

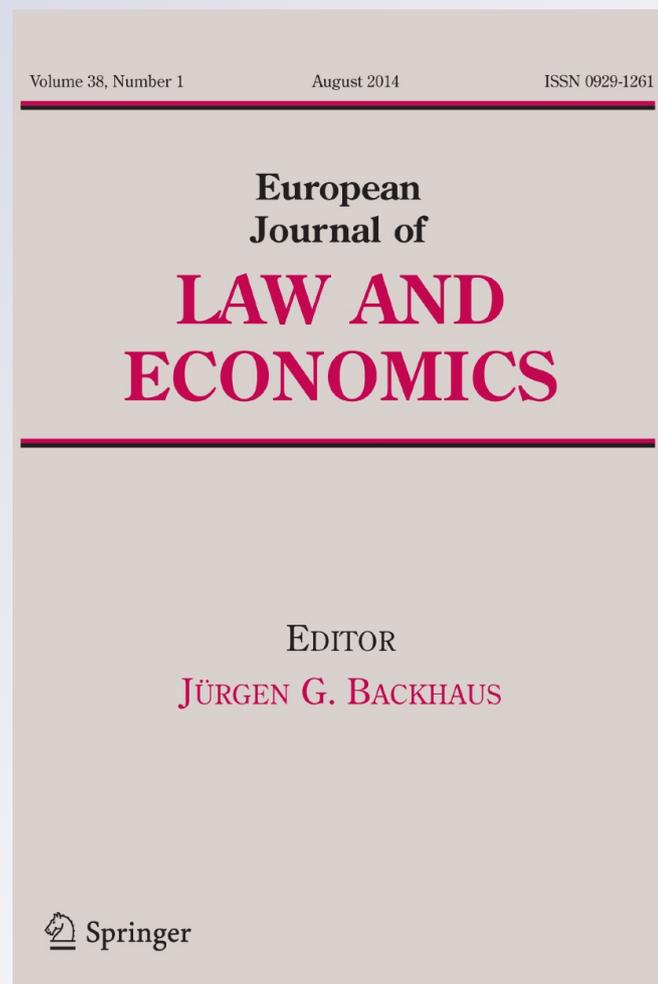
*Linguistic justice in IP policies: evaluating the fairness of the language regime of the European Patent Office*

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## Linguistic justice in IP policies: evaluating the fairness of the language regime of the European Patent Office

Michele Gazzola · Alessia Volpe

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**Abstract** Alternative intellectual property laws relating to the use of languages in IP organisations can result in an asymmetric distribution of costs of patenting between innovators. We present a framework for the characterisation and evaluation of the fairness of the language regime of the European Patent Office (EPO), which is currently based on three official languages: English, French and German. We estimate that the costs of access to patenting procedures borne by English-, French- or German-speaking applicants are at least 30 % lower than those borne by European applicants whose first language is not one of the current official languages of the EPO. In order to correct language-related cost asymmetries, we explore two possible alternative language regimes. In both cases, we introduce a centralised system of financial compensation that covers translation costs borne by European applicants whose first language is not one of the official languages of the EPO. In the first alternative, financial compensation is covered by savings on current translation costs at the granting stage. In the second alternative, the number of official languages is increased to five and financial compensation is funded by an increase in filing fee and by partial savings on translation costs at the granting stage. We show that both alternatives could substantially reduce language-related costs asymmetries among European applicants. In addition, we show that the five-language alternative would reduce the global costs of access to patenting procedures borne by all European applicants. Thus, more multilingualism can be cheaper than less multilingualism, provided that “implicit costs” are taken into account.

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We conclude discussing under which conditions the alternative language regimes proposed could have a positive impact on the effectiveness and the cost-effectiveness of the EPO language regime.

**Keywords** European Patent Office · European patent · Translation costs · Fairness · Patent information · Language policy · Linguistic Justice

**JEL classification** H40 · H89 · K11 · O30 · O31 · O34 · O38 · O39 · O52 · P48 · Z18 · Z19

### Abbreviations

CLIR	Cross-lingual information retrieval
EPC	European Patent Convention
EPO	European Patent Office
LA	London agreement
MT	Machine translation
PATLIB	Patent libraries
PCT	Patent cooperation treaty
SME	Small and medium enterprise
WIPO	World intellectual property organisation
IP	Intellectual property

## 1 Introduction

Alternative intellectual property (IP) laws relating to the use of languages in IP protection can have differing effects on inventors. For example, the language policy of a given international IP organisation can cause asymmetries to develop between the costs for access to IP protection borne by applicants whose first language is one of the official languages of the organisation compared to those inventors whose first language is not one of its official languages. This, in turn, can create a language-related cost bias among competing inventors.

The role of languages in IP policies has remained relatively under-explored in literature on IP systems and as yet no systematic attempt has been made to characterise (let alone evaluate) language policies of IP institutions as having the possibility to generate winners and losers. Contributions hailing from applied linguistics that explicitly deal with the role of languages in IP policies have addressed questions such as translation problems related to the legal and technical nature of patents (cf. Aragonés Lumeras 2009; Gourdin-Lamblin 2005; Houbert 2002 and several contributions in Jullion 2005). On the other hand, the few contributions anchored in the social sciences focus most often on the estimation of translation costs borne by patentees to validate European patents granted by the European Patent Office (EPO) in various European countries (cf. Van Pottelsberghe and Mejer 2010; Van Pottelsberghe and François 2009; Harhoff et al. 2009; Guellec and Van Pottelsberghe 2007).

This article aims at filling the gap in this research area. We address the question of fairness of language policies—or “linguistic justice”, using a term of the specialised literature (e.g. Pool 1991; De Briey and Van Parijs 2002; Gazzola and Grin 2007)—of multilingual IP organisations, focusing on the EPO. We hasten to clarify that, in line with the literature in economics and policy analysis, there is no moral or ethical content in the notion of “fairness” (Just et al. 2004). Assessing fairness simply implies identifying who loses, who gains, and (if possible) how much, and how the costs of alternative policies are shared among individuals or groups.

We present a framework for the evaluation of the distributive effects of the language policy (or “language regime”) of the EPO, which is currently based on three official languages, namely, English, French and German, and we estimate that the costs of access to patenting procedures borne by English-, French- or German-speaking applicants are at least 30 % lower than those borne by European applicants whose first language is not one of the current official languages of the EPO. In order to correct such asymmetries we explore two possible alternative language regimes. We show that both alternatives could substantially reduce language-related costs asymmetries among European applicants. In addition, we show that, under certain conditions, increasing the number of official languages would reduce the total costs of access to patenting procedures borne by all European applicants. This article is organised as follows. Section 2 presents the current language regime of the EPO. Section 3 characterises the distributive effects related to the language regime of the EPO. In Sect. 4 we assess the magnitude of these effects through a comparative analysis of alternative language regimes. In addition, we discuss which countries could be interested in supporting a reform of the current language regime of the EPO, and which possible changes in the management of patent information could be implemented to improve access to patent literature. Section 5 summarises and discusses under which conditions the alternative language regimes proposed in Sect. 4 could increase the cost-effectiveness of the language regime of the EPO.

