PUBLIC AND PRIVATE INSTITUTIONS IN THE GOVERNANCE OF INTELLECTUAL PROPERTY RIGHTS

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Abstract: Based upon a comparative institutional analysis of the institutional frameworks involved in the governance of Intellectual Property Rights (IPRs) systems in France and in the US, both in the domain of patents and copyrights, we demonstrate that the differences of performances among contrasted systems of property rights do not only depend upon the wording of the Law, but also result from the governance mechanisms that implement and complete the Law. In particular we show that there are essential complementarities between public and private institutions designed by the owners of IPRs. Institutions allow agents to reduce the costs of settling and defending exclusive rights of use over intangible goods by collectivizing the related operation. Collectivization can however generate mal-adaptation costs since the management of these rights cannot be customized. We then show that the optimal division of labour between public institutions, private institutions and individuals varies according to the type of IPRs infringement and according to the diffusion strategy used by the owner(s) of the IPRs. We conclude by pointing out that the design of the organization of the institutional frame should be more carefully taken into account when dealing with the optimal design of IPRs systems to solve the protection/diffusion dilemma.

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0. Introduction

The governance of Intellectual Property Rights (IPRs) is becoming a crucial question for economic policies because activities related to intangible resources represent a growing share of our GDPS and a major source of growth. This led several scholars to describe our economies as becoming knowledge-based economies (Foray and Lundval 1996). Indeed, the vast majority of scholars involved in the Intellectual Property field (e.g. Besen and Raskind 1991, Scotchmer 1991, Ordovery 1991, Gallini 2002, Lerner 2002) agree on the idea that the IPR regime strongly impacts on the dynamics of industries that produce or rely on intangible resources because it affects both the remuneration of creative and inventive activities, and the costs of using and transferring the results of these activities. Today, most discussions are concerned with the determination of the most appropriate IPR regime in various situations (e.g. efficiency of the “Droit d’Auteur”2 regime as compared to Copyright in the multimedia industry, optimal scope and duration of patents in contrasted technical fields, respective virtues and vices of “open” regimes as compared to closed ones, optimal scope of the public domain, etc.)

Our contribution comes within the scope of this literature questioning the relative efficiency of alternative IPRs systems. However, it focuses on a different question and is based on a different methodology than most contributions (e.g. Nordhaus 1969, Gilbert and Shapiro 1990, Klemperer 1990, Gallini 1992, Chang 1995). Indeed, rather than restricting our investigation to the rules implemented by the Law, we point out the importance of the devices that govern — i.e. design and implement — these rules. Taking into account the institutional bodies that are hidden by the wording of the Law becomes increasingly important because the legal protection of the work of invention and authorship is tending towards standardization at the international level through the many international conventions: the Bern Convention for the protection of Literacy and artistic works, the Universal Copyright Convention, the Paris Convention for the Protection of Industrial Property, the Technological and Cultural section of GATT and WTO, TRIPS, etc.. Despite this standardization of the wording of Laws (when conventions are actually ratified), the diverse national IPRs systems remain differentiated because laws are implemented differently from country to country. These differences are also found in industry.

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2 As David [1993] reminds us, modern statutory protection of author’s copyright arose in early XVIIIth century England with the Act of Anne (1709). Its aim was to implement a workable regulation since the old perpetual monopoly of printer and publishers was no longer actually enforced. Temporary exclusive copyrights were therefore instituted and were no longer reserved to guild members. Thus since its origin copyright holding is not limited to authors and has little to do with the protection of authorship works. This explains why copyright law, is a “regular” Property Right whose transferability is not submitted to any specific constraint.

The Droit d’Auteur derives from the XVIIIth century Philosophy of the Enlightenment. The author, as a human being, is protected because his work reflects his personality and he shall therefore have rights to control how third parties use his work. The “moral right” (to authorize or forbid any specific use of the protected works) is therefore non-waivable and the author can license the right to use or reproduce his works. Even if a license is granted, the author maintains the possibility of forbidding any specific use of his work.
According to North (1990), one of the essential roles of the institutional framework is to set up Property Rights (PRs). A necessary condition for the efficient use of resources is the definition of exclusive rights of uses over them — aimed at avoiding conflicts and at providing incentives to create and use them efficiently—, and enabling agents to transfer these rights at a low cost to allow efficient reallocation (see also Coase 1992). The general institutions of the society play an essential role in settling these rights. However economic agents must always dedicate resources and efforts to set the boundaries of their rights of use and to exclude unauthorized parties from access to “their” resources (which correspond respectively to the “measurement” and “enforcement” costs defined by Barzel [1990]). This leads them to build devices aimed at governing their rights of access and of use so as to minimize costs.

In this paper, we shall follow the New Institutional Economics (NIE) approach by studying the “division of labour” among various types of institutions. One of our objectives is to point out how the governance of PRs is carried out by the association of public institutions emanating from public authorities, private institutions that are formed by agents that try to collectivize efforts (Brousseau and Fares 2000, Brousseau 2000, Brousseau, Fares and Raynaud 2004), and by the direct intervention of agents. In our view it is important to establish such a distinction between private and public institutions since they are not built according to the same logic (the former are imposed by the State, whereas the latter are freely constituted by agents) and cannot be considered as equivalent from a public policy point of view. Moreover, Private institutions can strongly impact on the properties of Public ones. The paper will therefore focus on the role of private bodies and on the complementarities between private and public institutions.

From a methodological point of view, we perform comparative institutional analysis because, when it is question of governance, it is difficult to refer to an ideal world populated by rational decision makers and without radical uncertainty. This is in line with the methodological statement of NIE (Coase 1992, North 1990, Williamson 1996), which is particularly relevant when one deals with creative and innovative activities. This paper is thus based upon the comparison of various systems of governance of IPRs. Dealing with the institutions that govern the patent system and the copyrights system both in France and in the US, we try to point out that the differences between the diverse systems do not only depend upon the wording of the Law, but also pertain to the governance devices that manage and complete the Law. As a result, there are also unexpected similarities among these various systems, and legal backgrounds.

We illustrate our arguments by comparing

- the US and the French institutional frameworks because both systems are archetypal of the two dominant legal regimes in the world — the common law and the civil code (or statutory legislation) —, which relies on a number of contrasted principles. There are in addition key

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3 Palmer (1989) or Shapiro and Varian (1998) highlights the available methods that substitute IPRs to protect and valorise innovation, either though contracts (leasing contracts, professional agreements, etc.), protection methods (entry fees, technological protections, bundling...) or commercial strategies (first to market, price discrimination, alliances, exclusion pre-contracts based upon the revelation ex ante of consumers’ demand).
differences that are specific to Intellectual Property. It is especially the case for property regimes over works of art and creation of mind where the French “Droit d’Auteur” contrasts with the US Copyright (see note 2)4.

- two categories of intangible goods: technological inventions (protected by patents) and works of authorship (protected by copyright) because they correspond to different types of intangible goods (“ideas” and “expression of ideas”) that are often characterized by contrasted diffusion policies (from pure exclusivity of use to unrestricted diffusion) and because the logic of IPRs infringement can differ (as developed later).

Taking into account these contrasting IPRs regimes allows us to compare a broad set of situations for which (private) institutions matter.

Before focusing on the role of private institutions, we present the theoretical framework (1) and explain what “governing” an Intellectual Property Rights system, means (2). This will lead us to point out why Public Institutions set “incomplete” Property Rights, that force agents to bear high costs to settle rights of use over intangible goods (3). Agents are therefore incited to minimize these costs, by collectivizing the governance of their exclusive rights of use to benefit from economies of scale and scope, and of learning effects (4.1). However, collective management of rights has disadvantages (4.2), which limit the ability to collectivize the governance of their IPRs. This ability depends in particular upon the nature of the resources they want to protect and of their strategy in making the most of these resources (4.3). In addition, they can also play on the scope of specialization (5). Our concluding remarks will be dedicated to the identification of different IPR regimes given their implementation by diverse configurations of governance devices rather than through the wording of the Law (6).

