ECONOMIC COST-BENEFITS ANALYSIS OF

THE COMMUNITY PATENT

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ABSTRACT

This report is performed on behalf of the European Commission, DG Internal Market. The objective is to provide a detailed analysis of the economic benefits generated by the implementation of the Community patent (COMPAT) project. The COMPAT project has been on the negotiation table from before the creation of the European Patent Convention in 1973.

Based on recent research output on the economics of the European patent system and on new simulations, the present report provides detailed arguments supporting the implementation of the COMPAT project. By modeling the maintenance rate for the COMPAT with different hypothetical fee distribution keys, we simulate revenue to patent offices generated by different renewal fee scenarios. We compare these calculations with the current situation for European patents to show that the renewal fee income generated for the EPO and nearly all NPOs will exceed the renewal fees from the current system for a future COMPAT whose renewal fees correspond to existing costs for about 4 Member States. This therefore shows that the COMPAT would:

- Allow to have an efficient patent system with an 'acceptable' relative price;
- Correct several incongruities that currently reduce the perceived and actual effectiveness of the European patent system;
- Generate more renewal fees' income for the EPO and for all NPOs, or nearly all NPOs, depending on the adopted renewal fee schedule for the COMPAT.

The report is structured as follows.

1. Implications of a fragmented patent system in Europe
2. Simulations on the renewal fees' income under the COMPAT
3. Implications of the COMPAT on the relative cost of patenting
4. Success factors and recommendations

1. IMPLICATIONS OF A FRAGMENTED PATENT SYSTEM IN EUROPE

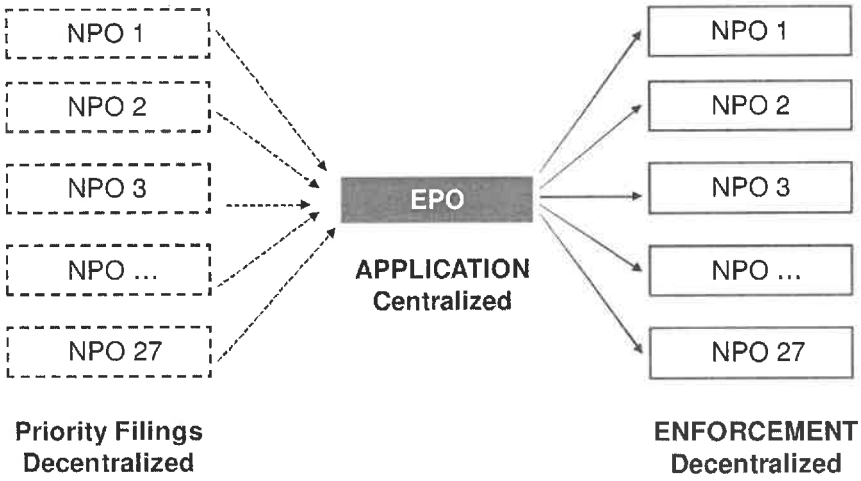
This chapter lists the economic benefits that can be expected from the COMPAT project. First, the European patent system is briefly described (section 1.1.), the cost consequences of its fragmented structure are presented in section 1.2.; and its consequences in terms of uncertainty and complexity are analyzed in section 1.3. The potential benefits of the COMPAT are summarized in section 1.4.

1.1. THE EUROPEAN PATENT SYSTEM AS OF APRIL 2009

The European patent system, from a "European Union" perspective, is actually a sum of 27 national patent systems. The only centralized aspect corresponds to the granting procedure, composed of performing search reports, ensuring publications, performing substantive examinations and processing oppositions, which are all performed by the European Patent Office (EPO). However, key dimensions are performed at the national level, including the filing of priority applications (before the submission at the EPO) and the enforcement (validations, translations, renewals, litigation) of patents after their grant by the EPO. This is illustrated in Fig. 1, which clearly shows the 'exclusive' role of national patent offices (NPOs) at the beginning and at the end of the process.