## 2 The language regime of the EPO

The EPO is a regional patent granting authority whose purpose is searching and examining European patents applications on behalf of the 38 Contracting States of the European Patent Convention (EPC).<sup>1</sup> The EPO language regime identifies three official (or procedural) languages, namely, English, French and German. Official languages of the Contracting States of the EPC that are not English, French or German are named “admissible non-EPO languages”. Patent applications must be filed in one of the official languages or, if filed in any other language, translated within two months into one of the official languages of the EPO (Rule 6 EPC). The official language of the EPO in which the European patent application is filed (or

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<sup>1</sup> The European patent should not be confused with the EU unitary patent (once “community patent”). At the moment of writing, a unitary patent is still not a reality, although considerable progresses have been made in December 2012. Therefore, it is not discussed here. Lack of unanimous consensus on the language regime of the EU patent has been one of the main obstacles against the development of a common EU patent throughout history (European Commission 2011, Volpe 2011).

translated, if the language used in filing is not English, French or German) will be used for all proceedings, and the patent application will be published in the official language chosen by the applicant.

During the examination procedures of patent applications carried out by the EPO, communication between the applicant and the EPO takes place in the official language chosen by the applicant. If a patent application fulfils the requirements of the EPC, the patent is granted, provided that the applicant has filed translation of the claims into the other two official languages of the EPO in time. For example, if the applicant has chosen German as the procedural language of the application, he/she must provide translation of claims in French and English. Hence, at the moment of grant, all European patents are available only in one of the EPO official languages but all claims are always available in the three official languages. The language used in opposition and appeal proceedings usually is the procedural language chosen by the applicant for his application.

European patents granted by the EPO are a “bundle” of national patents that have to be validated in the states designated by the patentee after being granted. Such validation includes the payment of validation and renewal fees and in some cases the translation of the whole patent (or part of it, typically claims) into one of the official languages of the country concerned. Some EPC states waived all translation requirements for validation; those states are parties to the Agreement on the application of Article 65 of the EPC, commonly called the London Agreement (LA).<sup>2</sup> However, the decision to ratifying the LA belongs to the individual EPC member states and therefore, strictly speaking, it does not concern the language regime of the EPO.

### 3 Costs and distributive effects of language regimes

There are several types of costs associated with patenting procedures.<sup>3</sup> For reasons of space, we should mention only “procedural and maintaining” costs such as filing fee, fee for search, and examination fee, and “intermediation costs” associated with services provided by legal advisors and patent attorneys. A class of costs which is more relevant for our discussion concerns translation and interpreting costs. We identify two major types of costs for language regimes of multilingual organisations, that is:

1. Primary costs are the sum of direct costs of a language regime (e.g. translation and interpreting services), plus indirect costs, such as a given share of common administrative structures, or overheads directly associated with translation and interpreting services. As far as outsourced language services are present in the budget of the organisation considered, they can be included in primary costs.

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<sup>2</sup> The LA, signed in London in 2000, came into force in 2008. Today 18 states have ratified or accessed the LA. Ireland has recently adapted its national law in accordance with the LA and a ratification is expected in the future. Only nine states have decided to completely dispense with translation validation requirements (namely, Ireland, Lichtenstein, Luxembourg, France, Germany, Monaco, Switzerland, and the UK). The remaining nine countries still request at least a translation of the claims into their official language, and sometimes a full translation into English.

<sup>3</sup> See Van Pottelsberghe and François (2009: 338-347) and Roland Berger (2004) for a review.

**Table 1** Types of implicit costs linked to the language regime of the EPO, by phase of the patenting process and by type of agent

Phase	Costs for the applicant	Costs for third parties
Prior to filing	Information costs	
The applicant files a patent application	Admission costs	
The EPO carries out formalities, search for anteriority and search reporting	Interaction costs	
The EPO publishes the patent application		Information costs
The EPO carried out substantial examination of the application	Interaction costs	
The EPO grants the patent	Granting costs	Information costs
Appeal by the applicant (optional, if grant is refused)	Interaction costs	
Opposition by third parties (optional)	Interaction costs	Interaction costs

Source Adapted from Gazzola (2011). The table presents the case of an applicant who must interact with the EPO in a language which is not his first language

2. Implicit costs, defined as costs borne by “decentralised agents” (e.g. individual inventors, companies, universities, and research institutions) that arise from interacting with a “central authority” (e.g. a patent office). Following Gazzola (2011), we define four types of implicit translation costs are associated with the management of multilingual communication by the EPO:<sup>4</sup>

- Admission costs: costs to translate patent applications into one official language at the time of filing.
- Interaction costs: translation and interpreting costs connected to the flows of communication between decentralised agents and the central authority for (1) intermediate communication during the procurement procedure, (2) amendments to claims, (3) oppositions and appeal procedures.
- Information costs: cost related to access to existing patent literature available in a language that users do not understand. Information costs arise for searching for a technical solution in prior art; drafting a new application; patent landscaping; freedom-to-operate analysis; and opposition purposes.
- Granting costs: translation of claims into the two other official languages of the EPO.

Table 1 above summarises the types of costs linked to the language regime of the EPO by phase of the patenting process (assuming that the patent application is not withdrawn or rejected, and that the applicant has to interact with the EPO in a language which is not his first language). For sake of clarity Table 1 illustrates the basic scenario of a patent application filed directly at the EPO (“Euro-direct route”) without claim of national priority.<sup>5</sup>

<sup>4</sup> Often measuring implicit costs is not straightforward as translation costs are often included in intermediation costs paid to patent attorneys (Van Pottelsberghe and François 2009: 339).

<sup>5</sup> We also do not discuss here procedures for “Euro-PCT applications”, that is, international patent applications filed according to the Patent Cooperation Treaty (PCT) that enter into the regional phase with the EPO.

In this article, we do not discuss translation costs related to validation and litigation procedures, as strictly speaking they do not refer to the language regime of the EPO as an organisation, but rather to the language regime of the national patent offices. However, they must be taken into account when one analyses the European patent system as a whole, as validation translation costs can be considerable.<sup>6</sup>

Language regimes can cause asymmetries to develop between the implicit costs borne by decentralised agents (identified in terms of their linguistic attributes). Depending on the number of official languages adopted by the central IP authority, the extent of translation of documents supplied and the system of financial compensation for translation costs (if any), the implicit costs can be distributed very differently among groups of decentralised agents. In our approach, fairness of alternative language regimes is assessed precisely on the basis of their impact on the distribution of implicit costs among agents. We can identify three channels through which a language regime of a patent office can entail distributive effects, that is:

1. “Access to patenting procedures”. Depending on the language regime used by the central authority, the translation costs associated with patenting procedures (that is, admission, interaction, and granting costs) can be distributed very differently among applicants.
2. “Access to patent information”. Language policy determines the language in which patent applications and patents granted can or must be published, and it affects the extent to which patent documents (or parts of them) must be translated. Thus, it influences indirectly the stock of technical and legal information available in a given language, and therefore the relative information costs borne by applicants. Innovators who can readily access patent information without incurring information costs and time-consuming efforts have a competitive advantage over innovators who cannot have access to information in a language that they master. This ultimately can affect innovation output patterns and patent behaviour. Access to patent information can be improved through machine translation (MT). However, MT appears insufficient for an in-depth analysis of patent information, since “it is generally agreed that, in commercial contexts, machine translation output still needs to be post-edited in order to be acceptable to, and usable by, end-users” (Doherty and O’Brien 2012: 1).<sup>7</sup> Asymmetries in information costs can be mitigated by generalising access to information for all users in spite of their language attributes. Actions aimed at improving the management of the European patent information system will be discussed later in this article.
3. “Power in negotiations and opposition procedures”. Patents are documents of technical nature, but they also define the extent of the legal protection granted to the invention. As a result, claims are written in such a way that they are wide

<sup>6</sup> On this point and on the effects of the LA on validation costs, see Roland Berger (2004), Guellec and Van Pottelsberghe (2007), Harhoff et al. (2009), Van Pottelsberghe and Mejer (2010).

<sup>7</sup> See Doherty and O’Brien (2012) for a review of different experiments comparing the efficiency and user satisfaction of MT with human translation. See also WIPO (2008) for a critique to MT in IP policies, and Marlies (2012) for a comparison between MT and human translation of patents at the EPO.

enough to cover a potential substitute or alternative features of the inventions and to broaden the scope of legal protection to the maximum. As Combeau notes “sometimes ambiguity is part of the job. The drafter has to know how not to be too precise: he could regret it 10 or 15 years later” (Combeau 2007: 67). Hence, claims are often vague and a full mastery of the procedural language used in drafting claims is essential. Those who cannot use their first language in negotiations and procedures must face interaction costs. In addition, an excellent command of procedural languages is also necessary in oral proceedings in case of opposition and appeal, unless (and perhaps even if) interpreting is provided.

#### 4 Assessing the fairness of the language regime of the EPO

One of the basic steps in any policy evaluation is to define the scope of the analysis. This requires identifying the territory to which the analysis is limited as well as the persons or entities “with a standing”, that is, whose benefits and costs count (Boardman et al. 2006: 7–18; Whittington and MacRae 1986). The computation of costs and benefits of policies may turn out to be impossible if no appropriate group with standing has been identified. In our view, the relevant agents with a standing in an evaluation of the EPO language regime are applicants (individual inventors, firms, universities and research centres) who are resident in one of the 38 Contracting States of the EPC.

In this section, we work with the assumption that decentralised agents can be identified according to their linguistic attributes, and more precisely on the basis of the official language(s) of the state where they are based. We discuss later the implications of relaxing this hypothesis. The relevance of the assumption made here lies in its practical usefulness and consistency with EPO rules of procedures. The assumption that natural but also legal persons (such as firms) have a “first language” emerges in several regulations of IP institutions, in particular when some translations are requested for procedural reasons. For example, Article 14 of the EPC states that “natural or legal persons having their residence or principal place of business within a Contracting State having a language other than English, French or German as an official language, and nationals of that State who are resident abroad, may file documents which have to be filed within a time limit in an official language of that State”. The current language regime of the EPO provides that, under certain conditions, natural or legal persons mentioned in Article 14 of the EPC may benefit from a reduction of 20 % in some (but not all) fees if they incur translation expenses. In particular, we should mention a reduction of 40 euros for filing fees,<sup>8</sup> and EUR 311 for examination fees.

Let us assess the fairness of the current language regime of the EPO. The average number of pages of a patent application filed with the EPO has increased during the last decades from 14 in 1988 to 30 in 2002 (Van Zeebroeck et al. 2009: 1007).

<sup>8</sup> This applies only if an application contains less than 16 claims and for EP direct—not online applications.

The mean value of pages for this period is around 20 pages,<sup>9</sup> of which four pages for claims. The average cost of translating a page of a European patent application is EUR 85 (European Commission 2011, adapting Roland Berger 2004). Thus, the average cost for translating an application, or “admission cost” in our terminology, is EUR 1,700, which is not fully covered by the reduction in filing fees (EUR 40). In addition, applicants using one of the admissible non-EPO languages in filing have to bear interaction costs during the examination phase which are likely to be higher than the current EPO compensation (EUR 311). Other fees to which a reduction to compensate translation costs is applicable are opposition fee, appeal fee, fee for the petition for review or the limitation or revocation fee. However, these fees concern post-grant optional procedures, and they will be ignored in our comparative analysis.

As a result, the current language regime of the EPO entails substantial distributive effects among European applicants at all three levels presented in the previous section. At the “access to patenting procedures” level, admission and interaction translation costs are distributed asymmetrically among applicants. Existing reductions in fees are not sufficient to compensate admission and interaction costs borne by European applicants whose first language is not English, French or German. On the contrary, granting costs are distributed equally. At the “access to patent information” level, disparities exist in terms of information costs. Claims are available only in English, French and German, and applications drafted in any admissible non-EPO language are published only in the procedural language elected. The original texts of these applications in admissible non-EPO languages are not always available on the two most widely used EPO databases (*Espacenet* and *European Patent Register*). Further, they are not necessarily easily retrievable on the databases of national patent offices, because the conditions of accessibility to digital information are not homogeneous among patent offices. The impact of information costs asymmetries influences information monitoring activities, affecting, in turn, companies patent behaviour to a varying extent. Finally, distributive effects occur also at the “power in negotiations and opposition procedures” level. For example, the language used in the oral proceedings is the official language chosen by the applicant, and interpreting services are provided only in the three procedural languages. The parties can also use other languages (like, Spanish or Polish) for oral proceedings, but at their own expense, thus incurring in additional interaction costs.

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<sup>9</sup> The estimates of the average number of pages of a European patent application for the period considered varies according to authors: 21,45 (Van Zeebroeck et al. 2009: 1008); 22,5 (Archontopoulos et al. 2007: 126), 25 (Van Pottelsberghe and Mejer 2010: 230), of which 15 for description and 4 for claims and 6 for drawings, and 23 (Roland Berger 2004: 81) of which 15 for description and 4 for claims. In this article, we adopt the prudent estimates of Van Pottelsberghe and Mejer and Roland Berger, which have already been used in the accompanying documents to a proposal for a Council regulation implementing enhanced cooperation in the area of the creation of unitary patent protection with regard to the applicable translation arrangements (European Commission 2011). We include in our computation of admission costs only one page of drawings and explanatory notes. Considering the increase in the average number of pages of patent applications pointed out by Van Zeebroeck et al. (2009), therefore, our estimates should be viewed as a lower bound.