1. **Analytical Framework: Public and Private Institutions**

This paper is dedicated to the assessment of the relative efficiency of the various types of governance devices that play a role in IPRs settlements. We will focus essentially on formal institutions as defined by North. However we will not reduce institutions to a set or rules as North (1990) does. We agree with the idea that institutions are those devices that constrain agents' behaviour, and thus decide the “rules of the game” in which individuals develop their strategies. However these constraints result from a combination of “rules” and of “decisions” made by “Institutional Organizations” (Brousseau 2000). These Institutional Organizations play three roles. They make these rules enforceable. Put another way, they perform various operations to transform these rules into the behaviour which agents adopt. Enforcement does not only mean constraining the agents. It also means observing behaviours so as to compare them with the rules,

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4 In the same time our analysis will lead us to point out that, while the wording of the law is contrasted under the two legal regimes, the actual practices of producers and users of intangible goods can be made similar, in particular because private institutions complete the incompleteness of the public ones and allow to implement orders adapted to the transactional constraints that derive from the types of traded intangible goods, from the inventor’s strategy to valorise their creation, etc.
making the rules known to the players, etc. Secondly, Institutional Organizations design the (formal) rules, either by providing interpretation means when the rule is vague and ambiguous, or by designing additional rules. The set of existing formal rules is to a large extent the activity of previous institutional organizations. Thirdly, Institutional Organizations make decisions and state the required behaviour by parties when rules do not apply. In our opinion, institutions are therefore made of a combination of rules and institutional organizations that impose constraints on agents so as to frame their behaviours; the main goal of these constraints is not enable them to coordinate.

When they need to coordinate, agents can rely on three (constitutional) types of coordination device (Brousseau 2000). First of all, they can rely on Public and General Institutions instituted by the State as the Law, the Patent Office and the Judicial System. These “Public and General” devices rely on the State’s power of last resort, and therefore impose their order to all agents acting under the relevant State’s sovereignty. Secondly, agents can rely on “Private and Specialized” Institutions voluntarily created by agents who want to share the costs and the efforts of governing their interactions5. This is the case, for instance, when Professional Associations set common rules of interactions among the members of a community. These common rules make it unnecessary for agents to write complex contracts. The resulting private collective order relies on voluntary adhesion and the related “Institutional Organizations” — like mutual societies of authors — derive their “power” from the fact that their members delegate them authority. Acceptation of the private order draws from the fact that members make savings when coordinating with others, despite the cost of the constraints. Thirdly, since public and private bodies do not always solve all the coordination difficulties, economic agents can implement inter-individual contracts aimed at settling a Governance Structure in the sense of Williamson (1996). We will refer to these as “Interindividual Governance Structures”.

When they need to coordinate, agents have to decide to resort to a central solution provided by “Public and General Institutions” (PGI) or to a decentralized one based on “Interindividual Governance Structures” (IGS), or to an intermediary one. Their choice depends upon a trade off that can be summed up in terms of degree of (de)centralization. Relying on PGI allow them to benefit from low costs of governance of their transactions for two reasons (Brousseau and Fares 2000). First, by avoiding redundant efforts to settle coordination rules, these general institutions benefit from economies of scale and scope. Second, agents usually do not bear directly the costs of resorting to these solutions. On the contrary when they use IGS, agents bear directly the costs of

5 All along the paper we will contrast Public and General Institutions and Private and specialized ones. Of course we recognize that Public Institutions could be specialized and that private institutions could be involved in the solving of very heterogeneous coordination problem. However at first instance it seems relevant to consider that public institutions are, everything equal, less specialized than private one, since their scope is intrinsically wider. They apply to all coordination problems to be solved in a given jurisdiction; while private institutions result from the will of agents who face common coordination problems to solve them jointly (so as to reduce coordination costs). By constitution private institutions are more focused and therefore more specialized (see also section 5).

The analysis could however be refined by contrasting along an axis on which focus and voluntary joining would increase: Public and General Institutions (e.g. Contract law), the Public and Specialized Institutions (IPR system), then Private General Institutions (e.g. Trade Association), Then Private and Specific Institutions (Patent Pool).
governance. However these economies have a cost: a lack of flexibility and of adaptation to their specific coordination needs. These costs corresponding to the notion of “mal-adaptation costs” as defined by Williamson (1985). The solutions that are designed to solve the most common cases (or which correspond to the lowest common denominator) of contrasted coordination problems do little to solve these problems and result in losses (e.g. disputes, low performance, etc.), while customized solutions minimize mal-adaptation costs. General and public institutions result therefore in low governance costs and high mal-adaptation costs, while contracts result in high governance costs and low mal-adaptation costs. Private and Specialized Institutions that take from both logics of coordination devices (they are voluntary — as contracts — and collective — as general institutions) result in medium costs for both categories since specialization reduce economies of scale (as compared to general institutions) but mitigate mal-adaptation.

At a specific moment of time — in the strategic space of economic agents — Public and General Institutions of the Society are given in the sense that agents can hardly impact on their features. They therefore try to reduce coordination costs by settling contractual agreements that reduce the level of governance and maladaptation costs resulting from the design of the public and general institutional framework. However, this can lead them to face excessive governance costs. They therefore pool coordination efforts, by building private and specific institutions, so that they can benefit from economies of centralization.

Consequently, coordination always results from the combination of the recourse to two contrasted types of institutions — the Publics and General ones, on the one hand; the Private and Specialized ones on the other hand — and of (bilateral) contractual agreements. Agents try to maximize efficiency (or minimize transaction costs) by designing private institutions and settling contracts so as to benefit from the most efficient possible ones; and by adequately combining these various coordination devices.

2. **Settling Intellectual Property Rights**

According to Barzel (1989) and North (1990) a PRs system is a set of rules and mechanisms that delimits rights of uses over economic resources and allocates them to decisions makers so as to enable them to take economic actions. It is based, first, on a delimitation of these rights — consisting in setting the frontiers among different ways of using resources and among regimes for appropriating the output of these uses — and on a process of allocation of these rights — that are granted to individuals or groups. These operations are qualified as “measurement” by Barzel and they generate measurement costs. Second “enforcement” mechanisms implement these rights of uses by excluding every untitled agent from access to the protected resources, or from capturing the output of its use. This refers to controlling access, supervising uses, granting authorization for uses and punishing unauthorized uses (either to get damages or to dissuade potential infringers) and generates “enforcement” costs.

The “measure” and the “enforcement” of property rights can be performed by either the public and general institutions of the society, or by private and specialized institutions, or by the agents themselves. In actual fact, they are performed jointly by the three types of instances given the optimal mix of advantages and costs of centralization (as pointed out in section 1). Indeed, if
property rights were measured and enforced by the agents on a decentralized basis only, the community would be deprived of economies of centralization. In addition, negative externalities would occur because a decentralized self claim of exclusive rights of use would result in conflicts and in excessive private capture of public goods (Brousseau, 2004). On the contrary, if the measure and enforcement of property rights was performed centrally by the Public and General Institutions only, it would result in inefficiencies, because of excessive mal-adaptation costs. In addition it would lead to an excessive protection of property rights since the costs of securing exclusive rights of use would not be balanced by the evaluation of the marginal utility to protect (while when individuals bear protection costs, they inevitably compare costs with benefits).

Public Institutions are therefore essential in participating to the measure and the enforcement of property rights, but they necessarily set up “incomplete” property rights, since it leaves to the agents the responsibility to (partially) bear the costs of establishing and defending their exclusive rights of use. They have therefore incentives to do so when it is of economic value only. This contributes to an “optimal” level of protection (which is therefore incomplete). Then economic agents can decide to minimize the costs associated with measurement and enforcement by collectivizing their efforts in creating private institutions aimed at contributing to settle property rights.

To be more precise, it seems necessary to establish a distinction between the diverse underlying operations under the measurement and enforcement terms distinguished by North (1990).

- PR measurement implies two essential operations: the delineation of rights of use (so as to avoid, in particular, overlaps among them), and the identification of the owners of intangible goods (that should be clearly established so as to minimize ex-post conflicts over the use of resources). The delineation of the scope of PRs impacts on transaction costs: too narrow rights of use multiply transactions, but rights of use which are too wide lead to under exploitation of resources — and on the alignment of private incentives with the collective interest

- According to French Law, which derives from Roman Law, property rights are composed of three sub-categories of rights: “Usus” is the right to (exclusively) use a resource; “Fructus” is the right to benefit from the goods and services that are produced thanks to this resource; “Abusus” is the right to waive the resource. One can be inspired by these three categories to point out the diverse operations required to enforce property rights.