This is a simplified picture of the process, which in reality may be more complex, as various routes can be taken to be protected in European countries (cf. Guellec and van Pottelsberghe (2007) for a detailed description of the patenting process and the routes to Europe, especially Chapter 1 and Chapter 6). It must also be kept in mind that the EPO grants patents on behalf of 35 countries, of which 8 are not member of the European Union.

FIG. 1. A 'FRAGMENTED' EUROPEAN PATENT SYSTEM



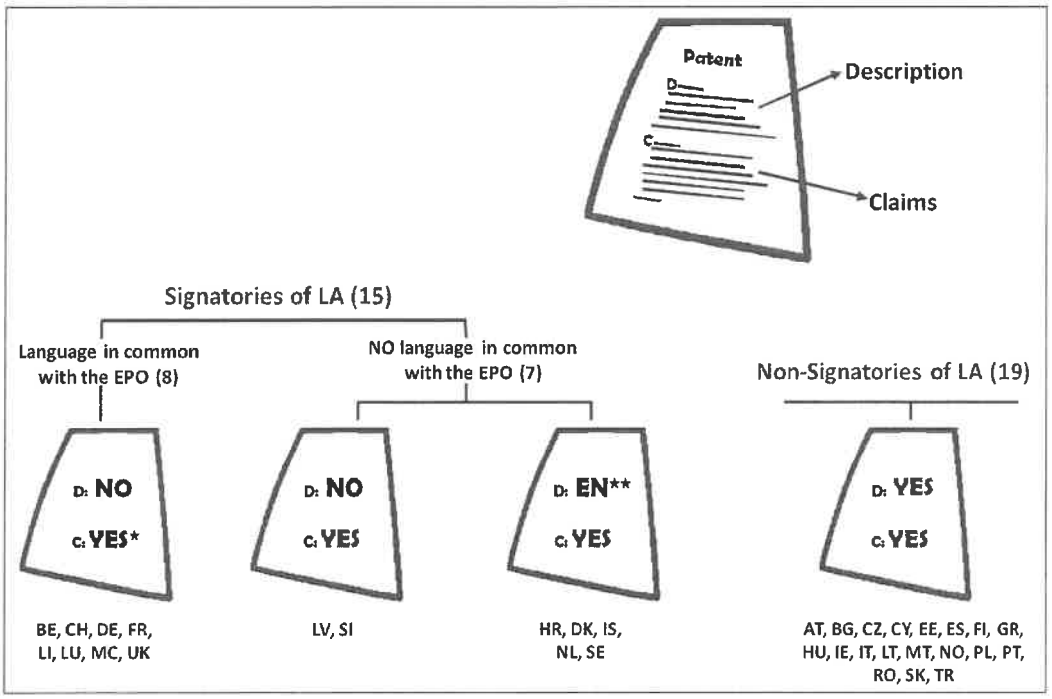
This fragmentation reduces the effectiveness (actual and perceived) of the European patent system. This is due to several factors that are the direct consequence of a fragmented system, and which do not occur in other large economies like Japan or the USA. The most important drawbacks of the European patent system are:

- Its prohibitive costs
- The economic incongruities induced by the fragmentation

1.2. PROHIBITIVE COSTS: AN INSIGHT FROM THE LONDON AGREEMENT

The prohibitive costs induced by the fragmented patent system have been analyzed through detailed simulations by van Pottelsberghe and François (2009) and van Pottelsberghe and Mejer (2008). The latter study focuses on the cost reductions induced by the London Agreement, which has entered into force in 14 countries so far. Fig. 2 illustrates the translation requirements after the London Agreement. It clearly shows that the major change concerns the reduced requirements for the translation of a patent's "description" section (generally the most lengthy part of the patent). The claims section, a shorter section on average, must still be translated in all languages.