#### 4.1 Exploring alternatives

The language regime of the EPO has never been modified, with the exception of the EPC 2000 reform, which, in any case, did not bring about any change in the language rules applied to EPC Contracting States.<sup>10</sup> Thus, in order to carry out a comparative analysis of the distributive effects of alternative language regimes, we must work with some hypothetical terms of comparisons (or “counterfactuals”). To our knowledge, no data are available for a fully-fledged evaluation in which all three levels of fairness presented in the previous section can be taken into account. However, some data exist to assess fairness at level of admission to patenting procedures. Let us discuss three language regimes (or scenarios), defined as:

- *Scenario 1* “Status quo”. It corresponds to the current language regime of the EPO.
- *Scenario 2* “EPO no claims”. This regime is based on the current three official languages of the EPO with compensation transfers for applicants residing in EPC Contracting States that have no official languages in common with the EPO. No translation of claims into the other two official languages of the EPO is required at the moment of grant.
- *Scenario 3* “EPO 5”, corresponds to a language regime with more official languages, for example, five. We assume for the sake of the example that the five official languages of the “EPO 5” language regime are Dutch, English, French, German and Italian, corresponding to the top five groups of European countries (defined in terms of their official language), to which European patents have been granted (cf. Table 3 below). This scenario provides full compensation for translations costs for European applicants whose working language is not one of the five official languages of the EPO. In this scenario, it is not necessary to translate claims into the other four official languages of the EPO at the moment of grant, but only the title and the abstract. To some extent, this language regime reminds that of the PCT system.<sup>11</sup>

In scenarios 2 and 3, the current filing and examination fees reductions are not necessary. Other reductions in fees are not considered, as opposition and appeal are optional steps.

We compare three applicants defined according to their first language. In what follows, we compare “monolingual” applicants, that is, applicants working in one language. If this language is not one of the official languages of the EPO, applicants must buy translation services on the market to communicate with the EPO (we relax this assumption later in this section). Let us assume that applicant “A” speaks English, French or German, applicant “B” uses Dutch or Italian, applicant “C” employs any other official languages of one of the EPC countries, for example,

<sup>10</sup> The “EPC 2000 reform” entered into force in 2007. Before that year, it was not possible to file “Euro-direct” patent applications in languages that are not one of official languages of the EPC Contracting States (e.g. Japanese). A different rule was in force for “Euro-PCT” applications.

<sup>11</sup> At the moment of publication of international patent applications in one of the ten PCT languages of publication, only abstracts and titles are translated into the two working languages of the WIPO International Bureau, namely, English and French.

Spanish or Polish. As explained in the previous section, we set the average cost of translating patent application (admission translation cost) at EUR 1,700.

*Scenario 2* (“EPO no claims”). From 2006 to 2010,<sup>12</sup> the EPO has granted on average 57,568 European patents per year, of which 30,384 to applicants from EPC countries.<sup>13</sup> We work under the conservative assumption that the average number of grants per year will vary around this mean between 2011 and 2015. As the average granting translation cost is EUR 680 (4 pages\*85 EUR\*2 translations of the same claims into the other two official languages), adopting scenario 2 would imply a total aggregate saving of EUR 39.2 million per year (680 EUR\*57,568 patents). The current fee for granting and printing is EUR 875 if the application has not more than 35 pages. Let us assume that the EPO increases the fee for granting and printing to EUR 1,555 (875 + 680 EUR). As EUR 680 would have been paid anyway for the translation of claims into the other two official languages of the EPO, the aggregate costs for applicants does not change, and no one is worse off.

In this scenario, the EUR 39.2 million collected through extra granting fees are used to compensate admission and interaction translation costs borne by European applicants whose language is not English, French or German. From 2006 to 2010, on average 130,591 European patents applications were filed every year with the EPO, of which 61,120 by residents of an EPC Contracting State. The applications filed by applicants from EPC countries that do not have a language in common with the EPO were 17,934 on average. Dividing EUR 39.2 million by 17,934 applications, we get EUR 2,183 per application filed by European applicants whose first language is an admissible non-EPO language.

As a result, the “EPO no claims” language regime would allow to fully compensate admission translation costs borne by European applicants whose working language is an admissible non-EPO language. The difference between EUR 2,183 and the translation admission costs (EUR 1,700) is EUR 483. This amount should be viewed as a lump-sum transfer to cover other implicit translation costs, for example part of interaction costs during the examination phase (e.g. amendment of claims), if the European application enters such phase.<sup>14</sup> In practice, this language policy amounts to a transfer of resources from non-European and European German-, French- and English-speaking applicants towards other European applicants that reduces inequalities due to the current language regime.

Note that no assumption has been made regarding the language in which the application has been filed. For example, a Portuguese company filing a Euro-direct application in English should also be eligible for a reduction in fees equal to EUR 2,183 (recall that translation admission costs are often included in the fees of patent

<sup>12</sup> Working with a year average based on more than one year is analytically more robust than relying on one year only. On the other hand, the time span considered should not be too high. Five years seems to be a reasonable choice.

<sup>13</sup> If not specified differently, figures in this article have been computed by the authors using the EPO statistical database. The authors gratefully thank the EPO statistical service for access to these data.

<sup>14</sup> Not all applications enter the examination phase, as withdrawals after the publication of the European Search Report are not uncommon. Hence, many companies would not receive EUR 483 of compensation and saving could be used to increase the lump-sum transfer in favour of companies that enter the examination phase. Thus, EUR 483 must be regarded as a lower bound.

attorneys). Clearly, intermediate solutions are also possible. For example, the EPO could completely refund translation costs, up to a certain limit, only if the applicant can justify translations of the application and subsequent amendments of claims from an admissible non-EPO language into English, French or German, and provide lump-sum compensation for interaction costs only if the application successfully passes the examination phase.<sup>15</sup>

*Scenario 3* (“EPO 5”). In this scenario, the number of the EPO official languages is increased. This would automatically entail four effects. First, the translation and interpreting costs borne by applicants that work in Dutch or Italian are eliminated. Second, it is not necessary to translate claims into the other four official languages of the EPO at the moment of grant, but only the title and the abstract. Assume that a title and an abstract can be contained in half of a page. Thus, translating them into four languages would cost EUR 170. This entails a yearly aggregate saving equal to EUR 29.4 million  $((680-170 \text{ EUR}) \cdot 57,568 \text{ patents})$ .

Third, the primary costs of the language regime would increase. The EPO should translate official communications such as the annual report and publications in the *Official Journal* into two additional languages, and it must provide interpreting into and from the five official languages for the meetings of the Administrative Council, oral proceedings and other situations in which interpreting is required. Primary costs of the current language regime of the EPO can be estimated at EUR 14.6 million per year (Gazzola 2011). A language regime based on three languages requires interpreting and translation for six linguistic combinations (C), following the formula  $C = n(n-1)$ , where  $n$  is the number of languages. This implies an average annual cost of EUR 2.4 million per combination. Providing interpreting and translations into and from five official languages would imply 20 combinations, at the cost of EUR 48.7 million. Thus, the extra primary cost associated with language regime 3 is EUR 34.1 million (EUR 48.7–14.6 million).