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6 For two reasons. A resource would not be used the many ways it can be simultaneously used, if no specific rights are associated to each of these uses, since multiple users would mean multiple ownership and negotiated use of a common resource that can be costly and inefficient. Second if rights of use are bundled, transferring property rights to a third part can result in a too high price for the buyer (who is interested only by a sub-set of possible uses), and might be too risky for the seller (who would eventually prefer to control how the asset will be used ex-post by the buyer), resulting in non-occurrence of trade.

7 First externalities are directly depending upon the scope of PRs. Second non-rival resources can be inefficiently captured by private interest if exclusive rights of use are not bundled.
First, by referring to the “Usus” notion, it is necessary to perform operations to implement one’s right to exclude any third party from the uses of the protected resources. This implies two types of operation. First, a supervision effort has to be made to detect unauthorized uses. Second, infringers have to be obliged to stop (and possibly to compensate for the losses borne by the owner of intangible goods).

Second, by referring to the “Abusus” notion, it is necessary to perform operations to enable third parties to use the protected intangible resource when its owner wishes to do so. This implies granting authorizations of uses. It consists of designing arrangements with users that precisely delineate their rights and duties.

Third, by referring to the “Fructus” notion, IPR enforcement implies the transfer of revenues from the users to the owners of intangible goods when third parties are authorized to use a protected intangible resource. This requires a control of the actual uses of the resource and fee collection operations.

To go further in the analysis of the optimal design of the institutional framework that govern IPRs, we need to analyze how these various tasks are performed by public institutions, private one and agents (thanks to bilateral contracting).

3. The Incomplete setting of IPRs by Publics Institutions

“Because with any property rights structure transaction costs are positive, rights are never perfectly specified and enforced; some valued attributes are in the public domain” (North (1990), p. 33). North developed these ideas with reference to PRs over tangible resources. We think that this incompleteness is even greater for IPRs because it is harder to define rights to use, exclude or benefit from the fruits of intangible resources.

In a related paper (Bessy and Brousseau 1997), we analyzed why the formal patent system implements incomplete PRs:

- The delimitation of IPR is incomplete because of three reasons. First, the description of the invention in the wording of the patent — the codification — is necessarily incomplete This is due to the boundaries of the human language that cannot completely grasp the very nature of knowledge that is partly embodied in human skills, organizational routines and equipments. It is also due to the strategic behaviour of inventors who often do not disclose all the details of their inventions to protect them though secrecy (because they anticipate the imperfect legal protection). Second, the claimed protection — the patent scope — is irremediably unclear. Since technology is constantly evolving it is difficult to anticipate with certainty all the actual

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8 One can consider that the “Illegal uses detection” mentioned above to guarantee the exclusiveness of use is also dedicated to the supervision of authorized users. Indeed to detect illegal uses and to check if the authorized users do not infringe their rights the same type of investigations are required. This is however different with the supervision of the intensity of uses (see below).
materialization and implementation of a technical principle\(^9\). Third, the technical universe is so complex that it would be prohibitively costly to gather in the Patent Office the required skills and information to perform an efficient *ex-ante* control guaranteeing that no overlap exist between a given claim and a pre-existing (patented or not) invention. An *ex-post* control based on contradictory debates in Courts is resource saving, since it enables public institutions to control only a minute part of the registered patents, and courts get free access to the expertise of the prosecutor and of the defender (see section 5).

- Public institutions also incompletely enforce IPR. This requires a complex evaluation of technical realizations in order to detect patent infringement. It would be prohibitively costly to require from a central administrative body the systematic evaluation of all technical devices. This body would also come up against the difficulty of gathering together the needed cognitive capacities to efficiently cover all the technical fields. That is why the supervision of patent infringement is delegated to patentees that have to detect infringers and to bring cases before the Courts by themselves. As pointed out above, Courts, moreover, rely on the expertise capacities of economic agents to settle infringement disputes.

For works of authorship, the measurement and enforcement difficulties are similar to those associated to patents if one establishes comparisons with PRs over tangible resources\(^10\). Interpretation problems are however weaker, since it is the form of expression that is protected, not the “parent idea”. Property rights on the works of authorship are not, however, systematically and completely measured and enforced by public institutions.

- There is first a measurement boundary that is related to the management of a central registration system for title deeds. Such a system is essential to the working of an IPR system. Without it, it would be prohibitively costly for a producer to check if he has not recreate an already protected work. Users would not be able to know easily if the resources they use are in the public domain. Moreover, the identification of the owners of protected works would be prohibitively costly. However, works of authorship are so numerous that it would be excessively expensive to systematically and freely register all of them. In the copyright

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\(^9\) That is why the “equivalent doctrine” is central in the patent infringement jurisprudence. This states that the patent covers not only the precise realization that it describes, but also the technical realization that differs from it only by the substitution of technical components that can be considered as equivalents (M. de Haas 1975). As a result, a patent claim is complex to interpret.

The incompleteness of PRs is reinforced because the knowledge incorporated in a Parent Idea can generate the production of new (patentable) knowledge. The resulting tangle of PRs generates much fuzziness in "usus" and “abusus” rights. Moreover, the patent claim often covers applications that have not already been developed or tested. There are often gaps between the claimed protection and the actual realization. A parallel between these and North’s observations (1990) must be established. Indeed North points out that the more uncertain (both quantitatively and qualitatively) the flows generated by an asset, the more difficult the delimitation and allocation of PRs.

\(^10\) “Copyright Laws tend to be rather vague and, once enacted, become subject to a wide range of interpretation by the courts where oversimplification and a misunderstanding of even the most basic elements of a musical structure are common. And finally, in order for the legal framework of copyright to become the basis for a realized economic right, it must be implemented by various institutions — including government agencies (copyright tribunals), collective bodies (performing and mechanical right societies) and others — where the day-to-day business of negotiating the monetary value of musical works and their use actually takes place (Theberge 1993, p. 41)
system, copyright holders have to voluntarily register their works at the Copyright Office (otherwise their title deeds cannot be legally defended). *Droits d’Auteur* are incompatible with a registration process because no one can be obliged to claim “natural rights”. There is therefore no systematic registration process\(^1\). Thus, both in the US and in France, public institutions do not ensure a complete “measure” of property rights over works of authorship.

- There is a second measurement problem that is linked to the “fair use doctrine” (“droit de courte citation” in *Droit d’Auteur* law). For practical reasons, but also to preserve freedom of expression and creation, the reproduction without explicit authorization of a part or of an entire work of authorship is permitted in certain conditions. A writer can quote another writer, a musician can be inspired by a theme created by another composer, the user of a record or software can duplicate it for safety reasons and for private use, etc. These various minor infringements to the wording of the law create many ambiguous situations where it is difficult to judge the fraudulent character of a quotation, or copy, or public performance of a protected work. Thus copyrights are property rights whose boundaries are ambiguous.

- Third, enforcement problems arise. As in the case of patents, the cost of a centralized systematic detection of IPR infringements would be prohibitive given the tremendous number of daily uses of protected works of authorship. Moreover, central detection would generate problems of interpretation because of the ambiguities mentioned above.

In addition to these arguments, the non-rival nature of information has to be taken into account. In order to incite inventors to innovate, authors to create, and entrepreneurs to finance their activities, Public authorities have to create the framework of an IPR system. However, they have to *ex post* favour the diffusion of inventions and works of authorship since they are non-rival goods. Moreover, it is not in the collective interest to favour the constitution of monopolies and dominant positions. In that context, it can be considered as efficient to create a minimal framework that sets up IPR principles, and let potential owners of intangible goods pay for making their rights of use effectively exclusive. This favours, everything remaining equal, diffusion since authors and inventors will not exercise their exclusion rights for those creations that do not have a high economic value. It eases also the diffusion of works that are not created according to a rent seeking logic. At the same time, it creates high incentives for authors, inventors and entrepreneurs to dedicate means to produce radical inventions and major creations. Moreover, the fact that they bear the costs of measuring and enforcing their IPRs leads them to limit their efforts to prevent leakages and incite them to create efficient structure to govern IPRs.