FIG. 2. TRANSLATION REQUIREMENTS UNDER THE LONDON AGREEMENT

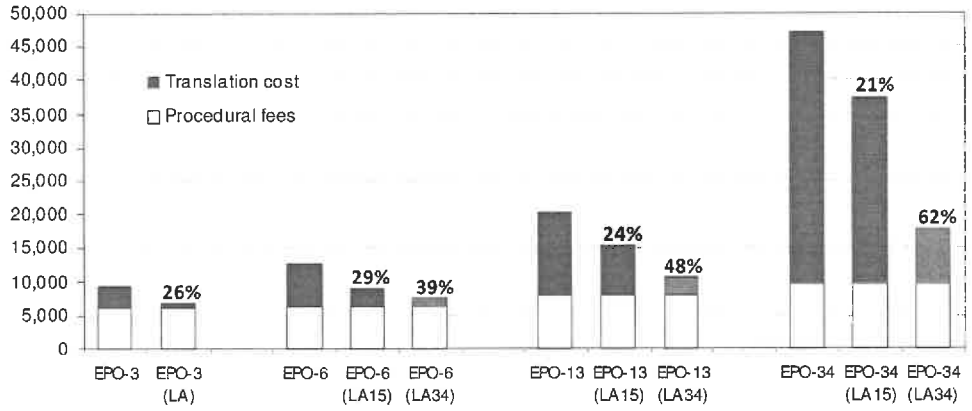


Source: van Pottelsberghe and Mejer (2008) – situation at 30 March 2009

Five countries have ratified the London Agreement but require translations of the description into English if this is not the language of proceedings. Two issues are worth noticing. First, from May 2008 onwards, a patent could be enforced in France with its description being available in German or English. The only section that would be available in French would be the claims section. Second, in case of litigation the owner of patent has to bear the cost of a full translation of the patent in the language of the country where the litigation takes place.

The cost consequences of the London Agreement are illustrated in Fig. 3 for several scenarios. The total cost of a patent is simulated according to its desired geographical scope of protection (i.e. in the three most frequently designated countries, six, 13 or all the 34 EPC member states). The costs are simulated before and after the London Agreement (LA15) if ratified by 15 countries; and for a potential ratification by the 34 member states (LA34). The white area represents the cumulated fees (filing, search, examination) and the dark area the translation costs. The cost savings induced by the London Agreement fluctuate between 25 and 30 per cent, which is substantial. However, would all countries ratify the London Agreement, one would see a more dramatic reduction in cumulated costs, of nearly 50 percent if 13 countries are targeted for protection to more than 60 percent if all countries are targeted for protection.

FIG. 3. THE LONDON AGREEMENT AND THE COST OF PATENTING IN EUROPE



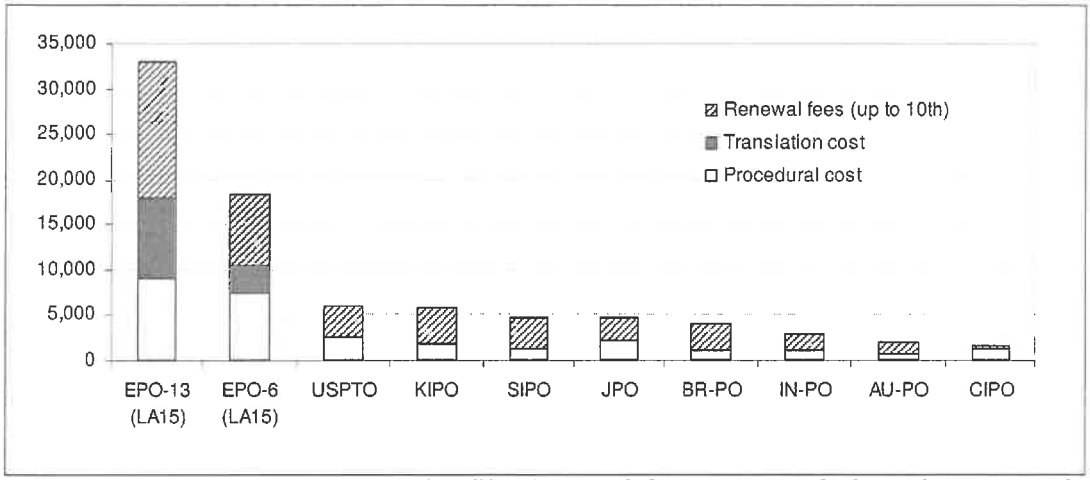
Note: EPO-3: DE, FR, UK - with more than 70% of the EP patents validated; EPO-6: DE, FR, UK, CH, IT, NL - more than 40%; EPO-13: DE, FR, UK, CH, IT, NL, AT, BE, ES, DK, FI, IE, SE - more than 12%; EPO-34: all the EPC contracting states as of May 2008. (LA15) represent the cost of patenting after the London Agreement ratified in May 2008; (LA34) represents the cost of patenting if all EPC member states would ratify the London Agreement.
Source: van Pottelsberghe and Mejer (2008)