One could argue that an extra cost of EUR 34.1 million is too high, as many internal documents are drafted in one language only (e.g. English) and then translated into other languages (thus, the number of combinations to cover would normally be less than 20). However, it is likely that in scenario 3 examiners will also require some form of assistance from the language department. The current language regime of the EPO provides that all examiners must be able to work in English, French and German. It is not realistic to require all examiners to be fluent in five languages. Some applications in Dutch or Italian could be processed by existing Dutch-speaking and Italian-speaking examiners,<sup>16</sup> but in other cases it is likely that the translation service would have to provide linguistic support. Hence, for lack of better data, we assume that EUR 34.1 million is an adequate approximation of the extra primary cost to be covered in scenario 3.

Fourth, scenario 3 provides for compensation of admission and interaction translation costs incurred by European firms residing in a country in which Dutch, English, French, German and Italian are not official languages. Between 2006 and

<sup>15</sup> In order to avoid frauds, the EPO should strengthen controls already in force regarding the current eligibility to reductions in fees.

<sup>16</sup> In 2009, 19% of the EPO staff with grade A was Belgian, Dutch or Italian (EPO 2010a: 47).

2010, on average 10,014 European applications were filed by applicants from EPC Contracting States where Dutch, English, French, German or Italian are not official languages. Providing compensation equal to EUR 2,183, as in scenario 2, would require an extra fee income of EUR 21.9 million per year (2,183 EUR\*10,014 applications).

To summarise, scenario 3 requires EUR 34.1 million to cover extra primary costs due to two additional official languages, and EUR 21.9 million to implement compensation in favour of European applicants from EPC countries that do not use Dutch, English, French, German or Italian as their main working language (total EUR 56 million). These extra costs could be covered by extra filing and search fees. Assuming, as in scenario 2, that the average number of applications filed will remain relatively constant between 2011 and 2015, this would imply an increase in the filing fee equal to EUR 428 per application filed (EUR 56 million/130,591 applications). However, with respect to the status quo, firms A, B, and C save EUR 510 (EUR 680-170) as a result of the fact that only titles and abstracts must be translated (and not claims). In practice, this language policy would entail a shift in costs from the granting stage to the filing stage, and a decrease in the total costs borne by European patentees. Only European users whose patent application successfully passes the examination phase will save EUR 510 with respect to the status quo, whereas all applicants should pay an extra fee equal to EUR 428 at the moment of filing.

Table 2 below shows the results of the comparative analysis, assuming that the patent application filed by applicants successfully pass the examination phase. General fixed costs (EUR 5,500) cover application, search, examination, grant and renewal fees up to the fifth year of the patent life (European Commission 2011, adapting Roland Berger 2004). In scenario 2, fixed costs are higher than in other scenarios, as we have assumed that savings from the translation of claims into two official languages of the EPO are offset by an equal increase in the granting fee.

Flows of communication between companies and the EPO may occur at different stages after the filing of a patent application, including, for example, intermediate communication or amendments to claims. We have called translation costs associated with intermediate communication “interaction (translation) costs”. To our knowledge, no data regarding these costs are available, but it is not likely that information costs are zero. For the purposes of our analysis, we assume that on average they do not exceed EUR 483, that is, the difference between the lump-sum transfer (EUR 2,183) and the cost for translating the entire application (EUR 1,700). In practice, we assume that the lump-sum transfer is enough to offset differences in admission and interaction costs between applicants in scenarios 2 and 3. This assumption is arbitrary, but we have to bear in mind that the goal of our analysis is to compare the relative position of the three applicants in each scenario rather than to provide exact estimates. In other words, the relevant question is how the relative position of applicants changes under each scenario, given a certain set of assumptions. We will discuss later the implications of relaxing this hypothesis.

In the *status quo* situation, B and C are disadvantaged with respect to A. The difference of total costs between users is 30 %. In scenarios 2 and 3 we set interaction costs to EUR 483, and therefore, by definition, the compensatory

**Table 2** Comparative analysis of the costs of three alternative language regimes for the EPO (in euros)

Language regime	Status quo			EPO no claims			EPO 5		
	A	B	C	A	B	C	A	B	C
	Type of costs/Applicant								
Admission translation costs	0	1,700	1,700	0	1,700	1,700	0	0	1,700
Current filing fee reduction	0	-40	-40	0	0	0	0	0	0
Granting translation costs	680	680	680	0	0	0	170	170	170
General fixed costs	5,500	5,500	5,500	6,180	6,180	6,180	5,500	5,500	5,500
Current examining fee reduction	0	-311	-311	0	0	0	0	0	0
Lump-sum compensation	0	0	0	0	-2,183	-2,183	0	0	-2,183
Interaction translation costs	0	483	483	0	483	483	0	0	483
Extra filing and search fee	0	0	0	0	0	0	428	428	428
Total	6,180	8,012	8,012	6,180	6,180	6,180	6,098	6,098	6,098
Difference between A and B	30 %			0 %			0 %		
Difference between A and C	30 %			0 %			0 %		
Difference between B and C	0 %			0 %			0 %		

*Source* Authors' own calculations on the basis of Gazzola (2011). Applicant "A" speaks English, French or German, applicant "B" uses Dutch or Italian, applicant "C" employs any other official languages of the EPC Contracting States

transfer of EUR 2,183 fully covers admission and interaction costs borne by B and C. Since general costs are also equal for all applicants, no one is disadvantaged. Note that the total cost for B and C, in absolute value, is *lower* than in scenario 1. We do not have data on interaction costs borne by applicants whose language is not English, French or German. If this cost is higher than EUR 483 and the maximum compensation is EUR 2,183, scenario 2 does not completely cancel disparities between the three firms. By contrast, if it is lower than EUR 483, B and C will benefit more than A from scenario 2, unless we introduce the rule that compensation should cover translation costs only if they have really been incurred.

In scenario 3, no European applicant is in a disadvantaged position. In addition, the average total cost for *all* European users is lower in this scenario than in scenario 1. Thus, an increase in the number of official languages, if accompanied by compensation transfers and by a relative reduction in granting translation costs, would not only cancel differences between A on the one hand and B and C on the other hand, but it would also reduce, on average, the total costs incurred by all European applicants whose patent applications successfully pass the examination phase. An important result of our analysis is that increasing the number of official languages is not necessarily more expensive for decentralised agents concerned. Hence, if the comparison among language regimes is based on a comprehensive notion of cost, more multilingualism can be less expensive than less multilingualism.

In summary, both scenarios 2 and 3 could reduce some disparities among European users due to the current language regime. Obviously, several intermediate solutions can be designed; for example, the EPO could keep the current language regime and introduce a system of full compensation for admission and interaction costs funded through an increase in filing and searching fees.

Let us note incidentally that a scenario “English-only”, that is, a language regime with English as the sole official language of the EPO, would not solve the problem of linguistic justice. The cost for a European patent for an English-speaking applicant would be EUR 5,500 (corresponding to “general fixed costs” in Table 2), but the costs for all other applicants would be obviously higher. First, applicants must provide a translation into English at the average cost of EUR 1,700. In addition, they would face interaction costs (set at EUR 483). The total cost of an English-only language regime for a French- or German-speaking applicant would therefore be EUR 7,332,<sup>17</sup> that is, 33 % higher than their English-speaking competitors. Hence, an English-only language regime would increase inequality among applicants, and it would not cost less than scenarios 2 or 3 to European non-English-speaking applicants.