With regard to IPRs, a minimal level of public intervention is therefore necessary. It consists, first, in creating a minimal framework. This leads to the promulgation of an IP Law that establishes the principle of IPRs and enables the general judicial system to settle conflicts. The second necessary intervention is the management of a registration system. A unique and free

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\(^1\) When there is no centralized public registration system, private registration emerge. The SACEM does that in France for music pieces. Arrunada (2003) shows that private registration emerges also for tangible property, while private and decentralized solutions can be less efficient than centralized ones.
database centralizing all the claims for exclusiveness is essential to avoid overlapping among claims and unintentional infringement. At the same time, Public authorities could be led to check the costs vs. benefits of claims for exclusivity on non-rival resources to solve optimally the protection diffusion dilemma. In particular, when expected positive effects of diffusion are strong, Public authorities are likely to avoid the emergence of monopolies too wide in scope. This is typically the risk with technological monopolies that can slow down innovation. That is why public institutions are more strongly involved in the measurement of patents than of Copyright. While Patent offices do not control the validity of claims perfectly¹², their role is to restrict their scope. The copyright office does not perform that task, which is eventually done ex-post by courts when conflicts occur.

4. The Private Institutions Trade-off

Public Institutions do not set complete IPRs because it would be prohibitively costly, while at the same time economies of scale, scope and learning seem to occur in the performing of certain tasks related to the enforcement of rights (4.1). Agents are therefore incited to create private institutions responsible for making these economies in settling their property rights over intangible goods. One can however wonder why the whole governance of IPRs is not fully taken charge of by these private institutions. In our view, this is due to two causes. First, collective governance mitigate IPRs (4.2). Second, the trade-off between collective and individual governance is not in all circumstances in favour of private institutions (4.3).

4.1 The Benefits from Collectivization

Since public institutions do not set up a complete IPR system, owners of intangible goods must perform an important part of measurement and enforcement operations. However, many redundant operations are required to govern different intellectual title deeds, and since these operations require common expertise and means, there are potential economies of scale, economies and scope and learning effects in collectivizing the performing of these operations¹³.

¹² It must be pointed out, however, that patent offices might have biased incentives to efficiently control the validity and scope of claims, since they can be considered as profit making entities. Indeed the revenues from patent offices directly draw from the registration fees paid by the innovators registering patents. It might influence the willingness to reject claims and to proceed to tough examination process. In the same time, in the long run, a patent office might also consider the reputation effect. If it grants patents after a serious examination process, the patents he will issued will be considered as of high quality because they will be hard to contest in courts. Intellectual title deeds owners will therefore consider the cost born ex-ante (positively correlated to the length and the complexity of the process) with the quality of the protection (and therefore the cost to be born ex-post in case of judicial conflict, including the cost of uncertainty).

¹³ Although it is quite difficult to evaluate this type of economies, one can point out that in France the SACEM that manages authors’ and editors’ rights is also a subcontractor for the other rights management and fees’ collection societies that represents producers, performing artists and musicians. Indeed, while the SACEM was created in the XIXth century, the other societies were created in 1985. The former developed its own supervision capabilities. Since there are economies of scale, scope and learning, the later have preferred to subcontract their supervision and investigation efforts to the SACEM. In the US, Copyrights’ owners also recognize the existence of such economies
• Economies of scale arise because the supervision of users and detection of potential IPR infringements are largely independent of the specific features of each protected piece. Moreover, there are potential large transaction costs economies when transactions are performed over a title deed portfolio rather than piece by piece.

• Economies of scope: when a set of agents decide to coordinate their efforts in governing their property rights, they can reach the critical mass in the performance of each operation that is needed to actually measure and enforce rights. They can also specialise resources. This allows them to dedicate the saved resources to perform additional operations in order to extend their scope. In concrete terms, when a collective governance device manages a title deed portfolio, it can extend defence efforts to markets and uses that otherwise would not be targeted by individual owners of intangible goods.

• Learning effects draws from learning by doing occurring when investigation, negotiation, and fee collection operations are repeated. Learning benefits are also linked to the division of labour that allows specialization. Therefore, the wider portfolio of title deeds to govern and the larger the organization in charge, the stronger the learning curve.

These diverse potentialities incite the emergence of private collective governance devices that manage portfolios of title deed by detecting IPR infringements, and negotiating uses authorizations and remuneration principles. They can also fix general terms of contracts (and even norms of interactions among agents) to reduce negotiations costs.

4.2 The Mitigating Effect

By reducing individual measurement and enforcement costs, these private institutions make IPRs stronger. At the same time collectivization leads to the mitigation of the actual properties of the property rights as they are designed by the wording of the Law (4.2.1). Information costs are to a large extent the cause of this mitigation (4.2.2).

4.2.1 Collective Management and IPR Mitigation

To actually benefit from economies of scale and scope, the collective management of IPRs, and especially of enforcement, requires a common policy by the owners of intangible goods. Indeed, if owners would grant diverse users with customized rights of uses at customized prices, many of

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since they rely on fees’ collection societies to gather the revenues generated by their IPRs especially in the case of public performance of them.

Let us remind the readers that

• In France the Société des Auteurs, Compositeur et Editeurs de Musique (SACEM) is the only collective society responsible for the collection and distribution of revenues associated to the works of authorship in music. There are also societies involved in the management of the “neighbouring rights” of performing artists: the ADAMI is in charge of those of the singers and musicians (which names are printed on the record label); the SPEDIPAM manages the rights of the “anonymous” orchestra musicians.

• In the US there are three authors’ societies: The American Society of Composers Authors and Publishers (ASCAP), that is the most important, Broadcast Music Inc. (BMI), and The Society of European Stage Authors and Composers (SESAC), the smaller.
the economies generated by the collectivization would be lost. In actual fact, collectivization really leads to a mitigation of the sovereignty of IPR owners since it often makes it impossible to really discriminate the various users when there is a large number of them.

For instance, collectivization often leads to the implementation of statutory license regimes (“licence légale” in France). Thanks to statutory licenses, any potential user can use the protected work without requesting authorization from the owner. In turn he has to pay a statutory licensing fee. This saves the costs of managing authorizations for each specific use of each protected piece. In the case of music, statutory licenses draw on the impossibility to actually apply the rights granted to authors to authorize or forbid the uses of their recorded/published works because of the tremendous number of possible uses by a vast amount of users (private users, but also broadcasters, discos, managers of public facilities, etc.)\(^\text{14}\).

Such general authorization regimes prevents owners of intangible goods from exercising their exclusion rights. In addition, they do not benefit from the actual revenues of their asset. The collective governance device in charge of gathering revenues does not negotiate uses fees work by work. This would annihilate most economies of scale in bargaining. It claims for a general fee for the use of its portfolio without checking how each piece is actually used. Irrespective of distribution rules, the collected fees do not therefore correspond to the actual revenues generated by each individual invention or work of authorship. As a result, inventors and authors do not get revenues in relation to the actual use and value of their creation when they rely on collective governance.

This second effect can, however, be alleviated by the management of a “per use” fee system. Such a system is highly preferable for owners of most successful creations because they can benefit from the revenues actually generated by their work\(^\text{15}\), without any deduction being made

\(^{14}\) In fact, in the music industry externalities as well as transaction costs led to the implementation of compulsory general licenses by public authorities. Parliaments, and therefore the wording of the Law, have defined a principle of general statutory license for the use of recorded material. Any record is therefore considered by the law as licensed to any user or broadcaster (in certain conditions) who have to pay a fee to copy it ("fair remuneration of private copies" in France) or to broadcast it according to rates that have been decided either by the Parliament or by negotiations among organizations representing, on the one hand the users, and on the other hand the owners of intangible goods (unions, collecting societies, etc.).