The substantial cost savings induced by the London Agreement (30 percent drop when six countries are targeted) should not overshadow the still prohibitive costs of patenting in Europe, in both absolute and relative terms.

Fig. 4 presents the cumulated cost of patenting in nine patent offices of the important countries or regions in the world. The cumulated costs include filing and examination fees (white area), translation costs (dark areas) and renewal fees (grey areas). The fragmented system in Europe means that renewal fees must be paid in each national patent office in order to keep a patent in force. The cumulated costs are presented in US purchasing power parities to improve international comparability. The overwhelming costs of the European patent system are all too amply illustrated in Fig. 4. A patent enforced in 'only' six countries costs nearly four times more

than a patent filed in the rest of the world. If the patent is enforced in 13 countries, it would cost at least seven times more than anywhere else in the world. With the whole European (EPC) geographical area covered a patent would costs at least 15 times more than in the US.

FIG. 4. INTERNATIONAL COMPARISON OF PATENTING COSTS (US PPP)



Note: Cost structure including prosecuting fees (filing fees, search fees, examination fees), translation costs, and renewal fees for up to ten years of protection. Source: van Pottelsberghe and Mejer (2008)

These cumulated costs indubitably affect the demand for patenting and reduces the propensity of small and medium firms (SMEs) to rely on the patent system. The impact of cumulated fees on the propensity to patent has been estimated in several studies, which all reach the conclusion that the fee elasticity of patents is negative and significant, although smaller than one (about -0.4)[1]. This 'inelastic' feature means that the relative variation in the demand for patent is less than proportional than the relative variation in fees.

A graphical representation of the impact of relative fees is illustrated in Fig. 5. Relative fees provide a less biased international comparison of patent costs. It actually corrects for two potential biases: the market size and the patent size in terms of the number of claims. The first correction is required to compare geographical areas of different size. For instance, if a patent costs the same price in Japan and in the USA, applicants will perceive the US market as much cheaper, as the per capita cost will be nearly three times lower. The cost per capita provides a more accurate picture of the cost of a patent per market unit. The second correction is needed to account for the fact that in Japan patents are much smaller (and relatively more numerous) than in the USA in terms of the number of claims: the average patent filed at the JPO includes about 9 claims, against 24 in the USA[2]. The two corrections lead to the 3C-index put forward by van Pottelsberghe and François (2009): the cost per claim per capita.