Some conclusive remarks are in order. One could argue that companies, and especially the large ones, may rely on internal multilingual or international staff,<sup>18</sup> including patent attorneys, who are capable of drafting texts and communicating orally in more than one language (often including English). Thus, they do not need to turn to the market for translation, and demand for translation services from these

<sup>17</sup> We keep the current reduction in fees available at the EPO, as shown in scenario 1. The total cost of EUR 7,349 is equal to  $(5,500 + 1,700 + 483) - (40 + 311)$ .

<sup>18</sup> On multilingual practices on the workplace see, among others, Grin et al. (2010) and several contributions in Lüdi (2010).

companies may be lower than from “monolingual” firms, that is, firms employing mostly monolingual staff or employees with limited proficiency in foreign languages. Nevertheless, this does not imply that translation and interpreting costs are zero or that the concept of implicit cost is redundant. As all other things being equal, multilingual staff on average is “more expensive” than monolingual staff, as multilingual employees tend to be paid more (cf. Grin et al. 2010: 55–71 for a review). In addition, companies may turn to professional translators at least for editing and quality check activities. Finally, drafting documents in a foreign language may require more time, which is taken away from other activities. Hence, even in the case of multinational corporate actors relying on multilingual staff, the category of implicit costs remains a relevant one. The same conclusion applies if enterprises purchase legal services from external accredited patent attorneys.

#### 4.2 The linguistic profile of European patentees

The claim is sometimes made that English is already the most frequently used language in patenting procedures at the European level, and that an English-only language regime would correspond to real-life practices. We have already shown that an English-only language regime would not solve the problem of linguistic justice. In this section, we will show that the linguistic profile is more complex and multifaceted. We identify the groups of European users who could potentially support a reform of the EPO’s language regime, focusing on “European inventors”, that is, natural or legal persons having their residence or principal place of business within an EPC Contracting State. We group EPC Contracting States according to their official language(s) rather than to analyse them separately, as a language regime has an impact on the relative position of applicants defined according to their first language rather than their nationality. For European countries with more than one official language (e.g. Belgium, Finland, Luxembourg, Switzerland), the number of patents granted according to the percentage of the population speaking one of the official languages of the Contracting State as first language or primary language of education.

In this section, we use patents granted as an indicator of innovation, as it is a more accurate indicator than patent applications. Patent granted, in fact, refer to inventions that have been thoroughly examined and judged truly useful, novel and non-obvious. The first European patent application was filed in 1978 and the first patent was granted in 1980. From 1980 to 2010 the EPO has granted 1,048,542 European patents. Residents in one of the EPC Contracting States own 53.9 % of all European patent granted (564,814). Table 3 presents the proportion of European patents granted to European applicants from 1980 to 2010, by group of countries defined according to their official language(s). In order to track recent trends and changes, Table 3 reports also data from 2006 to 2010.

German-speaking countries own half of all European patents granted. French-speaking countries follow at a great distance. English-speaking countries are the third largest group of EPC owners of European patents, but the Dutch- and Italian-speaking groups follow very closely. The English-speaking group was overtaken by Italian-speaking countries in 2006 and by Dutch-speaking countries in 2007.

**Table 3** Proportion of European patents granted to European applicants, by applicant's country of residence (historical and recent trends)

Group of countries by official language	Percentage of European patent granted to European applicants (1980–2010) (%)	Group of countries by official language	Percentage of European patent granted to European applicants (2006–2010) (%)
German-speaking	50.4	German-speaking	49.9
French-speaking	18.1	French-speaking	17.0
English-speaking	8.8	Italian-speaking	7.5
Dutch-speaking	6.8	Dutch-speaking	7.1
Italian-speaking	6.6	English-speaking	6.8
Swedish-speaking	4.2	Swedish-speaking	5.0
Finnish-speaking Finland	1.7	Finnish-speaking Finland	2.4
Denmark	1.3	Denmark	1.5
Spain	0.8	Spain	1.2
Others	1.3	Others	1.6
Total (in absolute terms)	564,814		151,920

Source Adapted from Gazzola (2011)

Let us compare data regarding the share of European patents granted to European inventors by language group (Table 3) with figures on language use (Table 4 below).

English is clearly overrepresented at the European level. From 1980 to 2010, 28.9 % of European patents granted to European inventors were originally filed in English, but European English-speaking countries own only 8.8 % of all European patents granted to European inventors. This can be explained by the fact that several European inventors whose first language is not an official language of the EPO prefer filing directly in English for several reasons: (i) they know that a translation must be provided in any case, (ii) a translation in English is often already available if the application follows the Euro-PCT route.<sup>19</sup> In both cases, the use of English by non-English-speaking applicants, at least to some extent, is an effect of the language policy of the EPO or the PCT system.

The use of admissible non-EPO languages in filing patent applications varies across countries and it depends by the route chosen by applicants (Gazzola 2011). In 2010, for example, Spanish applicants filed in Spanish 64.4 % of their European patent applications that have eventually led to the grant of a patent (71 % for Euro-direct applications and 58.6 % for Euro-PCT applications respectively). In the same year, 37.8 % of applications filed by Italian applicants were in Italian (60.4 % for Euro-direct applications and 9.4 % for Euro-PCT applications respectively), 11.4 % of applications filed by Dutch applicants were in Dutch (23.8 % for Euro-direct applications and 7.3 % for Euro-PCT applications respectively), 13.3 % of applications filed by Swedish applicants were in Swedish (7.7 % for “Euro-direct” applications and 15.2 % for Euro-PCT applications respectively). Let us recall that Dutch, Italian and Swedish (contrary to Spanish) are not languages of publication of the PCT.<sup>20</sup>

The share of patents originally filed in German or French is slightly lower than share of patents granted to German- or French-speaking European inventors, as—for several reasons that cannot be discussed here<sup>21</sup>—an increasing proportion of applications filed by French- and German-speaking users are in English since the 2000s. In 2010, for example, 45.9 % of patents granted to Swiss inventors were originally filed in English (they were only 13.2 % in 1990). The share of applications

<sup>19</sup> One of the reviewers has suggested that many applicants file directly in English as they plan to file a patent application with the US Patent and Trademarks Office. Hence, a translation into English is needed anyway. This can be true, but it does not provide solid guidelines for the EPO language policy. First, not all firms are necessarily interested in patenting their inventions in the US (at least not at the same time they file an application with the EPO). Second, the possibility to use one's first language at the application stage makes it possible to postpone translation costs for several months. Third, postponing translation costs contributes to minimize the risk of deadweight loss of initial translation costs if the application is eventually rejected by the EPO.

<sup>20</sup> In order to file an international patent application through the PCT system, Italian, Swedish and Dutch applicants must translate their international patent application in one of the ten languages of publication of the PCT. When the international application enters into the regional phase with the EPO, they usually file directly the application already translated into one of the EPO's procedural languages, typically English.