\(^{15}\) Since the origin of broadcasting network till 1941, such a system of flat rate licenses — blanket license — was used to limit transaction costs. Such a license authorizes the licensee to display any work of the licensor’s repertoire in exchange of a fee (generally indexed on licensee’s sales) that does not depend upon the type and the quantity of music actually played (Bloch \textit{et al.} 1997). Since such practices have been considered as anticompetitive since 1941, broadcaster have benefited from program licenses (1941 for the radio-broadcasting, 1950 for the TV broadcasting). These licenses provide the licensee with a general authorization to use any work of their repertoire, but fees are calculated only on the licensee’s revenues affected by the licensor’s repertoire. That said, most licenses remain blanket licenses today because they are less expensive to manage. There is however an increasing number of program licenses. Broadcasters seek to make their relationship with collective bodies that represent copyrights’ owners more balanced. They even try to directly conclude “source licenses” with copyrights owners. Specialized companies (such as Music Report) developed investigation and information systems that enable them to precisely count each playing of a work and calculate the generated revenues. These systems considerably
by the other members of the pool. This ability is, however, linked to information costs that are themselves influenced by technology.

4.2.2 IPR Mitigation and Information Costs

The mitigation of IPRs which becomes apparent when they are managed by collective bodies is strongly linked to information costs. This is well illustrated by the potential impact of Information and Communication Technologies (ICTs) on the management of patented and copyrighted works of mind. By enabling a fine tracking at a low cost of any use of intangible assets, these technologies potentially enable the restoration of a customized management of at least royalties collection and authorization granting.

Digital information dissemination systems, like Internet, do not only provide patent and copyright holders with new opportunities to diffuse their resources, they also enable them to obtain better control of the uses of their material. Ex ante, they can encrypt data files to prevent unauthorized uses and copies. Ex post, it is also possible to keep track of every use of a protected asset and to identify who (at least what computer) processed it. This “revolution” in the ability to control rights of use thanks to ICTs is now analyzed in many papers among which Lessig (1999), Lemley (1998) and Brousseau (2004) can be quoted since they point out how the principle of IPRs per se is questioned. ICTs can be used to strengthen or bypass the current IPRs system, and challenge the economics of the system\(^6\). This leads to the possibility of developing new types of broadcasting and diffusion systems that enable a more customized management of IPRs (often qualified as Digital Rights Management (DRM) systems). For instance, in the music industry, several companies are currently implementing “pay per downloading” systems (which might even discriminate between “pay per listening” and “pay per copying”). These systems allow users to download digital files. There are also digital radio channels that, when they are not free, may charge the listener according to what he actually listened to. In these types of systems, it is very easy to know exactly the intensity of “use” of each copyrighted work. This leads to the possible diversification of licensing agreements, since statutory licenses are no longer the sole workable solution. As in the case of “source licenses” in music, on-line broadcaster can directly negotiate licenses with copyright holders both to bypass collective societies and to not enforce collective agreements about the level of licenses fees. They can also negotiate voluntary collective licensing (IP and NII 1995).

\(^6\) ICTs can bypass the IPR-based system to share music as it is done in P2P communities where gift/counter-gift is the basis of exchange. Such principles raise however a problem of long term viability since the incentives to create might be low in a system where the “consumers” do not make any transfer to the creators. The remuneration of the later category could however be based on the sales of derived products, on the selling of the attention of “audience” to third part, on voluntary transfers by the community of “consumers” that might accept to fund the provision of a public good, etc. Moreover, intrinsic motivations (e.g. the seek for fame or the simple desire to create) could also be strong enough to motivate creators. On the economics of P2P see Krishnan et al. (2004).
In fact, all these technological solutions enable the easy identification at a relatively low cost of pieces of protected works, their users and owners. It potentially facilitates the remuneration of authors, inventors or copyright holders according to the actual exploitation of their pieces of work. The major effect is, however, to enable the unbundling of the various operations associated to transactions over intangible goods: “control of actual uses of authorized uses”, “authorization management”, “money gathering”, etc. In particular, the former can remain centrally managed by specialized bodies since there are strong economies of scale, scope and learning, while the latter can be more decentrally managed by owners of intangible goods (who could continue to prefer collectivization in some cases) to reduce the mitigating effect pointed out in this section. This is confirmed by the analysis made by Paris (1998) on the evolution of the devices of collective governance of IPRs in France.

4.2.3 Pooling means, Managing risks

So far we have not dealt with the way commercial risk can be managed by collective bodies. There are several ways of paying authors or inventors when their IPRs are collectively valued. Two extreme cases illustrate them in the case of works of authorship.

- On the one hand, the collective body can act as if it was a “transparent medium” between the users and the owners. This means that it tries to collect all the revenues generated by each intangible asset and transfer them back to each owner (its cost deduced). This requires a huge supervision effort since the collective body has to identify every use of each protected work. SACEM, in France, is a good example of this way of operating. Its different investigation means concentrate on the estimation of the uses of each type of work of authorship and collected revenues are shared according to the observed uses of each piece of the repertoire\(^{17}\).

- On the other hand, the collective body takes charge not only of the gathering of generated revenues but also of the enforcement of the risks associated with the valorisation of the intangible assets and to the collection process. This happens when the collective body pays the owners of intangible goods through an *ex-ante* lump sump payment (*ex-ante* meaning before revenue collection) and is the residual claimant for all the generated revenues. To a large extent, Major Companies correspond to this case. By employing authors or by acquiring works of authorship from freelance authors for a lump sum, they typically bear the risk of valorisation of the work of authorship\(^{18}\).

\(^{17}\) However, the SACEM is not a pure medium since it does not estimate the revenue actually generated by each work of authorship. For instance, when SACEM collect royalties fees in disco, restaurants and other public places, it cannot estimate how each pieces of its repertoire impact on the sales. It therefore collects a fee for the use of music in general and then shares the collected sums among the authors according to the relative intensity of their uses. This is indeed a way to approximate the revenues generated by each piece, but it is not a perfect way.

\(^{18}\) Major Companies collect by themselves the copyrights fees generated by their repertoire through licenses set up with users like broadcast channels. However, they can quasi sub-contract some aspects of fees collection to collective copyrights management companies. This is for instance what they usually do to collect fees generated by public performances of work of authorship. This complexify the simple framework described above, because the two types of institutions play a role in the collection of fees. However, it is clear that authors do not only collectivize the gathering of their revenues. They also pool (and waive) their risks.
Obviously, the latter case is an extreme case of “collectivization”, since the collective body becomes the property rights holder. But there are similar cases in which there is no actual property right transfer (and therefore a lower level of risk bearing by the collective body). The US royalty collection societies in music are examples of such an intermediate case. These societies neither pay \textit{ex-ante} lump sum payments to copyright holders, nor pay according to the generated revenues. Instead, they pay fees that are linked to some measure of the success of pieces (essentially based on charts) but that are statutory and independent of the collected fees. They thus do not share the collected fees among owners of intangible goods. They are the residual claimants of all the collected revenues, but pay the authors according to their relative contribution to those fees. This incentive mechanism incites owners to join the society (or to continue membership of it) instead of valorising their works by themselves, and to produce valuable works.

It must be pointed out that the two extreme logics of managing risks and authors’ remuneration do not provide the collective bodies with the same incentives to collect fees. The “transparent medium” shares the collection costs with the authors. Its marginal costs of collection are therefore lower than those of the “risk bearer” since the latter bears the whole collection costs. It therefore leads to smaller revenues than the “transparent medium”. This is probably one of the reasons why the scope of SACEM’s collection effort is wider than that of the US collection fee societies\footnote{In the French music industry SACEM has developed means of investigation that enable it to perform a quasi systematic investigation into the actual uses of protected works on each broadcasting network, in each music theatre, disco, etc. It has also developed means of assessing the private reproduction of records on tapes. These means of evaluation are dedicated to the gathering of licenses fees that otherwise could not be systematically collected. Although this type of comparison must be carefully manipulated one can compare the revenues collected by the US copyrights fees collection societies with those collected by the French ones. As compared to its US counterparts, the SACEM collects copy or display rights in many “niches” (such as discos, restaurants, stores, etc., where music is played). It allows SACEM to collect fees that are above 80\% of the fees collected in the while the US population is four times larger than the French and the GDP more than 6 times larger. This huge “productivity” gap cannot be entirely due to the fact that the French DA Law is more favourable to authors than the US Copyright Law. Moreover, it is difficult to rely it to the SACEM’s market power. Indeed on each market, the SACEM does not collect higher fees than its foreign “sisters” companies. The originality of the French collection system lies in its ability to collect royalties on almost every category of music users. In the US copyrights collection societies target the less costly users to identify, to supervise and to tax}. Although it is difficult to obtain accurate data, one can imagine that the “transparent medium” solution provides authors (who have to be risk lovers) with higher revenues than the “risk bearer” system. However, the latter should ensure a better allocation of collective resources than the former because it prevents too intensive collection effort and favours diffusion (since many marginal uses of intangible assets are free).

