive codification of knowledge and creation of the new codebook and grammar of the new music style. They contribute to the creation of a public good, the new music style, which is exploited in various ways. Key players at this stage are also the single-person firms set up by independent producers or managers (creating labels such as in the case of Jazz, Grandadam, 2008). They can be seen as hybrid form between individuals and firms, and in close contact with the communities, and allow for a mutualization of IPRs. However they are attracted on the one side by the exclusion world and the tendency to become classical firms to fully exploit

a privatization of IPR, and on the other side by the need to make alive the open world to feed the creative process.

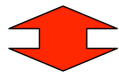
As a music style progressively reaches a certain level of fame or commercial success, we are moving to the exploitation phase. The battle moves towards the distribution of revenues, and the standard copyright system briefly described in the previous part of the paper progressively dominates. The hybrid forms mentioned above typically tend to evolve to standard firms, or become part of standard firms (the case of the label Motown is one archetypal example in that respect). Firms are progressively imposing the exclusion world, typically by using the standard recording or editing contracts. Copyright plays the key role in coordinating efforts, with individuals (artists and managers typically) and (record) companies as key players. However, part of the “life” of the music style is still enriched through the interplay within and between various communities, be they specialized musicians, addicted fans, critics, and producers (Watson, 2007). As the copyright does not refrain from sharing some of the creative content of music (see above), these exchanges and the related “creative slack” can be maintained.

An interesting point in the long run is that when copyright falls, the music works that were at the origin of the music style and are the most emblematic of it are either taken over by the interpreter-interpreter-firm model (the left part of the table) and maintained by other sorts of actors such as musical ensembles, choral societies, local “revival” groups etc. The latter can also be seen as communities, which act as “selectors” of members of the club and as teaching entities rather than entities devoted to codification or coordination of music creation.

Emergence of music style

ex. be-bop in Jazz music; rock + r'n'b USA 50s; reggae in Jamaica; house music in Detroit ...

- communities + individuals + single-person firms
- codification / codebook: creation of public good = style

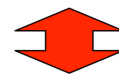


- weak IPR; key = recognition (moral rights)
- coordination by communities & hybrid actors (labels, producers-managers...)
- constant flow in/between communities

Exploitation of music style

ex. Tin Pan Alley; swing 30s/40s; disco music after 1977 Saturday Night Fever hit ...

- firms + individuals-stars
- generating revenues by embedding public good in private goods



- strong IPR; key= monetary incentives (copyrights)
- coordination by market transaction / IPR ownership
- publishing & recording contracts

It must be noticed that when adopting the analysis at the level of song or pieces of music, it appears that there are several degrees between the emergence of completely new things by unknown artists and the exploitation or recombination of existing pieces of "musical knowledge". The two situations of emergence and exploitation are assumed to be contexts not necessarily succeeding each other. The mix between exclusion world and open world is then probably more specific to local context (in space and time). The "emergence" situation is very closed to the one at music style level. But the role of communities is probably less important and the one of the individual managers or producer may be more crucial. To put it differently,

while a musical style seldom emerges without a strong commitment and implication of various communities, it is quite often the case that new songs from new artists are an individual matter¹⁶. It is mainly true as regards the composers and lyricists. The case of interpreters is a bit different: they are often a "pure product" of strategies of firms, which from the beginning take strong positions on copyright. When the interpreter succeeds in being commercially visible, it is frequent that his power of negotiation over the rights (or the one of his personal agent) increases, and so do the associated revenues. But he generally conducts this negotiation with the aim to maximizing revenues, and is a strong advocate of copyrights. In few situations of emergence of new interpreter (and *a fortiori* in exploitation phase) real artistic novelty occurs, then it is mainly a matter of mixing largely codified knowledge (in terms of musical content and of promotion and marketing strategies). What makes the situation more complex is that in some "intermediary" contexts, new songs are created by composers and lyricists working as employees of established firms or under "work for hire" type of contract. In the late 19s/early20s Tin Pan Alley publishing houses were the first to set up this organization, also illustrated by the pool of authors dedicated to Elvis Presley in the late 50s early 60s. In other instances, individual authors or producers are so well-known that they have a powerful position in negotiating copyrights (e.g. the producers in Rap or Hip-Hop music, or composers such as the French Didier Barbelivien).

