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Academic response to the European Commission's Questionnaire on the patent system in Europe: An economic approach

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Abstract

This paper presents an economic opinion on the questionnaire on the European patent system that was recently issued by the European Commission. We argue that the debate on patent reform in Europe needs to be more focused on its economic purpose, namely the promotion of innovation. As a first step we unfold sub-issues and trade-offs underlying the general and consensual goal which “promoting innovation” is. We contrast the protection and diffusion functions of the patent system, both of which must be taken into account in order to create an original European patent regime geared towards innovation. We also emphasize the possibility for the European patent system to answer more specific needs, such as those of small and medium enterprises or those of industries with highly cumulative innovations. We discuss as the second step the capacity of the European patent system to achieve these policy goals through various levers. We especially argue that patent fees or translation requirements should be viewed as policy instruments rather than as in a purely budgetary perspective. We moreover consider the positive or negative consequences one can expect from the coexistence of different patent systems in Europe.

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1. Introduction

Over the past 25 years, economic literature on intellectual property rights has impressively grown [12,20]. Both its empirical and normative findings have pinpointed the needs for a reform in patent law and its enforcement. We therefore thought as useful to bring a contribution as economists to the questionnaire of the European Commission on the patent system in Europe [4]. Our opinion focuses on the principles underlying the patent system and on the Community patent (i.e., Sections 1 and 2 of the questionnaire).

In our eyes, the description in the questionnaire of the basic principles underlying the European patent system lays too much emphasis on general social aspects, while the description of economic principles is too narrow.

Although patent law intersects with other public policy interests than promoting innovation, the balance between this primary objective and other legitimate public interests should not be set within patent law. Economic growth benefits from innovation. Quality of life may benefit from innovation too. However, promoting economic growth and quality of life is beyond the relevant scope of the patent system's principles, which should be geared towards innovation only.

Our response to the questionnaire thus aims at reformulating the question of the basic principles underlying a *patent regime* geared towards innovation only, and at identifying and discussing policy levers to implement these principles.

The paper is structured in four parts. The first part formulates the problem of choosing a patent regime as a trade-off between exclusion and diffusion. The second part emphasizes specific needs (e.g., those of small firms or high tech industries) that the patent system may address, and the extent to which these needs must be taken into account

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when undertaking reforms. The third part deals with the financing of patent offices and the setting of filing and renewal fees. We argue especially that severing the fees charged to patent filers from the financial needs of the offices can suppress bad incentives and provide powerful policy levers. The fourth part discusses the rationale for a multi-tier system and the mechanisms of competition between national and community titles.

2. Which patent regime for the European Union?

From an economic point of view, promoting innovation should be the single goal of the patent system. However, different patent regimes can achieve this goal. A patent regime indeed sets a particular balance between exclusion and diffusion, two factors that support innovation [16].

The first and most obvious way in which the patent system promotes innovation consists in providing innovators with a temporary exclusive right that enables them to make profits. In economics terms, innovations are indeed information goods that can be imitated easily by competitors. In absence of legal protection conferred by patents, such imitations would prevent innovators from making any profit from their inventions. Therefore potential innovators would be dissuaded from investing in R&D. By contrast patents provide innovators with a temporary monopoly position that creates incentives for them to invest in R&D. In pharmaceuticals and chemicals, legal exclusivity is actually the most reliable way to protect intellectual assets where development is extremely costly. In other sectors, patents are used to protect innovations in combination with other protection means such as the first mover's time advance over imitators and secrecy [2,17].

Why then limit the exclusivity conferred by patents? A longer or broader patent reinforces patent protection, and therefore generates more incentives to innovate. As a matter of fact, an OECD [15] survey reports that, during recent decades, firms in all sectors have reacted to the strengthening of patent law by increasing their research investments. This incentive function however has a counterpart, namely the deadweight loss associated with a uniform monopoly pricing. Patent law thus ensures a trade-off between dynamic efficiency (the promotion of innovation) and static inefficiency (the temporary monopoly). Rules such as the delineation of the claims and the legal patent duration materialize this balance between the respective interests of innovators and consumers.