\section*{4.3 Factors favouring the recourse to private institutions}

Before analyzing how various tasks associated with the management of IPRs are taken charge of by diverse governance devices, it is useful to point out the diverse factors that favour a collective management of these rights. Indeed, measurement and enforcement operations do not require the same type of capabilities. Moreover, there are various types of property right infringements that
do not require the same level of expertise to be contended. In this section, we will therefore point out three categories of factors that influence the ability to collectivize IPR enforcement efforts and means:

- The first is related to the behaviour of users that can infringe IPRs in different ways (4.3.1).
- The second is connected to the very nature of the assets that are protected (4.3.2).
- The third is correlated to the behaviour of Intellectual Property Owners (owners of intangible goods) whose diffusion policies also influence the ability of collective bodies to take charge of the defence of IPRs (4.3.3).

This will help us clarify the type of task that can be collectivized and establish a link between the obviousness of IPR infringements and the ability to collectivize their defence.\(^{20}\)

4.3.1 Users’ Influence: The Various Modes of IPR Infringements

There are at least two ways of infringing IPRs and collective governance devices are not necessarily equally efficient in dealing with both of them.

- The “servile copy” (to use the French Law categories) consists in duplicating or using an unauthorized copy of a protected intellectual work. It can also consist in displaying it to the public without authorization. This work can be either a technical realization, or a work of authorship, and the copy can be made either by the user or by a third party. Since it is a question here of a “line for line” duplication (or display) of the protected material, it is quite easy to note and certify the rights violation in order to claim either for the payment of royalties (and possibly damages), or for the suspension of the use (and possibly the destruction of the copy).

- “Plagiarism” consists in drawings one's inspiration from an existing work to produce a new and original one. In this case there is only a partial duplication of the protected initial work. This partial copy is, moreover, incorporated into a new and different work that can incorporate actual innovations and original creations. IPR infringement is therefore much harder to collectivize because it requires specific knowledge of each of the features of each protected work. In actual fact, it is essentially the authors or the innovators who know their creation well enough to detect plagiarism efficiently (Bessy and Chateauraynaud 1995).

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\(^{20}\) Most of the literature generally considers that the PR regimes governing the works of authorship enable a wide collectivization of IPR governance, while the patent system does not. It is generally argued that this is because it is easier to collectively protect forms than ideas because interpretation margins are less strong in the former case than in the latter. While we agree that there are strong differences between the two domains, it seems to us that the demarcation line is much more subtle. The ability to collectivize the governance of IPRs does not depend upon the nature of the legal rights only. It also depends on the various governance tasks and on the type of protection that is sought by the owner of intangible goods.
As a consequence, defence against plagiarism is much more complex to carry out at a collective level since it requires a close knowledge of what is plagiarized, which is not the case for servile copies that require a way to recognize salient features of the copied material only.

Servile copy and plagiarism can be performed on technical realizations as well as on works of authorship. There are thus potentialities for and obstacles to the collective management of both patents and copyrights. However, the potential of both forms of IPR modes of infringement is not equal for technical realization and for works of authorship. Since it is the form of the latter that is protected, they are relatively more intensively submitted to servile copies. For instance, in the music industry most copyright infringements are performed through the public display or through the duplication of a particular recorded performance of a piece of music. The cost of reproduction is very low and there is a little difference, for the user, between the value of the copy and the value of the original one (Besen and Kirby 1989). This is basically why collective bodies play an important role in the enforcement of IPRs. It must be pointed out, however, that the various authors’ rights management societies that exist either in the US or in France do not take charge of the detection and combat of plagiarism. Therefore they do not arbitrate upon conflicts between authors. It is the same for the associations — like the Business Software Alliance or the Software Publishing Association — that have been created at the international level to detect illicit copies of software but that do not take charge of the management of plagiarism conflicts between software publishers.

4.3.2 The Nature of Intangible Assets

Whatever the type of IPR infringement, two essential features of the protected material influence the ability of the owners of intangible goods to collectivize the management of their rights: the ambiguity with which their rights are defined (4.3.2.1), and the public displaying of the uses of the protected material (4.3.2.2). Whereas the first feature corresponds to the ease for competitors to invent around or the capacity with which misappropriation of IPR can be specified, the second feature is linked to the ease with which misappropriation of IPR can be detected.

4.3.2.1 The ambiguity of Measures

As pointed out above, the (uses, exclusion, remuneration, etc.) rights granted by public institutions to an author or an inventor can be either precise or quite vague. If one compares patents to Copyrights, the former provides the patentee with exclusive rights that are more difficult to interpret than the latter. Indeed, there are many gaps between actual technical realizations and the wording of the patent because of the incomplete description of the invention, and because of the “equivalent doctrine”. It is therefore difficult to decipher an actual technical realization sufficiently to reveal and evaluate overlapping between it and the title deed. Moreover, it is quite impossible to forecast such overlapping before the achievement of the technical realization both because any development process is uncertain and because the scope of a patent is partially *ex-post* clarified by the Courts (when prosecutions occur). On the other hand, in the case of Copyrights it is the codification of an expression that is protected. The title deed is therefore composed of the protected work itself. Moreover, the Law states precisely how the
Codification has to be performed to delineate IPR. It also anticipates, in the case of collective production, what the rights of the diverse participants in the production process are (e.g. composers, lyricists, arrangers, singers, musicians, etc., in the case of recorded music). As pointed out above, Copyrights can therefore be considered as less ambiguously delimited (measured) by public institutions.

As a result, it is easier to create Private Bodies to manage the latter category of property rights than the former. Indeed, when delineation is clear, any third party, including the one to whom their governance is delegated, can more easily identify protected works. Moreover, it is easier to specify and to detect the uses of a protected material (because interpretation margins are small) and to track their actual uses. Lastly, clear delineation facilitates the design of standardized and codified methods of identification of works — word sequences for written materials, note sequences for music, etc. This facilitates the comparison between the copy of the displayed material and the original and does not call for value judgments to certify similarities. The decoding of a realization (performance) can also be performed by less specialized individuals than in the case of patents. For instance, in France, SACEM’s inspectors are not specialized in any kind of music. They visit any type of public place where music is played, and record, thanks to special codification methods, the main characteristics of the pieces played. This enables the organization to check if the fees have been paid and to detect infringements.

4.3.2.2 Public Display

The ability to collectivize the combat against IPR infringement also depends upon the public character of the use of the protected material. Indeed, when by nature the use of the intangible resources cannot be kept secret, actual uses of it are easier to observe. Supervision efforts are potentially more fruitful. IPRs owners are therefore incited to collectivize these efforts, essentially to benefit from economies of scope. On the contrary, when potential infringements are not made public, supervision is less profitable.

This is basically why there is at first sight a difference between the Copyrights regime and that of patents. Works of authorship are, to a large extent, products or components of products that will be transmitted to some third party either because they will be transferred for private use or because they are publicly performed or broadcasted. Technological ideas can, however, be incorporated into equipments that are privately used. It is therefore much more complex to organize a collective verification system of patent infringements than to design a mechanism to supervise copyright uses.

This statement, however, needs qualifying. Indeed, technological ideas are often incorporated into products sold to the public. In that case, it is possible to collectivize the means of performing a costless systematic supervision system. This is, for instance, the case in the pharmaceutical industry, where specialized consultant firms produce very precise and accurate data on the actual sales of the different patented molecules. This enables patentees to benefit from precise information about the actual uses of their patents by licensees.
In the same spirit, collective institutions cannot easily combat some types of copyright infringement because they are fundamentally private. The private copying of records, for instance, is quite impossible to actually forbid. On-line exchanges of music pieces is easier to forbid, especially if the defenders can implement technologies that enable them to analyze the details of exchanges among members of P2P communities, or even to analyze the content of hard disks on computers in networks. Obviously, privacy legislation and technologies enable users to fake their private exchanges. It is thus the public display and more generally the visibility of uses, and not the legal nature of the rights, that influences the ability to collectivize or collectivize their enforcement.