However, even if it is not the only key factor of evolution, technology largely influences the effective set up and functioning of the different sub-systems briefly sketched here, their relative importance in the overall music industry, the corresponding nature and role of IPR regimes and the nature of the key players. In particular, it affects the domination of the "exploitation"-type of situation over the "emergence"-type of situation at the song level of analysis, and the move from emergence to exploitation of music style. Let us take some typical (and oversimplified) examples from the history of the music industry in the US along the twentieth century (Tschmuck, 2006).

Before the commercial development of phonographs at the beginning of the XXth century, the music industry was dominated by the publishers. Realizing that the emerging recording industry used the publishing company's repertoire without paying for it, the publishers obtained the promulgation of a revision of the Copyright Act in 1909 (and a few years later the creation of the ASCAP - American Society of Composers, Authors and Publishers) which set up fees on each music cylinder, record and piano-roll. Music creation was then determined by technological characteristics (acoustic recording and limited duration of recording capacity) and the "alliance" between Tin Pan Alley publishers and composers, recording industry and music theater houses. Exploitation progressively dominates, both at the level of the pieces of music and at the one of the music style. While in the early period of the phonographic industry, local music, minstrels and vaudeville shows artists were often at the source of the music creation, the mainstream style (waltz melodies, marching music or revues or theater music numbers) rapidly superseded them, imposing well-known artists and songwriters routines. Besides, some "outsiders" music styles were incorporated in the "music factory" such as ragtime or early blues, but under an altered form and following the artistic and commercial rules already set up.

¹⁶ Of course, the situation is sometimes more confused when one given song is considered as being at the origin of a brand new music style (as was the case of the 1956 Rock Around the Clock Bill Haley's hit). But depicting the emergence of a style in such a simplistic way is often a bit unrealistic and closer to a "fairy tale" than to a sound historical analysis.

Changes occurred in the 20s largely due to the possibility open by electric recording and broadcasting. Then national radio stations took the lead over the record companies (which often became subsidiaries or subdivisions of the radio companies), imposing new rules. Especially, "radio broadcasting required control of the musicians rather than of the copyrights of the music they played" (Tschuk, 2006). The "swing era" emerged in the late 20s and reached its peak during the second world war period, in parallel with the preeminence of radio companies over record companies and publishing companies. It progressively dominated the various styles that had emerged at local level with the help of local concert venues and small records labels. The new model was based on the direct broadcasting of Big Bands, playing either in large dance halls (such as Cotton Club) or in radio studios. Leaders of big bands (often also business men, from Paul Whiteman to Benny Goodman) and music arrangers (recycling continuously the same type of tunes) were key players, together with radio companies.

Another revolution was brought later on by Rock'n'Roll (Geels, 2007), rooted in the long-lasting development of music styles (race music, hillbilly) that remained at the margin of the dominant system after having met some successes in the early 20s, thanks to the Okeh label in the case of hillbilly (Roy, 2004). The changes relied on the existence of communities of musicians and locally-based independent producers also often acting as A&R and managers (from Atlantic to Chess or Sun, or later on Motown etc), or local radio DJs (to some extent, be-bop in jazz had paved the way, with labels such as Verve or Blue Note, despite their differences in style). Rock'n'Roll evolution was backed up by new broadcasting techniques and regulations, but also by the development of small stereo record players, cheaper recording techniques and electrical music instruments. They largely contributed to designing the structure of music industry that prevailed up to the beginning of the XXIst century : majors (oligopoly-type of companies including recording, publishing and distribution activities) surrounded by the so-called independent labels, which are more specialized in promoting creativity and scouting new talents (many of these labels being also licensed by majors as producers, and/or distributed by the majors, before being absorbed by the majors in a growing process of vertical integration).

Despite the past technological changes, the IPR system based on copyright has allowed an equilibrium between incentive requirements, coordination requirements and possibilities of future creation to be maintained. But the interactions and balance of power and influence between the three actors involved in the creative process (individuals, firms and communities) has evolved, as the relative importance of emergence and exploitation situations varied. The last issue is to consider the impact of the current technological changes related to digitalization.

c) Another face of the digital revolution ?