<sup>21</sup> Cf. Gazzola (2011) for a more extensive discussion on the use of languages in European patenting procedures.

**Table 4** Languages in which European patents granted to European inventors were originally filed

Language	1980–2010 (%)	2006–2010 (%)
German	48.6	44.8
English	28.9	35.3
French	16.0	13.2
Italian	2.6	3.0
Dutch	1.3	0.9
Swedish	1.2	0.9
Spanish	0.5	0.9
Others	0.9	1.1

Source Authors' calculations.  
EPO statistical database

filed in English by French and German inventors has increased, respectively, from 1.6 to 16.5 % and from 1.5 to 11.4 % from 1990 to 2010. French and German applicants, however, largely prefer to file European patent applications in French and German respectively.

Data on patent applications published (but which have not necessarily led to a grant) provide a partially different picture, as shown in Table 5 below. The differences in language use between patent applications and patent granted can be explained by differences in the attitude of European applicants vis-à-vis patent protection, especially as regards the strategic use of patent applications. From 2006 to 2010, for example, the first six largest applicants were, respectively, German-speaking (46.1 %), French-speaking (16.5 %), Dutch-speaking (8.8 %), English-speaking (8.1 %), Italian-speaking (7.1 %) and Swedish-speaking countries (4.8 %). Patent applications, however, are not necessarily a precise predictor of future patent grants. Between 2000 and 2010, for example, the ratio between the number of patent applications filed by a country in year  $T$  and the number of European patent granted to that country in year  $T + 3$  is systematically lower for Britain and the Netherlands than for France, Germany, Italy and Switzerland. Also for this reason, English appears to be more frequently used than German if we focus on patent applications rather than patent granted.

In sum, figures in Tables 4 and 5 show that European patent applications tend to be more multilingual than is commonly believed. In addition, a comparison between Tables 3 and 4 show that the use of languages do not necessarily reflect the share of patent granted to residents in EPC contracting states. The overrepresentation of English, for example, can be partially be explained by language policy-related factors, that is, the restriction of the number of official languages of the EPO to three. Hence, a rethinking of the EPO's language regime could be supported precisely by users belonging to those language groups that are currently disadvantaged by the current system with respect to comparable competitors. For example, considering the shares of European patents granted to EPC patentees presented in Table 3 especially those in the second column, one can wonder whether Dutch-, Italian- and possibly Swedish-speaking users (and funders<sup>22</sup>) of the

<sup>22</sup> Patent offices are largely self-financing. The bulk of the EPO's revenue comes from procedural fees related to patent grant process and national renewal fees for granted patents (e.g. EPO 2010b: 33).

**Table 5** Languages in which European patents applications filed by European inventors have been filed

Language	1980–2010 (%)	2006–2010 (%)
German	43.7	37.7
English	35.4	45.5
French	14.0	11.0
Italian	2.9	2.9
Dutch	1.2	0.6
Swedish	1.0	0.3
Spanish	0.8	1.2
Others	0.9	0.8

Source Authors' calculations.  
EPO statistical database

services of the EPO would not have good reasons to expect the EPO to treat them on an equal footing with their European English-speaking competitors.<sup>23</sup>

However, the purpose of our comparative analysis is not to make the case for a reform of the EPO's language regime, as choices concerning the language policy are the object of political debate. Our goal is more modest, that is, providing an example of how the distributive consequences of alternative language policies can be characterised.

#### 4.3 Managing multilingual patent information

Published applications and existing patents are one of the most important sources of knowledge for new patents (Ceccagnoli et al. 2005: 62), and patent literature represents probably the widest, largely freely accessible, most-updated, comprehensive and well-classified collection of documents on new technologies. Generally speaking, users willing to access patent information but who do not understand the language(s) into which such data are available will have to bear translation costs or rely on multilingual staff or external firms able to monitor patents in various foreign languages. If the information cost is perceived as excessive, users are likely to either give up on information monitoring, which is vital in a highly competitive market, or choose to improvise their own search, often without the necessary multilingual proficiency, and in doing so they may face numerous risks: patent infringement, duplication of research efforts, incapability of detecting signals of change in the technology market.

Hence, the impact of information costs (mainly on Small and Medium Enterprises—SMEs) is such to influence innovation output and patent behaviour; for instance, difficulties in finding licensing partners to help develop and produce an invention may frustrate many innovation attempts. Also, barriers to a comprehensive patent search can reduce the quality of one's own applications. Therefore, ensuring a more equitable and easy access to patent information should be a priority

<sup>23</sup> Recall that Article 133 of the EPC (Chapter III Representation) states that “no person [having his residence or principal place of business in a Contracting state] shall be compelled to be represented by a professional representative in proceedings established by this Convention”. In other words, any European inventor (not necessarily fluent in one of the three official languages of the EPO) can file an application with the EPO without necessarily relying on patent attorneys capable of drafting applications in a foreign language.

in the context of the European patent system conceived to increase competitiveness of European businesses and strengthen the link between research and its industrial application. Further, access to patent information such as legal status data (ownership of rights, licensing agreements) is likely to increase transparency of the market and legal certainty of transactions of intangible assets. A facilitated access to patent information encourages successful IP strategies and patent filing, which, in turn, is likely to attract investors' attention and funds.

In this section, we briefly discuss how existing asymmetries in information costs generated by the current language regime of the EPO (scenario 1) and potential distributive effects at the level of "access to patent information" in scenarios 2 and 3 could be mitigated (one disadvantage of scenarios 2 and 3 with respect to scenario 1 is that the claims of European patents will no longer be available in the three official languages of the EPO. In terms of fairness, this implies that inventors who master one of the three current official languages of the EPO may no longer have full access to all claims of European patents when granted patents are published).

A possible strategy to reduce asymmetries in access to patent information is rationalising the European patent information system, for example, by gathering on one single portal all the multilingual information already available and making it readily accessible to users. Patent information is currently dispersed among the EPO and the various national patent offices which have very different levels of accessibility and digitalisation of patent information. A reform of the European patent information system should focus on four main aspects.

(1) Greater cooperation and communication between the EPO and national granting authorities is desirable. Thus, national patent offices should play a more prominent role in disseminating patent information, especially in the EPC countries where the official language is not English, French or German, since they possess original patent documents (or translation of them) in the national languages. Translations into admissible non-EPO languages of patents validated in EPC Contracting States can be accessed on *Espacenet* only through manual search, and the conditions of accessibility of such data may vary substantially from one office to the other; harmonisation and rationalisation of the patent information infrastructure is a major priority. Texts of European patent applications in their original admissible non-EPO language are made available in the *European Patent Register*, but only through manual search.