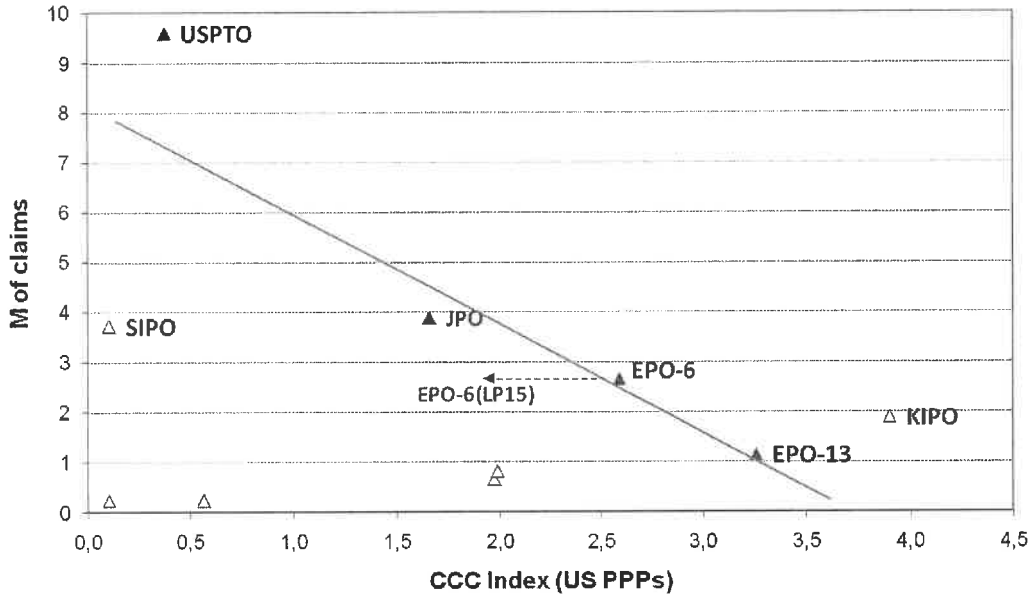
Fig. 5, which is taken from van Pottelsberghe and Mejer (2008) suggests that a traditional demand curve characterizes the relationship between relative prices (the cost per claim per

[1] Cf. de Rassenfosse and van Pottelsberghe (2007, 2008a) for cross country evidence on the impact of filing fees on the demand for priority applications; de Rassenfosse and van Pottelsberghe (2008b) provide time series evidence for the EPO, USPTO and JPO; Harhoff et al (2007, 2009) show that renewal fees, validation fees, and translation costs all affect the validation behavior of applicants.

[2] Cf. van Pottelsberghe and François (2009) for a methodological discussion related to the 3C-index.

capita) and the demand for patent protection, expressed in the millions of claims that filed in each patent office (the graph includes the patent offices where at least one million claims are filed per year). In short, the prohibitive costs of a European patent induce a much smaller demand for patent filed at the EPO. The USPTO is at the other opposite, with the cheapest patents within the most developed economies and the highest demand for patent protection. The impact of the London Agreement is illustrated in Fig. 5, for a patent that is protected in 'only' six European countries (the most frequently targeted economies). It clearly illustrates that the London Agreement has a substantial impact, which is however not enough to reduce the prohibitive cost of patenting in Europe.

FIG. 5. RELATIVE PATENTING COSTS AND THE DEMAND FOR PATENTS



Note: * The x axis shows cost per claim per million capita, expressed in US PPPs 2006, and includes process and translation costs. The y-axis shows the total number of claims filled in 2006 in each patent office. The line indicates the trend between three main regional offices: EPO, JPO and USPTO.
Source: van Pottelsberghe and Mejer, 2008

If a patent is still at least four times more expensive in Europe than in the USA, it must be kept in mind that the prohibitive patenting costs are only one aspect of the consequences of having a fragmented market for technology. More dramatic, although less 'tangible', consequences are analyzed in the next section.

1.3. INCONGRUTIES DUE TO A FRAGMENTED SYSTEM

The consequences of the fragmented system illustrated in Fig. 1 are the high uncertainty in terms of litigation and the managerial complexity induced by very heterogeneous national

enforcement systems. The following subsection (A) concerns the litigation costs and practices and subsection B focuses on the managerial complexity induced by three important economic 'incongruities'.

A. UNCERTAINTY: LITIGATION COSTS AND OUTCOMES

The high uncertainty induced by the fragmented patent system, in case of litigation, is due to the possibility of having different outcomes across countries. Patent validity can be challenged independently at both the European and national level. What makes the opposition process at the EPO especially attractive for the opponents is that the decision on European patent validity is effective in all the states where the European patent is to be enforced. A decision to uphold a European patent leaves the way open for further validity challenges before national courts. The decision taken by the national court is binding within the borders of the state where the litigation took place.