Besides providing incentives to innovate, the patent system promotes innovation by assuring a better diffusion of knowledge and information, through patent disclosure and licensing. Disclosure is a means for firms to be informed about the state of the art, which may help them to innovate, and to avoid investing in technologies that are already patented. A key function of the patent system

is thus to make such information easily accessible to third parties. The combination of disclosure and legal exclusivity also provides a basis for a market for technologies. The definition of property rights enables technology transfers through licensing contracts whereas the disclosure of patents informs potential buyers about the availability of innovations that can be licensed. Interestingly, licensing reconciles static efficiency and dynamic efficiency, innovation and diffusion. It can for instance facilitate the exploitation of a technology at a larger scale, or at a lesser cost, than if it were entirely done by the patentee. In any case the static efficiency is improved. As the corresponding incremental profit is shared between the licensee and licensor, it furthermore increases the licensor's incentives to innovate.

Recent studies show both the importance of the market for technologies and the relative weakness of the European patent system in this respect. European companies are far behind American and Japanese ones if we compare the weight of both royalty payments and royalty revenues with their total R&D budget [6]. The OECD survey [15] quoted above, furthermore shows that 60% of companies anticipate that licensing contracts will increase over the next decade. It is all the more important that the European patent system favours a better functioning of markets for R&D. This can be done through rules concerning the timing of disclosure, the quality of the innovation description in patents, and an efficient management of patent databases. As uncertain patent scope and validity are strong impediments for the signing of licensing contracts, preserving a high quality of patent examinations is also a critical factor.

The importance of markets for technologies also varies between sectors. The OECD survey [12] reveals for instance that markets for technologies are much more developed in high technology sectors such as information and telecommunication technologies or biotechnology. The relative lag of Europe in high-tech industries may then explain why, on average, European firms are less involved in licensing than their American and Japanese counterparts. It seems thus socially worthwhile that the European patent system be geared in priority towards creating the conditions for an efficient market for high-tech.

A good illustration that a patent system can promote innovation in different ways is given by the American and Japanese patent regimes [16]. The American system is principally dedicated to providing a strong protection to innovators. Indeed broad patents can be obtained easily, the first to invent rule prevails upon the first to file one, and disclosure requirements are not constraining. By contrast, the Japanese system lays the emphasis on disclosure and the creation of markets for technologies. Patent protection is weaker, and patenting procedures such as the first to file rule are meant to reduce the delay and improve the quality of innovation disclosure.

What patent regime should prevail in the European union? We regret the questionnaire does not address this

question. It is very unfortunate because the “effectiveness” of a patent regime has to be assessed with respect to its specific balance. Talking about an effective European patent system requires knowing as a first step what is the corresponding patent regime.

3. One system and different needs

Patent regimes can be fine-tuned in addressing specific needs. In the European case, promoting innovation requires especially paying a specific attention to small and medium size enterprises (hereafter, SMEs) and to cumulative inventions. Only the former need is mentioned in the questionnaire. In our opinion, however, addressing the second one is at least as important.

SMEs have specific needs for patents and a relative weakness vis-à-vis large firms, which may justify measures to facilitate their access to the patent system. Patents are indeed key assets for SMEs, especially startups. As their business is generally focused on one activity, the protection of a competitive advantage based on technology may be crucial for their survival. When they are high-tech SMEs or startups, patents can furthermore play an important role in their relationships with economic partners. Patents allow the marketing of innovative technologies through licensing contracts. They also are magnets to attract venture capitalists, since they signal both the value of a technology and the fact that it is secure.