Digitalization¹⁷ is not a recent phenomenon, but it is mainly its combination with the generalization of broadband Internet connections since 2002-2003 that has started to have a

¹⁷ Let us briefly recall that it corresponds to digitalization of sounds (at recording and diffusion levels), compression of data down to an equivalent of roughly 1Mo per minute of music, encryption, recognition; it affects recording, storage, transmission, sharing, tracking and retrieval and music files (and of applications); in particular it allows diffusion of music files through download/upload from/to a given server or between two or more computers (peer-to-peer), or through streaming, or through capture of sound diffused on Internet; it also allows easy (although often restricted) transfers between physical devices (computer hard disk, CD, MP3 player such as iPod, etc). Effects on creation are examined with more attention in the text.

massive impact on the music industry. Many studies have focused on the impact of digitalization on the music industry at the diffusion level, debating on the effects of pirating and illegal exchanges of music files on the sales of music and on the revenues of actors of the music industry (for recent surveys and different points of view on this, see for instance: Andersen and Frenz, 2007; FAD Research, 2004; Frost, 2007; OECD, 2005; Peitz and Waelbroeck, 2006). The possibility to adapt the copyright-based IPR system to this new environment and its capacity to ensure a sufficient level of incentives for music industry actors to be involved in music business obviously are at the core of the analysis.

In this part, we will try to shift the attention to other important impacts of digitalization that can be observed at the creation level. Of course, this question is not completely independent of the previous one, and the objective of the analysis is rather to provide a complementary look at the global digitalization phenomena in the music industry.

Some aspects of the technological changes

A key point here is that digitalization induces a technological convergence between recording, diffusion and creation. Roughly, a growing share of the music is made directly on computers, using dedicated software and ad hoc sound cards (or audio cards). It means that the possibility to copy / diffuse is at the very heart of the creative process: it is indeed easier to buy or copy software than to buy a saxophone or to reproduce a violin sound. To some extent, the recording activity is the same operation as composing and playing. Then the producers of musical instruments are now increasingly producers of software, and are facing the same problems related to non-rivalry and non-excludability as the software industry. There is thus a partial technological convergence as well as a convergence of the problems faced by the music industry actors. On the other hand, digitalization also favours the development of new connections between the music industry and other sectors such as ICT and services (for example on a local "cluster-type" basis, as analyzed in Power and Jansson, 2004).

Recording is also increasingly accessible to anybody who has a computer. The speed of transfer of functionalities and performance features from expensive professional solutions to general public cheap software has been impressive in the last ten years (see the case of the basic Apple Garageband software that almost offers the possibilities that were at disposal of professional studio some years ago). It means that almost anybody with a basic knowledge in computer can record a piece of music of a quite high quality with standard home studio facilities.

Digitalization also makes easier it to escape the constraints of space and time in music creation. On the one hand, it is not necessary anymore to very carefully transport huge record tapes from one place to the other; on the other hand, internet services (such as at www.ejamming.com or www.jamnow.com) now allow different musicians located anywhere in the world to play together at the same time (of course with technical difficulty but things are improving constantly). This also opens the possibility to organize public broadcast of the performance by the same way, and even to give shows on Second Life (see the case of <http://virtualliveband.de>).

In parallel, the digitalization has allowed or induced the creation of new musical styles and new musical expressions almost fully relying on digital instruments, often grouped under the terms techno or electronic music.

It can also be noted that consequently, there is a growing tendency to codification at the level of the sound themselves, of the way to produce them, of the way to play them as well as of the way to combine them.

With a potentially more massive diffusion of music directly by the artists, recognition can be obtained on a larger scale without going through the distribution by majors that follow pure monetary incentives. Then "social" rewards can be fully dissociated from monetary rewards (one frequently talks about "number of downloads" rather than "number of CD sold"). This massive distribution may also favour access to music for potential future artists, who can listen to many styles and artists. As we know that musical talent largely flourishes through listening to existing music, it means that diffusion for the purpose of generating revenues is not a prerequisite for maintaining a potential of music creativity and diversity.

All these changes are combined with the changes in diffusion possibilities as well as the even more global changes related to the possibility of interconnectivity between people.

The relations between actors of the creative process seem to be drastically modified by digitalization, and no new models are clearly emerging as dominant ones. Correspondingly, it is questionable whether the copyright-based IPR system can still allow for a balance between exclusion and openness by playing the threefold role it used to play in the "old" music industry. One key question is whether firms can keep on leaving the room for creation out of their realm (even if they did not always do it on purpose) if they could not get some money back anymore at the other end of the system, ie the diffusion of music.