(2) More coordination could considerably reduce the partial increase in information costs borne by English-, French- and German-speaking inventors in scenarios 2 and 3, for the following reasons. First, Austria and Belgium have not yet ratified the London Agreement. This implies that they still require a full translation of patents into their national language(s) for the purposes of validation. Thus, in many cases, post-grant translations of claims into French and German may be available anyway. In addition, different countries that have accessed the LA such as Sweden or the Netherlands have prescribed a full translation into English if the patent has been granted in French or German. Second, several EPC Contracting States (including those that have ratified the LA) still demand a translation of the claims in one of their official languages to enforce provisional protection. Thus, access to translations of claims in English, French and German could be ensured

through a better coordination between the EPO and national patent offices. In addition, translations of claims are often already available a few months after the publication of a patent application, if the applicant seeks provisional protection in several European countries. The EPO could simply make available these translations on a central server, such as *Espacenet*. One could argue that the claims of a published patent application are not necessarily equal to the claims of the patent granted, as applicants can make substantial amendments during the substantive examination (so these translation would be for information purposes and should be avoided in freedom-to-operate analysis). We do not have data on how often and to what extent claims are amended during the examination phase, but it is unlikely that amended claims and the claims translated for the purposes of provisional protection always completely differ one from the other.

(3) Cross-lingual retrieval tools should be developed on patent databases which would allow users to carry out prior art search in their own language (Volpe 2011). The language of patents is well structured, but tends to combine the specific vocabulary of the domain to which patents apply with very generic terms and vague expressions in order to obfuscate the specifics of the invention and avoid narrowing the scope of protection. Consequently, a certain experience of patent specific designation is crucial for keyword searches. Furthermore, prior art disclosures are valid irrespective of the language used, which means that searches must be cross-lingual to be exhaustive. The World Intellectual Property Organisation (WIPO), for example, extended its *Patentscope* free search engine and in 2010 launched a beta version of the *cross-lingual information retrieval* (CLIR) for public testing. Any search query is translated at best by a statistical machine translation developed in-house at WIPO using *Moses* open-source technology and trained on patent abstracts and titles. CLIR provides quality search results by the means of search refining options on the technical domain relevant to the query. The user can select the relevant technical domain from a list and receive a number of synonyms and words associated with the query and translated into the target languages. It is worth noting that CLIR is trained with abstracts and titles, hence scenario 3 would suit the development of similar software for the EPO. As shown before, machine translation alone does not provide a reliable idea of the content of patents/claims and it does not solve the problem of the inability of users to search for patents by formulating queries in their own language. Hence, it does not completely solve the problem of information cost asymmetries. However, considering the increase in the quality of MT in the last decade, it can be very useful in cross-lingual retrieval. It should be noted that the use of classification systems of patent documents has probably lessen the role of keyword search. Notwithstanding, this strategy remains complementary to the use of classification codes in documents retrieval.

(4) It is necessary to increase awareness among all European SMEs about the strategic value of patent information. The EPO and national patent offices jointly created a network of patent information centres called *Patent Libraries* (PATLIB) with the goal of improving communication and cooperation between individual centres and promoting patent information awareness and support to local users. PATLIB work in the language of the country concerned and are familiar with the needs and conditions of the local economy. However, we believe this network should be more prominently

advertised among SMEs which often underestimate the value of patent information or lack the appropriate training to take due advantage of such data.

## 5 Concluding remarks and future research lines

In this article, we have identified different types of language-related costs that are linked to the management of multilingual communication in international patent organisations, focusing on the EPO. We have shown that translation and interpreting costs borne by applicants must be regarded as implicit costs of the language regime of the EPO that arise at different stages of the patenting procedures. More specifically, we have identified at least three channels through which a language regime can affect the relative implicit costs faced by decentralised agents who are characterised by different linguistic attributes, that is, “access to patenting procedures”, “access to patent information” and “power in negotiations and opposition procedures”. We have shown that the current language regime of the EPO has an effect on the distribution of implicit costs among European decentralised agents, thus raising the question of fairness.

We show that the current language regime of the EPO causes asymmetries to develop between the costs borne by English-, French- and German- speaking applicants on the one hand and costs borne by users whose first language is an admissible non-EPO language of the Office on the other hand. Cost asymmetry at the “access to patenting procedures” level can be estimated at 30 % at least. We explore two possible alternative language regimes. In both cases, we introduce a centralised system of financial compensation that covers translation costs borne by European applicants whose first language is not one of the official languages of the EPO. In the first alternative, financial compensation is covered by savings on current translation costs at the granting stage. In the second alternative, the number of official languages is increased to five and financial compensation is founded by an increase in filing fee and by partial savings on translation costs at the granting stage. Both alternatives could substantially reduce translation costs disparities among European applicants. In addition, we have shown that scenario 3 would also reduce the total costs of access to patenting procedures borne by all European applicants whose applications successfully pass the examination phase. This shows that a more multilingual language regime can be cheaper than a less multilingual regime for actors concerned, provided that language-related implicit costs are taken into account.

Finally, we discuss which EPC Contracting States could support a reform of the current language regime and we present some possible measures to rationalise the management of patent information that could reduce existing or potential disparities in the access to such information. Note that reducing asymmetries at the level of access to patenting procedures and access to patent information could contribute to decreasing disparities at the level of power in negotiations and opposition procedures, especially in scenario 3.

Let us conclude with a final remark on efficiency. In this article, we have focused on the distributive aspects of the language regime of the EPO, but efficiency is also a central dimension of policy evaluation. In the evaluation of language policies, efficiency is often

characterised as cost-effectiveness, that is, as the relationship between the costs of alternative policies and their outcomes or expected results (Gazzola and Grin 2007; Grin 2003). In order to assess the relative cost-effectiveness of alternative language regimes, we need to estimate for each of them the primary (and if possible secondary) costs and connect them with some indicators of effectiveness, for example, the number of European applications filed. As language regimes affect the relative implicit costs that applicants face to patent their inventions, a change in implicit costs could also have an effect on the number of applications filed. Although no estimate has been produced so far for the EPO, a few studies carried out in other countries show that a reduction of fees has a positive impact on the number of new applications (Van Pottelsberghe and Mejer 2010: 225; Van Pottelsberghe and Danguy 2009: 25). By analogy, a reduction in admission and interaction translation costs could also have a similar effect on the number of applications filed by European applicants whose first language is not English, French or German. For example, moving from scenario 1 to scenario 2 could entail an increase in the cost-effectiveness of the system. The primary costs of language regime 1 and 2 are the same. Hence, all other things being equal, the cost-effectiveness of language regime 2 would be at least as high as in scenario 1 if (i) a decrease in implicit costs entails an increase in the number of applications from European applicants whose first language is an admissible non-EPO language, and if (ii) this increase offsets the decrease (if any) in the number of applications filed by English-, French- or German-speakers due to the relative increase in information costs. In other words, alternative scenarios to the current language regime could be at the same time not only more balanced in terms of distribution of resources but also more cost-effective. Under certain conditions, also scenario 3 could be more cost-effective than the current language regime, i.e. if the decrease in implicit costs will generate an increase of applications (and thus fee income) sufficiently high to cover the corresponding increase in the primary costs of language regime 3, and to offset a decrease in the number of applications due to the increase in filing and searching fees. However, due to lack of precise data on the impact of languages regulations on the number of application filed, we leave this question to further research.

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