Despite these specific needs for patents, SMEs tend to file less patents than large companies. In fact, large companies are in a better position to benefit from the patent system. Their wider patent portfolios are partly inherited from their past activity, but also reflect their better capacity to file patents and value them vis-à-vis other firms. Large companies can hire their own patent management teams, and thereby benefit from economies of scale that reduce the average cost per patent. Moreover, their repeated interactions with other companies in patent litigations enable them to build a reputation of tough litigator, and to have more bargaining power to negotiate licensing agreements [11]. These biases explain why large European firms own more unused patents than small ones. Small firms and startups do not benefit from the same economies of scale. They use patents more selectively, to protect their most valuable intellectual assets, and therefore hold smaller patent portfolios.

In this context, it can make sense to facilitate the access of SMEs to the patent system. The asymmetry between SMEs and large firms can be detrimental to the former. While large firms are on an even basis to negotiate licensing or cross-licensing agreements with each other, they are indeed in a favourable position vis-à-vis smaller firms that cannot leverage a large patent portfolio and a tough litigator reputation. As a result small firms can be deterred from entry in some sectors or markets [9], or have to sign unbalanced licensing agreements. In this context, solutions such as preferential filing fees (see

infra) can partly compensate the disadvantages of being a small firm.

In our view, cumulative inventions (i.e., inventions that are built upon each other) are also a specific need to address. In sectors where innovations are highly cumulative (such as biotechnology or information technology), the impact of the patent system on innovation can be ambiguous [18]. On the one hand, the granting, disclosure and licensing of patents are useful to avoid the duplication of R&D costs and organise the collective R&D effort in an efficient way. On the other hand, upstream patents may also be impediments for downstream innovations. Subsequent innovators can be held up unexpectedly, which deters R&D investments. More generally, the multiplication of patent claimants on one particular innovation generates additional transaction costs [10].

The hold-up problem can be solved by ensuring that licensing contracts or R&D joint venture agreements can be dealt with before the downstream innovator invests in R&D [8]. This requires that potential innovators can identify patent holders sufficiently early, and that all parties have a common evaluation of the costs and benefits of the projects. Therefore, patent claims must be reasonable and clearly defined, and information on prior art patents must be complete and easily accessible. The same measures more generally permit to reduce the multiplication of potential patent claimants and the corresponding transaction costs.

Cumulative innovation is more frequent in high technology sectors. Ensuring an efficient collective innovation effort then requires preventing the creation of a patent thicket, that is, an excessive fragmentation of patents in a given technology field [21]. This necessitates taking into account how patents facilitate the collective organisation of innovation in different sectors – from the licensing of research tools in biotechnology to the negotiation of cooperative industry standards in information and communications technologies – in order to preserve and promote the best practices. In contrast the patent system should prevent the proliferation of weak or useless patents that do not protect real inventions and may deter downstream innovation.

4. Fees as a lever to improve efficiency

Patent fees play a major role in patent systems. They are the main financial resource of Patent Offices. Therefore, they cap the level of efforts that can be devoted to patent examination. They are also a part of the cost incurred by patent filers. On the margin, their reduction can thus attract new patent applications whereas their increase may deter applications for low value patents. Knowing the importance of those effects, we regret the lack of details on the future fee system for the Community patent. Paradoxically, the Council Proposal for a Community patent [3] is more precise on the allocation of the collected fees than on their level, structure (research, determination,

renewal fees) or differentiation with respect to categories of applicants (e.g., Universities, SMEs).¹ In our opinion, this reveals a purely budgetary approach of fees, when an economic approach would be more relevant.