More precisely, we think that three consequences of digitalization should be emphasized.

The growing importance of communities and the diversification of their activities

The growing importance of the role of individuals, and moreover, of communities seems to be one the main consequences of digitalization. This phenomenon takes many various forms. It can be observed in the relation between artists and consumers (Baym, 2007). They often share the same "internet" culture, using Myspace, napster or the similar P2P services, etc (Ebare, 2004). There is not only the possibility of direct link between them; the point is that they are often alternatively artists and consumers using the same communication channels. The recent success of artists such as on Myspace or People.Sound etc (such as Arctic Monkeys or Clap your hands say yeah) may be thus the visible side of the iceberg. The long term consequences of this has still to be thought of (Martin, 2004). In the same vein, some artists are starting to offer internet users the possibility to make another mix of their existing music, by putting some of the recorded tracks of their songs on the net (Arcade Fire on www.rorrimkcalb.com). Some kinds of contest are then organized to award the most appreciated new version.

The existence of communities of artists is also to be underlined, facilitated by the technical solutions evoked above. Communities of users of software instruments are also developing (Doloswala, 2006). Other initiatives seem to be extremely interesting (see for instance Beuscart, 2007 and Martin, 2004).

There are also more recent attempts to attract potential funding from internet users for sustaining publishing, production and/or distribution of new artists. Some (such as <http://magnatune.com> created in 2003 at Berkeley University¹⁸) are "simply" on line labels: they select artists on the basis of demos sent to the labels, and then an internet user can download files that can be played on any device, or buy on-line the CD at a bottom price that can be higher if the internet user is willing to. Revenues are 50%/50% shared by the label and the artists. Others are proposing internet users (called the "believers" for instance on www.sellaband.com) to provide funds for supporting the recording and the development of

¹⁸ which lately set up DRM and thus to some extent "betrayed" the creative commons philosophy they seemed to have adopted previously

artists (other examples are ArtistShare, NoMajorMusik, Spidart, ProduceMyLive or MyMajorCompany recently launched in France by the son of an artist who is actually one the top copyrights collector ever). Once a minimum amount of money is gathered, the supported artist goes to studio, and some of the recorded music are distributed freely on the website, while others are sold. Revenues are split between the site, the artist and the group of supporting internet users. But the artists own the recorded music, and are not bound to the producer with the classical long-term contract; they can therefore "leave" the system as soon they want.

All of these initiatives are covering creation and diffusion activities, sometimes with an overlap. They also show that the coordination role could be partly achieved through internet, rather than by the use of various specialist (producers, A&R, marketing man...) whose interest are organized around the exploitation of copyrights.

Emergence of new IPR devices vs diversification of the scope of old IPR devices

A lot of the initiatives mentioned in the previous section are based on the use of rules set up for a free and legal diffusion under the Creative Commons model initiated by L. Lessing (see for instance www.jamendo.fr). The first objective is precisely to provide solutions that not only help artists to choose the desired level of control over their music. Different possibilities are offered to the artists: the baseline is to authorize sampling, reproduction and non commercial diffusion, and to keep trace of the paternity of the music work. Then they may choose to authorize commercial diffusion or not, to authorize modifications or not, etc. They can also choose to have the possibility of earning revenues from donation of the internet users and/or for advertisements. In the backdrop, the objective is also to develop communities of musicians, producers, auditors etc, by the use of various fora, blogs, tag system, rooms for critics of songs, etc. This is important to emphasize that such open regime is proposed both in the creation activities and in the diffusion activities.

Of course the individuals are also trying new concepts and new conducts, generally outside (at least apparently) the traditional contract relationships with firms and the rules imposed by them. The attempt (which actually ended without success) made by the French group Daft Punk to have their own control on the management of their copyright independently of copyright collective organization is one example; the first release diffusion (through Internet) of the last record of Radiohead (*in rainbows*) has also attracted a lot of attention at the end of 2007: the internet users were asked to pay the amount they wanted for downloading this record¹⁹.