It is relatively affordable to file an opposition before the EPO, as the cost varies between €6000 and €50,000 (including patent lawyers' fees). However, in case of multiple litigations across national jurisdictions, the costs must be cumulated over the number of countries where the litigation is initiated. The EPO (WPL/4/03) provides an estimation of the cost of patent litigation in the four EPC contracting states (Germany, France, the Netherlands and United Kingdom) where 90% of patent litigations in Europe currently take place. Mejer and van Pottelsberghe (2009) present a comparative analysis of litigation costs.

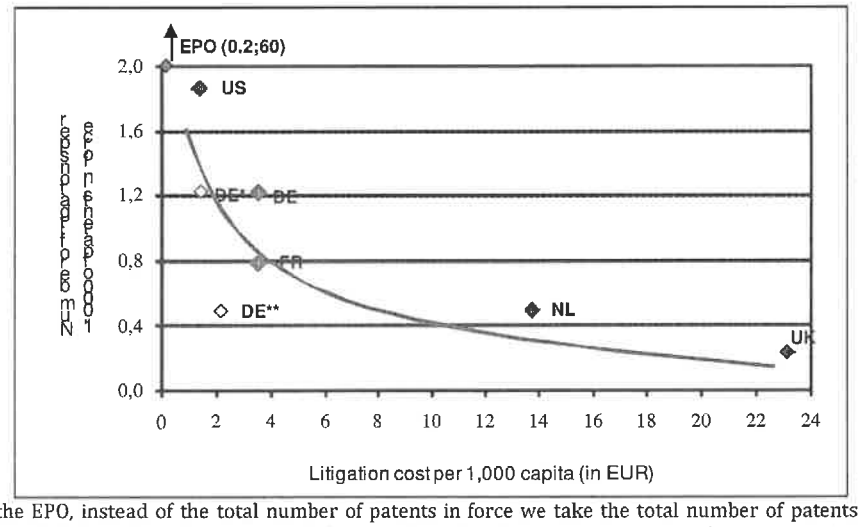
Litigation costs vary significantly across jurisdictions. The United Kingdom is the most expensive jurisdiction among EPC member states. The cost is much higher than in the three other jurisdictions, and is nearly as high as their cumulated costs. The litigation costs in Germany, France and the Netherlands are similar. However, in case of multiple litigations, costs vary from €310,000 before the four tribunals of first instance up to €3.6 million when accounting for the cost of appeal at second instance.

The cost of multiple litigations is highly prohibitive in Europe, especially for individuals and small and medium-sized firms, and can be twice as high as in the United States. The consequence of heterogeneous litigation costs and practices is illustrated in Fig. 6. It displays the position of five countries along two dimensions: the average cost of litigation per thousand capita on the horizontal axis and the share of litigation in the total number of patents enforced in the country on the vertical axis. In the US, the relatively large market reduces to some extent the prohibitive costs associated with patent litigations, hence the relatively high litigation rate. At the opposite end of the scale is the United Kingdom, with the highest litigation costs per capita and the smallest litigation rate.

The jurisdictions differ not only in terms of proceeding costs but also in terms of institutional design and legal practices (i.e. procedural law, speed of proceedings, damage assessment or quality of adjunctions). Mejer and van Pottelsberghe (2009) provide detailed comparisons of the heterogeneous legal practices in the four European countries. What matters here is to endorse the fact that there are strong variations across countries in litigation costs and litigation practices, which influence both the probability of a litigation and the outcome of this litigation. In addition, the multiplicity of small European markets (as compared to the US) actually exacerbates the prohibitive costs of managing and enforcing patents in Europe, especially in case of multiple parallel litigations.

The consequence of these very high cumulated litigation costs (in case of parallel litigations) and uncertain outcomes is the perception by applicants of a high degree of uncertainty. For the SMEs who gauge the system, the European patent system is indubitably much less attractive than the US one, and its perceived effectiveness is probably very low.