Commonly, patent fees are viewed as a budgetary instrument rather than an economic instrument. There is however a strong case against this view, since using fees as a budgetary resource results in a series of wrong incentives [13,7]. Indeed the Patent Office tends to wrongly consider applicants as its clients and fees as the prices charged to them for services. This firstly creates a bias in favour of applicants and patent owners, which may be socially harmful when their particular interests are not in line with promoting innovation. A patent rejection means for instance a loss of revenue (the future renewal fees) for the Patent Office, even though this rejection would be desirable from a social viewpoint. Secondly, considering fees as market prices does not necessarily create incentives for the Patent Office to improve its performances. The Patent Office enjoys a monopoly position, and economists know that monopolies favour quiet life rather than efforts. Therefore the Patent Office has only weak incentives to reduce its costs and improve its quality standard of examination.² Finally, using the fees to finance the Patent Office also makes it more difficult to change the fee scheme. For instance, reducing fees to make patents more affordable to SMEs would require an increase in fees for other applicants for compensation.

In contrast, the use of patent fees as a flexible economic instrument could improve the efficiency and cost-effectiveness of the patent system. The fees can indeed be used to discriminate between the users of the patent system and to regulate their behaviours.

Discrimination based on fees can target some categories of firms or some particular innovations. A discriminatory reduction of filing and renewal fees could for instance aim to make patents more affordable to certain categories of applicants such as SMEs or Universities, for which access to the patent system can be more costly than for large companies. This solution has been adopted in the United States in the case of SMEs [15]. It has the merit to provide extra incentives for SMEs to patent their innovations without increasing incentives for other applicants to file more patents. In contrast to a uniform reduction scheme, it would thus keep the boom in new applications,

¹ The Council Proposal states that “fifty per cent of the income from renewal fees shall be distributed among the central industrial property offices of the Member States” (Art. 60.1a) and that. “The renewal fee for a Community Patent must not exceed the level of the corresponding renewal fees for an average European Patent and will be progressive throughout the life of the Community Patent. [...] The level of fees will be related to costs for handling the Community Patent [...]”. Preamble (5a).

² The granting of weak patents increases the pressure on Courts and transfers extra costs to the judicial level of the patent system. Moreover, Courts cannot entirely compensate a failure of the Patent Office. Indeed most legal disputes are settled before the Court makes a decision, which favours the persistence of weak patents [22].

and therefore the increase in the number of low value patents, at a reasonable level. Discriminatory fees could also be applied to different innovations. Since Nordhaus [14], it is well known that a uniform duration of patent life is sub-optimal. Patent life should vary in function of the specific cost and value of innovations within and across industries. As renewal fees influence the actual duration of patents, they can facilitate such a fine tuning. It is therefore critical for the Community Patent’s performance to precisely define how and why renewable fees will vary through time.³ Economic studies actually show that the progressive fees proposed by the Council are not the best system [19,1]. A more efficient system could for instance consist of high renewal fees on the front-end to deter worthless patents, followed by low renewal fees to facilitate the renewal of valuable innovations, and increasing renewal fees toward the end to encourage the diffusion of innovation [1].

Patent fees can also be used to fine-tune the behaviours of patent filers. In the American and European patent systems, additional fees are charged to patent filers when their patent exceeds a certain number of patent claims [15]. This discourages the filing of patents with a high number of claims which are more costly to examine and may be of low informational value.⁴ Another way to regulate filing behaviours could for instance consist in introducing asymmetric filing fees. The total private cost of patenting (i.e., in-house costs + agents’ remuneration + filing and renewal fees) is a disincentive to file low quality patents (e.g., patents which validity or claims are likely to be rejected by the Office or by a Court) since the corresponding expenditures are lost in case of rejection. Yet this cost is also incurred by filers of high quality patents. The disincentives could thus be preserved in asking applicants to make an advance payment which will be reimbursed only if the patent is granted. Such asymmetric fees increase dissuasion to file poor quality patents without penalising fair-play applicants.

To sum up, in a one-size fits all system, modulating fees helps in achieving specific goals and increases economic efficiency.

5. Institutional design of multi-tier systems

The European patent system is currently featured with the co-existence of national and European patenting circuits. Adding a Community patent could reduce translation requirements and therefore administration costs for patent filers. But it may also increase complexity and therefore administrative costs for the same patent filers. Moreover, it introduces a competition between national and federal titles which outcome is uncertain.