Some other artists (such as David Bowie) pretend they were ready to give up any copyrights claim in the future and that they will concentrate on other ways of marketing their images. Another way was evoked by an artist ready to propose unique and personally signed units of CD (at a price of 800 €), in an attempt to restore the unicity of pieces of art (Etienne Charry in Libération 24/01/2004)

Through these initiatives, individuals often try to find other ways of securing revenues, either by avoiding the use of copyright, or by restoring excludability or rivalry of their music. Of course, record companies also try various strategies to compensate for the decreasing revenues from CD sales, presumably not compensated (yet) by "digital sales" (IFPI, 2007; IFPI, 2008). These strategies are also often at the level of diffusion rather than at the level of

¹⁹ This can also be seen as a perfect example of measure of price elasticity, of gathering various data on consumers, and of versioning since a "de luxe" version with higher music quality was released on CD afterwards.

creation. One could also note that they are sometimes associated to an extension of the domain of IPR, adding copyright on music to other copyright or brand names. Beyond the attempts to develop technical systems (such as DRM) allowing the replication of the old copyright models, they for instance consist in new types of bundling and versioning, increasing attractiveness of "old" CD for instance by higher sound quality than computer files or by adding booklets; reproducing the dual system of majors vs. independent producers with the role of the latter now played by internet social sites; diversification of channels of diffusion, such as phone rings, commercials, live concerts²⁰, derivative products, videogames etc²¹.

Changes in the nature of cumulativeness in creation ?

A last but probably highly important aspect is related to the very nature of musical creation, and its cumulativeness character. Musical creation is still using existing music, but differently from what happened in the past. Creation seems more and more relying on recombination of existing pieces of music or sounds. Instead of using or copying styles, rhythms, chords patterns and the like, (which were not covered by copyrights), sampling is more frequent as well as the use of pre-formatted sounds available for instance on drum machines or other sound base. These two elements may also be more dependants on IPR: sampling because of copyrights, "sounds" because they are related to IPR on software. Hence, these changes in the nature of (some) music may have some consequences on the capacity of the IPR system to leave room for future creation.

More deeply, this is also the nature of the individual artists which is in question. Even if we do not take into account the more general "collective" nature of any if not all creative processes, the "romantic" view of the individual author implicit to the copyright system, is less and less true (Moureau and Sagot-Duvaouroux, 2002). There is a loss in the "continuity" of the link between an artist and his creation, which may have an impact on the very creative process in the future (Heinrich, 2003).

Most of the issues raised in this part are only speculative remarks at this stage. An analysis is still to be conducted on all of these points to really apprehend the deep modifications that are going on, and to distinguish between the adaptations to the new technological system from the radical changes. However, from the perspective we adopted in the present article, two main questions are emerging here: how pervasive and sustainable is the role of communities as compared to the ones of individuals and of firms? And in order to balance exclusion and openness (and secure the three roles allowing the interactions between these three actors), should we adapt once again the old copyright system, should we design a new overall IPR system, should we create different IPR tools to fulfill each of the roles, or should we design alternative institutions to do it ? At this preliminary stage of reflexion, there is no clear and definitive answers those questions.

5. The case of the video game industry

²⁰ The live performance activity has sharply risen in the last years and is now subject to a movement of integration and transnational acquisition. They represent the major source of revenues of many artists, re-emphasizing the stardom characteristics of the music industry. Here again, the interests of individuals and firms seem to coincide to a certain extent.

²¹ We do not talk here about other types of firms such as internet providers, telecom companies or electronic product manufacturers which are increasingly present in the music diffusion landscape. Nor do we talk about the alternative funding sources and related payment systems such as subscriptions to music sites, on-line one song purchase, resources from advertisements, fix fee for internet access, taxes on hardware, etc.

As a creative product, a video-game develops in stages. The earliest stages of game development, pre-production, include design, research, prototyping, proposal-writing, and tool acquisition. The middle, or production, stages involve asset development, feature implementation, and integration. The final post-production stages require testing, balancing, final modifications, and all of the activities that get a game into the distribution channel: package design, technical and user documentation, release coordination, replication, and shipping. The developer of the game as a legal entity enters into numerous business agreements with employees, suppliers, contractors, investors, and publishers over the course of this life cycle.

Each stage requires the integration of creative processes (code, art, sound, and imagination) with associated IP. One of the main creative activities of a videogame is the *game design*.

Game design is the art and science of creating the game itself: the ideas, stories, worlds, characters, gameplay mechanics and so on. However, code is also a key creative element of the game. For the gamer, the *code* is the invisible heart of the game; for the developer, it is the beating heart of the business. Without the code, a game is little more than a great design document and a lot of individual art pieces. Besides the game design and the code, there are a myriad of other creative activities involved in a game such as audio, sound design, graphic design, etc.