FIG. 6. LITIGATION DEMAND CURVE – SMALL MARKET VALUE PATENTS, 2004



Note: For the EPO, instead of the total number of patents in force we take the total number of patents granted in 2004. We assume that on average 6% of granted patents are subject to an opposition). European patents are on average effectively validated in 6 countries therefore, population size for the EPO is assumed to be the sum of the population is these countries. In Germany the courts hearing infringement and validity cases are separated. DE* point presents the data for infringement cases in Germany and DE** for nullity cases. The litigation cost is calculated as the average total cost of both 1st and 2nd Instance proceedings. Source: Mejer and van Pottelsberghe (2009)

B. MANAGERIAL COMPLEXITY: 3 INCONGRUITIES

Beyond the prohibitive costs of getting patent protection in Europe, and beyond the high uncertainty induced by heterogeneous litigation costs and practices, innovators actually face three types of incongruities. These incongruities are presented and illustrated through several case studies in Mejer and van Pottelsberghe (2009). They can be summarized as follows.

EU-wide competition policy and national patents: There is therefore an inconsistency within the European Union: its competition policy authority has a reach over the whole European market and the countervailing leverage provided by intellectual property policy is ultimately run at the national level in each of the 27 states. In effect, national authorities may invalidate a patent centrally granted by the EPO, and a national application may actually be granted independently from the EPO.

Unfair intra-EU 'parallel' trade: The principle of free movement of goods in the EU makes it relatively easy for imitators, infringers or parallel importers to enter the European Union through a country where the patent has not been enforced, and then distribute it widely within Europe including the countries where the patent is enforced. This of course does not preclude enforcing the patent in the countries where it has been effectively validated, but makes it more

difficult to block the entry into the Single Market of products violating patent rights. In spite of the Enforcement Directive 2004/48/EC to provide a minimum level of remedies, once the alleged infringer is identified in one of the national markets, the patent holder must rely on the legal procedures of this particular state in a national court to enforce his rights to obtain injunctions, seizure orders, and other judicial remedies.

Time paradox: The current institutional setting within the EU allows for time inconsistencies in the treatment and enforcement of patents. Within nine months of the decision to grant by the EPO, third parties can file an opposition against the patent. The EPO decision on an opposition case is supposed to apply in all the countries where the patent is effectively enforced. However, the EPC allows third parties to challenge the validity of a patent under the legal rules of the countries in which the patent has been effectively validated. Such an action for nullity can be made directly from the date of validation in a national patent office, even if there is still an opposition pending at the EPO. As it takes on average three years for the EPO to tackle an opposition case it is possible to be accused of infringement and pay damages or even endure permanent injunction at national level while the patent is later declared invalid by the EPO.

These incongruities constitute a real barrier to accessing the patent system in Europe by SMEs and universities, and hence to their possibilities to operate across national borders within the Single Market.

1.4. IN A NUTSHELL

It turns out from the previous sections that the creation of a community patent would be highly beneficial for the European economy, especially through the following channels:

So far a patent in Europe is at least four times more expensive than in any other country, in both absolute and relative terms. With renewal fees and translation costs that increase linearly with the geographical scope for protection a patent targeting a large number of countries can be up to 15 times more expensive than a US patent.

- The COMPAT would induce a sharp reduction of the relative and absolute cost of patenting in Europe. This is due to the large geographical area covered by the EU27. If a single fee structure could be used, the cost per capita (or per market unit) would be much smaller than today.

The current system induces a high level of uncertainty, due to potential 'patent validity challenges' in all the countries target for the protection of a European patent. In case of parallel litigations, the risk is associated with relatively high litigation costs (higher than in the US in relative terms)

- The COMPAT would only be challenged through a centralized system (either oppositions at the EPO or validity challenges before a centralized court system) that should be

created. This centralized process would drastically improve the perceived effectiveness of the European patent system

The currently fragmented system induces three economic incongruities (EU competition authority vs national practices; intra-EU parallel imports, and time incongruities) that induce a high level of complexity, as patent holders must put in place a country specific management process of their patents.

- The COMPAT would suppress these three economic incongruities and contribute to create an effective market for technology in Europe. This argument mainly concerns the perception that European and non European applicants would have of the European patent system. The latter would contribute to create the largest market for technology in the world (in terms of high quality patents).