³ The Council Proposal states only that “renewable fees [...] will be progressive throughout the life of the Community Patent”.

⁴ Multiplying patent claims can be a way to dissimulate what is the true innovation.

The economics of translation is very simple: translation enhances social welfare in so far as it increases diffusion of strategic and technical information. The normative motto is “We shall translate when translation cost is lower than the benefit provided by the extra diffusion of information the translation permits”. Therefore, all patents should not be translated once granted. In fact, numerous patents have zero or low informational value, and renewal fees will not be paid by their owner. Moreover, the benefits of a patent’s translation depend on languages. The higher the number of scientists, competitors, lawyers, etc. who speak language A and are not fluent in language B, the higher the benefits of translating a patent from B into A.

As a result, flexibility and subsidiarity in language translation should prevail on a uniform treatment. It may in particular be preferable not to translate patents too early and at the same time. One could for instance envisage a mandatory translation into n languages (say, 0, 1 or 2) when the patent is granted, and additional translations later (say, $n + 1$ languages at year 2, $n + 2$ languages at year 4). Such a mechanism would reduce the risk a patent be translated with no benefit for society, since translations would be limited to more valuable patents. Moreover, as local institutions are better informed about the benefits of local diffusion of information through translation, economics recommends the decentralisation of the decision and of the translation costs. One may envisage, for instance, that national Ministries for Research and Technology, or even national Patent Offices, decide and subsidize patents’ translations.

Although current data on the benefits of translation are very poor, we do know that a uniform requirement of translation, even limited to claims, in all Community languages would be inefficient (i.e., lower diffusion benefits than translation costs). In most countries scientists and engineers are able to communicate in another language than their mother tongue,⁵ and they usually speak English when they meet at the international level. In contrast, the cost of translation in every national language is huge, and actually explains for a large part the higher costs of European patents relatively to Japanese and American patents [15]. Indeed translators are all the more scarce and expensive as they must also have engineering skills. Most commentators therefore recommend reducing translation requirements in order to make the European patent more affordable for innovators. In an economic perspective, the same recommendation derives from another reason. Translation requirements must be reduced because they corre-

spond to a waste of resource: their benefit for society does not balance their cost, whoever incurs it. As a consequence they should be reduced even if the cost reduction were not passed on to patent applicants. This point is noteworthy because a more affordable patent for all is not always a good patent policy. As mentioned before, it increases the number of low value patents and the costs associated with patent fragmentation.

Beyond the problem of translations is that of the articulation between the national, European and Community patent systems. Ideally, the creation of a third patent circuit in Europe will entail zero costs. Applicants will benefit from a larger choice. And the competition between the European and Community patents at the EU level will result either in the selection of the best one if they happen to be redundant, or in their coexistence otherwise. However, this scenario may be optimistic. Let us see what we can expect from the competition of the three systems.

National titles delivered by national offices have an economic justification, since some inventions have only a local market application. For instance, an improvement of the process to cook French baguettes may not be worth to be patented in Ireland or Greece. A federal title delivered by a federal Patent Office has an economic justification, too. Because of globalisation, a growing number of inventions concern regional and world markets. The economic rationale for a system complementing a federal one and a national one throughout a bunch of national titles granted by a federal office is more dubious. The problem is all the more complicated as the same Patent Office, namely the EPO, is supposed to examine both European and Community patent filings.

From an economic point of view, the larger the geographic extension is, the higher the quality standard should be. The reason lies in different impacts of errors. Mistakes consisting in wrongly granting a patent or wrongly rejecting a patent are more costly for society when the application deals with a large economic area than with a small one. As a consequence, efforts dedicated to examination should be higher when a patent covers 25 countries than a few ones. To put it another way, a long-term co-existence of European and Community patents may only be economically rational if the examination is different (i.e., stricter for the Community patent). Yet it is difficult (not to say impossible) envisaging EPO will apply a different quality standard of examination depending on whether the applicant applies for a European or a for a Community patent. Because it will not be the case, a two-tier system is likely to be better than a three-tier system.