The IP agreements in the game development lifecycle will help the developer to acquire ownership of the game assets, license the tools and technology necessary to make the game, acquire licensed IP to make the game and convey ownership of the game, or license the game to the publisher who takes it to market. The main IP agreement that a developer may sign is that with its publisher. But the developer/publisher relationship actually has several contracts that comprise IP agreements associated with it. The first in the process is normally a mutual Non-Disclosure Agreement (NDA) that should be executed by both the developer and the publisher prior to the developer presenting its project to the publisher for consideration. This agreement determines the scope of the proprietary information to be exchanged and the responsibilities of each party with respect to not disclosing that proprietary information.

Copyright is generally the main option for the developer to acquire ownership of creative inputs, such as in game design or game code which is made up of many parts, with different authors and different companies to which those copyrights are assigned. However, licence is also a frequent option. For example, most console manufacturers require the developer to sign a license in order to have access to the proprietary information (API, etc) needed to develop games on that platform. These licenses identify proprietary information (trade secrets) and control the dissemination of such information.

In fact, intellectual property laws offer a large array of tools to protect the creative inputs of a videogame. For example, as IDGA (2003) underlines: “all games, regardless of their type, content, country of origin, target platform or supporting media, comprise some combination of copyrights, trademarks, patented technology and trade secrets. A finished game often contains many different intellectual properties, owned by many different parties. Within each category, some assets are created "from scratch" while others are licensed from others, whether for reasons of efficiency or publicity”.

However, looking at the sole agreements between the game developer and the entities (individuals or firms) holding licences or claiming copyrights, would be misleading if we aim at understanding the governance of creativity in videogames. The creative activities involved

(game design, production of codes, etc.) in a game require the continuous building of theories, models, styles, trends, and on which result from collective interactions between individuals belonging to creative communities. For example, Cohendet and Simon (2007) underline that in the case of Ubisoft, the game designers who are involved in different projects carried out by the company remain connected to their community on a daily basis. They continue to exchange and interact with the other members of the community (some members working within the same firm, but many others working in different institutions) and even tend to enrich the knowledge of their community by bringing the experience gained during the project they are assigned to. In this dynamic process, they clearly cope with a dual identity, as members of a given project in the firm and as members of a given community.

One of the advantages of this permanent connection is that it provides opportunities for feedback between the micro creativity that emerges from the daily activities during the project, and the macro-creativity that is the expected output of the creative communities. The creativity of a project should not be confined to the macro-creativity set up at the beginning of the project by the project managers. A creative project should be able to incorporate new ideas and innovative suggestions, and all the micro-creative inputs that emerge from the day to day activities during a project. This micro-creativity compensates one of the main drawbacks of the hierarchical conduct of any project: there is the risk if the hierarchy strictly controls the timing of a project that this constraint excludes any significant feedback in terms of conception, and thus may imply a loss of creativity by killing the micro-creative inputs. The dual identity mitigates this risk, by allowing permanent interactions between micro and macro creativity. In practice, this permanent interaction may lead to two main effects. First, it may happen that if a micro-creative idea that has emerged during a project appears to be relevant, it can quickly circulate within the communities through regular exchanges, be improved and validated through these exchanges, and be introduced directly into the project, *i.e.* be enacted. Second, micro-creative ideas that emerge during a project can be absorbed in the active memory of some creative communities, as a *creative slack* that could be used in other projects.

The key role of creative communities in the development of videogame has a consequence in terms of IP. Creative communities will claim weak IP devices to maintain their collective endeavour of building the quasi public goods that offer codebooks and grammars of usage to the creative activities. The spectacular development of open source based videogames, copyleft systems, or creative commons in the domain, offers clear evidences of the presence and claims of creative communities. There are myriads of examples supporting this fact: In many games the game source code is released as public domain along with the shareware-released media files, in *Adventure* the original text adventure game, source code is public domain; *Wesnoth* is an open-source strategy game, *FreeDoom* is a set of open source graphics files for open source versions of the Doom engine, *GNU Go* is a free program that plays the game of Go, *Rocks'n'Diamonds* is an open-source, cross-platform, arcade game that contains clones of *Boulder Dash*, *Emerald Mine*, *Supaplex* and *Sokoban*. *Ur-Quan Masters* is the classic *Star Control 2* game, re-released under the GPL license, etc.