4.3.3 Owners’ Influence: The Diverse Diffusion Policies

The ability to collectivize supervision is also strongly dependent upon the diffusion policies of owners of intangible goods. They can either favour the widest possible spread and use of their intellectual production in order to be remunerated by high royalty fees, or prefer to forbid any use in order to benefit from their exclusive rights of use. An intermediate policy consists of discriminating among the various potential users by providing authorization to exploit only to specific categories of complementary users.

The first policy is dominant in the case of works of authorship because these works are consumer products rather than production means. The consumption of a work by a final user or by an intermediary that performs or broadcasts it does not reduce the potential revenues of the author or of the copyright owners. On the contrary, it can increase its reputation and therefore the propensity of the public to consume its production. A patentee can also follow this type of policy. Indeed, in some industries technological interdependencies are so high that patentees are either incited or obliged to license their patents to any demander. Technological spillovers, or increasing returns of adoption, or regulation and standardization constraints can indeed lead all the players in an industry to use the same technology. The resulting widespread policy leads to the adoption of a regime of general authorization of duplication and uses in exchange for royalty fee collection, and favours recourse to collective governance.

On the other hand, when it is a question of forbidding uses, the implementation of a collective mechanism is much more difficult. Two reasons explain this. First, most of the time the prohibition is not absolute. Many situations in which some types of uses are authorized exist. For instance, a patentee whose policy is to directly exploit its patented inventions can nevertheless grant licenses (at least restrictive ones) to partners that control assets being essential to exploit the patent on a specific national or niche market, or to developers that can invent around the initial technology. In such cases, a central supervision body would be obliged to deal with a tremendous number of dispensations to a general principle of forbidden use, which would be quite impossible to manage. The second reason why collective mechanisms are less efficient in case of discriminatory and use-forbidding policy is linked to the difficulty of enforcing the prohibition of uses. In the last resort, banning can only depend upon public authorities that are the sole agent granted with the ability to use violence to enforce a decision. As a result, actual exclusion can occur only if IPR infringement is verifiable and duly certified by a Court. Moreover, the Court
has to estimate that an actual exclusion is legitimate because damages would not suffice to atone for actual losses. Given the long delays and the high cost of lawsuits (Cf. Williamson 1985) especially in the case of patents (Lanjouw 1998, Lanjouw and Shanckerman 2001), the difficulty in actually enforcing exclusion rights often leads owners of intangible goods (especially patentees) to negotiate with infringers\(^2\). The actual management of exclusion rights requiring a high level of customization, it is difficult to collectivize.

### 4.3.4 The Public vs. Private Governance of IPRs Trade-off

Owners of intangible goods face a trade-off when they have to decide how to organize the defence of their property rights. On the one hand, there are economies in collectivizing it, which call for the settlement of private institutions, and even to the performance by public institutions of certain tasks. On the other hand, the collective defence of IPRs generates inefficiencies, especially when infringements consist of plagiarism rather than servile copy; when formal institutions ambiguously delineate IPRs; when the uses of intangible resources can be kept private; or when owners of intangible goods seek to discriminate the users of their creations. Table 1 sums up these diverse elements according to the different types of operations required in managing IPR systems, given the various possible governance needs.

In the matter of measurement there are strong advantages in relying on public and general institutions, both because there are strong economies of “collectivization” and because general and unspecialized solutions do not generate too high costs of mal-adaptation.

- Property right delineation is likely to be taken charge of by Public Institutions both because public authorities are really able to implement mandatory registering and because they address wide communities; making then sure that the delineation of exclusive rights of use is really public and clear, for most of the potential stakeholders (other owners of intangible goods, potential users, future creators, etc.) are able to cover wide communities and because they benefit from a power of last resort. Public institutions can, however, as shown in section 5, rely on private efforts and expertise to decrease the cost of PR delineation.

- The identification of owners should also be centralized to benefit from a more efficient IPR system (see section 3). Moreover, it should be performed by public institutions to enable intangible resource users to identify owners easily.

In matter of enforcement, collectivization is also useful. The ability to collectivize is however strongly dependent upon the owners’ policy:

\(^2\) The latter are also interested in negotiating out of court settlements. Indeed, the cost of a prohibition of uses can be extremely high because the infringer can be forced to discard industrial and commercial investments and pay damages to its own clients (who can be involuntary infringers or who would no longer access to specific inputs provided by the infringer). Following a paretoian logic, patentees and infringers often negotiate bilateral agreements that enable them to reduce the potential costs of actually enforcing prohibition of uses. This is documented, for instance, in the case of the semi-conductor industry by Hall and Zeidonis (2001).
• “Usus”
  
  o There are many obstacles to the collectivization of illegal use detection. Collectivization is feasible for private copies, when IPR delineation is clear, when there is public display or when diffusion policies are performed.
  
  o To maintain civil peace, public institutions have to maintain the monopoly of legitimate violence. As a result, last resort exclusion operations have to be performed by public institutions.
  
• “Abusus”: the ability to collectivize the management of the granting of uses authorization greatly depends upon the chosen diffusion policy.
  
• “Fructus”:
  
  o The control of the actual (intensity of) uses of the resources is likely to be centralized because there are economies of scale, scope and learning, if the type of use of the diverse works of mind is at least partially standardized and made public.
  
  o Money collecting operations can be a source of major economies of scale and scope if the users are numerous and using a wide range of protected intangible resources because centralization will enable the limitation of the number of bilateral transfers and associated transaction costs (negotiation, payment securization, etc.).

<table>
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<tr>
<th>Table 1: IPRs Governance Tasks and the Division of Labour among Governance Devices</th>
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<tr>
<td><strong>Measure:</strong> IPRs' Scope Delineation</td>
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<tr>
<td>Owners identification</td>
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<tr>
<td><strong>Enforcement</strong></td>
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<tr>
<td><strong>Usus: Exclusion enforcement</strong></td>
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<tr>
<td>Illegal uses detection</td>
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<td>Exclusion</td>
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<td><strong>Abusus: Waivement enforcement</strong></td>
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<tr>
<td>Authorization management</td>
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<tr>
<td><strong>Fructus: Revenue collection enforcement</strong></td>
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<tr>
<td>Control of actual uses of authorized uses</td>
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<td>Money collecting</td>
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SC: Servile Copies  
CD: Clear Delineation or IPRs  
PD: Public Displaying  
DP: Diffusion Policies  
PP: Prohibition and discrimination Policies  
PI: Plagiarism  
AD: Ambiguous Delineation  
SU: Kept Secret Uses

The table indicates, for instance, that the detection of illegal uses is efficiently performed by public institutions in case of service copies (SC in the “Public institution” column on the “Illegal use detection” line.

5. Specialized and Generic Institutions
When it focuses on the performing of some specific task in a specific field, an institution benefits from economies of learning. Moreover, while they are collective, institutions generate less maladaptation costs when they are focussed since the specificities of the domain can be taken into account. On the other hand, more general and less specialized institutions benefit from potentially larger economies of scale and scope.

A good example of the positive effects of specialization is given by SACEM. This French collective governance structure has developed specialized investigation methods that are tailored to the specificities of works of authorship in music. It has also developed specific codification methods and databases to keep track of protected pieces. SACEM’s investigators systematically track the uses of the various music pieces and the organization systematizes the collection of royalty fees from every kind of user. It's focus on music enables the organization to be aware of what is happening in every aspect of the music world. This maximizes its ability to gather royalties, and also to finely tune the rate of royalties to the actual users' willingness to pay (which depends both on the added value of music and its profitability). SACEM’s specialization also enables it to share the collected funds efficiently among its members.

While there are exceptions to the principle, the more focused the institution (on a specific field and a specific task), the more likely it is to manage IPR governance efficiently. Since private institutions are constitutionally built to exercise a specific set of tasks in a specific field, they tend to be more specialized than public institutions, which are designed to deal with general situations. For example, the judicial system was created to solve all kind of problems. As argued by Williamson (1985), this leads Courts to be relatively inefficient conflict resolution mechanisms when they deal with complex and idiosyncratic cases.