Assuming that the Community patent enters into force in addition to the European patent, can we expect the competition process will select the best one? First of all, it is important to notice that competition will not be based on quality and cost of the examination for EPO is likely to apply the same standard for a bunch of 2 national patents or for the Community patent covering 25 countries. There-

⁵ According to the European Commission [5], 56% of Europeans are able to hold a conversation in a language other than their mother tongue and 28% in two other languages than their mother tongue. These figures are higher for scientists because they are younger and more educated than the average EU citizen. The most used language in the EU are English and then German and French. These three languages are merely the official EPO languages and European patent claims are available in these three languages.

fore, competition will be mainly based on price.⁶ Here again, the setting of fees will be determinant. The Proposal caps the renewal fee for a Community patent at the level of corresponding fees for an average European patent. Such a cap provides the Community patent with a safe-harbour vis-à-vis the European patent. Everything else being equal, applicants seeking a large European scope for the protection of their invention will choose the Community patent. This strategic use of fees is very regrettable from an economic point of view. Neither efficiency nor cost considerations have been taken into account in the setting of the administrated price. Note also that no minimum level of fee is mentioned in the Proposal. Therefore, there is no clear-cut safe-harbour for the European patent.⁷ A low level of renewal fee for Community patents would undoubtedly threaten the existence of the European patent.

In principle, National Patent Offices are neutral players in the competition between the European and the Community patent. They will receive half of the renewal fees collected by the EPO for both patents. However, in case the European patent disappears, one cannot exclude that some National Patent Offices will agree to lower their fees to create bunches of national patents at a lower price. Counter-intuitively, such a strategic move could be welfare enhancing. It may fill a need (in fact the need for a European patent!) and the corresponding lower standard quality of examination will be in line with the lower geographic scope and therefore lower the costs of errors.

6. Conclusion

The debate on patent reform in Europe needs to be more focused on its economic purpose: the promotion of innovation. This is what we did in this paper. We unfolded sub-issues and trade-offs underlying the general and consensual goal which “promoting innovation” is. In the light of this analysis, we discussed the relevancy of various policy levers.

We recalled that a patent system can promote innovation in two different ways, namely by creating exclusivity on innovations and by favouring their diffusion. Undertaking economically relevant reforms therefore requires as a first step that the European patent system be thought of as a patent regime striking a specific balance between exclusion and diffusion. The patent system must furthermore take into account specific needs at the microeconomic level. The access of SMEs to patents could for instance be facilitated. We also argued that patents play a major role in the organisation of collective research in high-tech industries.

⁶ We assume here to simplify that litigation costs are the same for the European and the Community patent.

⁷ It is important to notice, however, that the European patent will remain more flexible: whenever market expectations are not reached in some countries, the European patent-holder will be able to stop the payment of renewal fees whereas the Community patent-holder would have to renew the fee even to keep his invention protected in a single country.

This justifies specific efforts as regards patent examinations and the management of patent databases in biotechnology or information and communication technologies.

The patent system offers various policy levers to tackle these different needs. We argued that the fees charged to patentees should be considered as one such lever rather than as a price charged for a service. Severing the fees from the financing of Patent Offices would rule out wrong incentives within the Offices. It would furthermore facilitate the modulation of fees in function of the filers’ needs, and a better control of patents quality. In our view, the articulation between the national, European and Community patent systems is another neglected policy lever, which wrong management could generate inefficiencies. Translations of Community patents should be undertaken only when their social benefit in terms of information diffusion outweighs their cost. Innovators should moreover have a fair choice between patent protections at a narrow or wide geographical scale. As the draft rules regulating Community patent fees will probably eliminate the European patent system within the EU, we can expect the national patent systems to fill the gap and provide lower quality patents for small geographical areas.

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