Contrary to what some experts argue, our view is that the claim of creative communities does not threaten the industry of videogames. It is quite the opposite: the reward of weak IP to creative communities through copyleft, open source or creative commons is the guarantee of the building of the fertile soil of creativity which favours the interests of talented individuals as well as active companies in the field.

Conclusion

This work is a first step of an ongoing exploration of the creative industries and the role played by intellectual property rights to foster creation. Traditionally, IPR are considered as instruments to protect creators, to enable them to earn a remuneration and therefore to increase incentives to create. We argued that this view presents only half of the story. IPR fulfil also an important role of coordination of creative activities. This latter role is especially relevant when numerous and heterogeneous actors are part in the creative process.

We first emphasised the fact that creation is a collective process that involves interactions among three main types of actors: firms, single individual and communities. Yet, each of these actors may need different and sometimes contradictory types of IPR. For instance, firms usually need strong IPR to prevent free-riding and to be able to commercialise art. But, on the other hand, creative communities usually need weak IPR to be able to reuse without control existing piece of art that is the raw material to create new things. At the intersection between firms and communities lies therefore a potential IPR dilemma: Firms need creative communities to provide them with a continuous stream of new creation. But firms also need strong IPR to make money out of new piece of arts. To analyse this dilemma we selected two creative industries: music industry and video games.

As compared with more traditional studies, this work puts therefore the emphasis on underground creative communities, which play a fundamental role to introduce radical novelty, new fashions, styles, etc. More and more often firms acknowledge the importance of these communities and the necessity to establish links with them. Yet, since the two modes of functioning (firms vs. communities) are radically different, it is not easy to make those two worlds co-exist. Creativity needs openness while mass distribution requires a degree of appropriation, of control. We find here the traditional tradeoff that IPR must help to solve. Putting the cursor too far on one side either stop creativity or prevent a large distribution of art.

At the end only one thing is certain: firms, although they feel threatened by underground creative communities, need them. Successful firms in the future will be those who implemented the best strategy to harness the creative potential of communities. And among those strategies, relaxing some control over their IP is likely to be one of the concessions.

Bibliography

Adler, M., 2005, Stardom and talent, in V.A. Ginsburgh et D. Throsby (ed), Handbook on the Economics of Art and Culture Vol. 1, North Holland, Amsterdam, 895-908.

Andersen, B., Kozul-Wright, R., Kozul-Wright, Z., 2007, Rents, Rights'N'Rhythm: cooperation and conflict in the music industry, Industry and Innovation, Vol. 14, Issue 5, 513-540.

Andersen, B., Frenz, M., 2007, The Impact of Music Downloads and P2P File-Sharing on the Purchase of Music: A Study for Industry Canada, available at http://strategis.ic.gc.ca/epic/site/ippd-dppi.nsf/en/h_ip01456e.html.

Baym, N. K., 2007, The new shape of online community: The example of Swedish independent music fandom, First Monday, volume 12, number 8 (August), URL: http://firstmonday.org/issues/issue12_8/baym/index.html.

Benkler, Y., 2006. Freedom in the Commons: A Political Economy of Information. Yale University Press.