However, this general principle can be countered by pro-active specialization policies. Indeed, public institutions involved in the governance of property rights are sometimes tailored to specific tasks or to specific fields. This is, for instance, typically the case of Patent Offices that are public, but that are specialized in the task of measuring property rights. Although they are not specialized in every sub-field of each technique, they employ engineers that are used to dealing with the legal-economic-technical issues, which enable them to exercise some control over claims and to arbitrate debates among claimants and their potential competitors. This leads to more efficient control than that which is performed over copyrighted material. Another example is given by the comparison between the US and French courts in charge of patent infringements. In France, courts that are not entirely dedicated to IPRs related problems litigate suits. Judges manage a small number of such cases in their careers. They are often reproached with judging technico-economical conflicts according to a purely legal logic that lead to inefficiencies. This is not the case in the US where the Federal court created a specialized court in 1982. Intellectual property specialists consider that this specialized court considerably reinforces the strength of IPRs because they can efficiently manage complex technological cases.

Focusing an institution on the performing of a specific set of tasks in a specific field is a good way to generate learning effects. But other factors come into play. In particular the way the
organization relies on individual players’ expertise matters, since the latter knows the details of the technological and economic problems they have to deal with.

- Such a use of expertise can be performed, first, by implementing litigation processes based on a contradictory debate between economic agents — i.e. an accusatory process arbitrated by a judge between a prosecutor and a defendant — rather than processes based on investigations performed by the judge or a police system — i.e. an inquisitory process where the judicial system manages investigations itself. This is fundamentally the difference between US courts and French ones and which prevents the latter from dealing efficiently with highly complex technical cases, whether they are related to technology or not, information asymmetries and costs of access to the relevant knowledge are always higher for a third party than for the parties.

- It can also be performed by linking the institution to the informal conventions and informal information networks that often structure communities. Both the US Patent Office’s examiner and US specialized judges maintain close relationships with the professional milieu they are in charge of. They can be members of expert societies, attend conferences, consult experts, etc. All these means are used to learn the informal interpretation rules, fair practices rules, technical knowledge, etc. that are specific to any scientific and industrial field (e.g. Nelson 1993). This enables them to take more accurate decisions than French examiners and judges who are more cut off from the industrial milieu (Bessy and Brousseau 1997). Cooper (1993) explains these strong interactions between experts and judges in the US by the fact that, at its origins, the US patent system was partially managed by industrial unions.

These elements explain why the US patent system seems to guarantee IPRs better than the French one, even if in both systems a wide degree of measurement and enforcement operations have to be performed by owners of intangible goods.

6. Concluding remarks

By referring to the organization of governance of patents and copyrights both in the US and in France, Table 2 points out the entity that is responsible for the various tasks involved in the settlement of intellectual property rights.

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22 Obviously experts can help judges, but in that case it is the expert who makes the judge’s decision. This is because he is supposed to state the “truth” and because its opinion is not submitted to contradiction (since he is not supposed to defend any parties’ interests).

23 There are however weaknesses in the US system, especially when it addresses new technological domains. As pointed out by Lerner (2002), the insufficient knowledge of “prior art” by the PTO examiner explains why standards of patentability have been excessively low in new technological domains such as software, biotechnologies, and business methods. As it happened in the chemical industry by the end of the XIXth century, institutions need time to learn (Cf. Arora and Fosfuri 2002).
Table 2: The Governance of Patents and Copyrights in France and in the US

<table>
<thead>
<tr>
<th>Operations</th>
<th>Patents</th>
<th>Copyrights/DAs</th>
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<tbody>
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<td></td>
<td>US</td>
<td>France</td>
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<tr>
<td>Measure:</td>
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<tr>
<td>IPRs’ Scope Delineation</td>
<td>Spec Pub Inst</td>
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<tr>
<td>Owners of intangibles’ identification</td>
<td>Spec Pub Inst</td>
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<td>Enforcement</td>
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<tr>
<td>Usus: Exclusion enforcement</td>
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<tr>
<td>Illegal uses detection</td>
<td>Owners</td>
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<td>Exclusion</td>
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<td>Abusus: Waivement enforcement</td>
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<td>Authorization management</td>
<td>Owners</td>
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<td>Fructus: Revenues collection</td>
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<td>enforcement</td>
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<td>Control of actual uses of authorized uses</td>
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<td>Money gathering</td>
<td>Owners</td>
<td>Priv Inst</td>
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There are two major differences between the patent and Copyright systems. First, public institutions are more involved in the measurement of IPRs in the former case than in the latter. This is largely due to the potentially high negative externalities of a bad governance of property rights on technological inventions. Second, the enforcement of IPRs and management of their valorisation is more collectivized in the Copyright system than in the patent one. The former system is well suited to combating servile copies and the management of large-scale diffusion policies, while the latter is more efficient against plagiarism and when customized diffusion policies are carried out. One can, however, point out that, to an extent, this situation could evolve. Indeed, in industries where many standardized technological license agreements are set up because innovators have diffusion policies (Bessy and Brousseau 1998), the implementation of private collective governance means would be efficient to supervise uses and collect fees. Institutions comparable to SACEM could emerge. This is probably a major issue in the software industry, especially with the development of digital networks. This highlights the fact, at least, that the debate around the protection of software by patents rather than by copyrights misses two important points: the type of diffusion policy chosen by owners of intangible goods; and the efficiency of the institutional framework to actually enforce IPRs. If such collective private institutions existed, producers of works of mind would be less reluctant to widely authorize their use because they will benefit from higher revenues at not significantly higher costs. Favouring the emergence of such institutions in the software or pharmaceutical industries would therefore probably favour a wider diffusion of patented material.

There are obviously other arguments to consider. Indeed, software developers can be interested by benefits other than financial returns. In particular, they can seek to benefit from spillovers provided by the other developers. In this case, open source licenses are an efficient way to organize the diffusion of source code (see the arguments developed by Bessen and Maskin (2000) and Saint Paul (2003)). At the same time, as pointed out in Bessy and Brousseau (1998), private
institutions can be useful to facilitate the transmission and the sharing of knowledge among partners involved in the development of a common technology. Put another way, private institutions are not only used to support and facilitate commercial transaction — e.g. by taking in charge the management of payments — they are also useful to coordinate economic agents. This is exactly the role played by communities in the Open Source Software. Communities establish and enforce rules to ensure an efficient management of knowledge; efficient being interpreted in various ways across different communities. The same might happen within patent pools (see Merges, 1996, 2001, and Shapiro, 2000).

When one compares the US and the French patent systems, one can point out that the main difference is the greater specialization of US institutions. This greater specialization is largely due to the dedication of some courts to patent infringement cases and to the intensive relationship between patent office examiners and judges with the professional and technical communities. Since the French and US patent laws are very similar, this huge governance difference is probably one of the major reasons why technological IPRs are stronger in the US than in France. The comparison between the US and the French concerning works of authorship indicates two things. First, since public institutions do not participate in the measurement operations, especially because there is no Droits d'Auteur registration system, there is a source of inefficiency because involuntary Droit d'Auteur infringement is more likely to occur. Second, the US system enables a greater flexibility in finely tailoring the governance structure according to authors’ preferences and to the specific economics of each type of work of authorship. Put another way, the US public institutional framework allows a greater flexibility in the way individual owners can manage their rights. It is partly linked to the fact that public institutions try to provide an efficient infrastructure to measure IPRs ex-ante and solve conflicts ex-post; while in France Public Institutions do not provide such an efficient infrastructure to IPR owners, leading them either to trade less on technology or to collectivize (and thus mitigate) the management of their property title deeds.

This paper therefore illustrates the potentiality of New-Institutional Economics to provide useful insights in economic policy. It especially enables us to point out the important complementarities between public and private institutions. It also shows how the devices that govern laws are essential to their actual implementation because they affect their actual properties. This suggests that research in IP economics but also in Law and economics in general, especially when it has to deal with competition policies, should take into account the implementation problems more carefully. This would lead to recommendations being made about the organization of public institutions as well as about the support to private ones.
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