- Beuscart, J.-S., 2007, Les transformations de l'intermédiation musicale - La construction de l'offre commerciale de musique en ligne en France, *Réseaux*, n° 141-142 2007/2-142, 143-176.
- Brown, A., O'Connor, J., Cohen, S., 2000, Local music policies within a global music industry: cultural quarters in Manchester and Sheffield, *Geoforum*, 31, 437-451.
- Caves, R.E., 2002, *Creative industries: contracts between arts and commerce*, ed. Harvard University Press.
- Connolly, M., Krueger, A. B., 2005, Rockonomics: the economics of popular music, in V.A. Ginsburgh et D. Throsby (ed), *Handbook on the Economics of Art and Culture Vol. 1*, North Holland, Amsterdam, 667-720.
- Crain, W. M., Tollison, R. D., 1997, Economics and the architecture of popular music, *Journal of Economic Behaviour and Organization*, Vol. 901, 185-205.
- Curien, N., Moreau, F., 2006, *L'industrie du disque*, Ed. La Découverte, coll. Repères n° 464, Paris.
- de Lima e Silva, D., 2004, The complex network of the Brazilian Popular Music, *Physica A* 332, 559 – 565.
- Dalle, J. M., Jullien, N., 2003. *ELibre, Software : Turning Fads into Institutions*. *Research Policy* 32, 1-11.
- Doloswala, N., 2006, Creativity and access in electronic music: cracked and pirated software instruments, *Druid Summer Conference 2006*, 18-20 June, Copenhagen, Denmark.
- Ebare, S., 2004, Digital music and subculture: Sharing files, sharing styles *First Monday*, volume 9, number 2 (February), URL: http://firstmonday.org/issues/issue9_2/ebare/index.html.
- FAD Research, 2004, The changing face of music delivery : the effects of digital technologies on the music industry, http://www.pch.gc.ca/pc-ch/pubs/effects/tm_e.cfm.
- Frost, R. L., 2007, Rearchitecting the music business: Mitigating music piracy by cutting out the record companies, *First Monday*, volume 12, number 8 (August), URL: http://firstmonday.org/issues/issue12_8/frost/index.html.
- Geels, F. W., 2007, Analysing the breakthrough of rock'n'roll (1930-1970) – multi-regime interaction and reconfiguration in the multi-level perspective, *Technological Forecasting & Social Change*, 74, 1411-1431.
- Giles, D. E., 2006, Superstardom in the US popular music industry revisited, *Economics Letters*, 92, 68–74
- Grandadam, D., 2008, *Des Réseaux, de la créativité et du jazz*, Thèse de doctorat, Université Louis Pasteur, Strasbourg, France.
- Heinrich, M.-N., 2003, *Création musicale et technologies nouvelles – Mutations des instruments et des relations*, ed. L'Harmattan, Paris, France.
- Hull, G. P., 2004, *The recording industry*, 2nd ed., Routledge, New York, London.
- IFPI, 2008, *Digital Music Report*, International Federation of the Phonographic Industry (IFPI), London, <http://www.ifpi.com/>.
- IFPI, 2007, *Recording industry in numbers*, International Federation of the Phonographic Industry (IFPI), London, <http://www.ifpi.com/>.
- Landes, W., Posner, R.A., 1989, An economic analysis of copyright law, *Journal of Legal Studies*, vol. 18, issue 2, 325-363.
- Lena, J. C., 2004, Meaning and membership: samples in rap music, 1979-1995, *Poetics*, 32, 297-310.
- Lerner, J., Tirole, J., 2001. The Open Source Movement: Key Research Questions. *European Economic Review* 45, 819-826.
- Lessig, L., 2001. *The Future of Ideas*. Vintage Books, New York.
- Lessig L., 2004, *Free Culture: The nature and future of creativity*, Penguin books.
- Martin, A., 2004, *The Entertainment Industry is Cracked, Here is the Patch*, ed. Publibook, Paris.
- Moureau, N. et Sagot-Duvaurox, D., 2002, Quels auteurs pour quels droits ? les enjeux économiques de la définition de l'auteur, *Revue d'Economie Industrielle*, n°99, 2^e trimestre, 33-48.
- OECD, 2005, *Digital Broadband Content: Music*, DSTI/ICCP/IE(2004)12/FINAL, OECD, Paris
- Peitz, M., Waelbroeck, P., 2006, Piracy of digital products: A critical review of the theoretical literature, *Information Economics and Policy*, 18, 449–476.
- Power, D., Jansson, J., 2004, The emergence of post-industrial music economy? music and ICT synergies in Stockholm, Sweden, *Geoforum*, 35, 425-439.

Raymond E (1999), „The Cathedral and the Bazaar: Musings on Linux and Open Source by an Accidental Revolutionary. Sebastopol, CA: O,Reilly.

Roy, W. G., 2004, "Race records", and "hillbilly music": institutional origins of racial categories in the American commercial recording, *Poetics*, 32, 265-279.

Tschmuck, P., 2006, *Creativity and innovation in the music industry*, Springer, Dordrecht, The Netherlands.

Watson, Allan, 2007, Global music city: knowledge and geographical proximity in London's recording music industry, *GaWC Research Bulletin*, 222, <http://www.lboro.ac.uk/gawc/rb/rb222.html>.