The current system, and its high costs, generates for national patent offices renewal fee incomes that are substantial

- The COMPAT system could actually generate more resources than the current system, while being more accessible to the applicant. This is investigated in the following section.

2. SIMULATIONS OF FEES' INCOME UNDER THE COMPAT

An important issue that is frequently tackled during the discussions on the COMPAT project concerns the renewal fees' income: national patent offices (NPOs) wonder whether the COMPAT would actually reduce their income related to renewal fees. The EPO's income is also an issue at stake, since about 25 to 30 percent of its budget is composed of half the renewal fees income generated by NPOs. This 'income' issue is legitimate and deserves a careful analysis.

True, NPOs would have to 'share' the revenue generated by a centralized COMPAT. And this 'share' might be smaller than the amounts collected as 'independent offices'. But the total revenue generated by the COMPAT could be far bigger than what they generate locally. Whether this 'shared' revenue would be larger or smaller than the local revenue generated by the traditional European patent is an issue that can be analyzed with simulations.

The answer is however not straightforward, as the total renewal fees income generated by granted patents depends on three broad factors:

1) the renewal fee structure of the COMPAT (what level of fees? It is clear that with very high fees there would be a relatively small use of it, and *vice versa*);

2) the maintenance rate over time (which also depends on the level of fees and on whether the system would allow to switch towards a European patent, where applicant would simply enforce their patents in a limited number of NPOs);

3) the distribution key (how would the total renewal fees' income generated by the COMPAT would be shared between NPOs?).

This second chapter aims at performing the simulations. The following section describes the methodological approach and the working hypotheses. Section 2.2 presents the total revenue generated by a current European patent. The extent to which several factors affect the maintenance rate in a patent office is estimated in section 2.3. From these estimates it is possible to simulate the maintenance rate with the COMPAT system. Section 2.4 first simulates the total revenues generated by the (current) European patent system and the revenue generated by the COMPAT system. Three different types of distribution keys are then used to assess the renewal fees' income that would be transferred to the NPOs.

2.1. METHODOLOGICAL APPROACH

The approach adopted to simulate the impact of the COMPAT on the renewal fees income of each NPO and of the EPO is composed of **five main stages**:

1. Compute the renewal fees income generated by a current 'average' European patent.
2. Understand the factors that influence the maintenance rate of patents in all NPOs
3. From the results of (2), simulate the maintenance rate of the COMPAT
4. From (3), compute the renewal fees' income generated by the COMPAT
5. From (4) and from various "distribution keys", compute NPOs income

The focus is first put on the cumulated renewal fees' income generated by one patent over its entire life span (this fee income depends on the number of countries it has been validated and enforced and on the duration of the patent in each of these countries). This allows us to assess the total renewal fees' income generated by all the NPOs of the EU27 member states and of the EPO. In other words, we measure how much income is generated by one patent "on average" over its entire lifecycle.

An important **working hypothesis** must be set (and accepted by key stakeholders) before entering into the analysis. It is fairly acceptable and allow to reduce the number of alternative methodological choices. The hypothesis of **"run-in-period"** suggests that the renewal fees' income simulations are run "at equilibrium". The early changes in patenting behavior, and the required adaptation time to the new system are therefore not accounted for. This hypothesis is equivalent to the practice that consists in considering the long run equilibrium.

The simulations are also **performed "at the patent level"** to make the conclusions independent from the relative substitution between the European patent and the COMPAT. Questions such as *"what will be the share of patents granted by the EPO that follow the COMPAT route?"* would not affect the results. This question would actually influence the total revenues of NPOs, which are simulated at the end of this chapter. Graphical illustrations for each NPO are presented in the appendix.

A **second working hypothesis** is that any patent starts to generate renewal fees income for NPOs **from its 6th year onwards** (up to its 20th year, depending on the maintenance rate). Before that, it is considered as a 'pending' application at the EPO. This hypothesis corresponds to the observed average delay before the decision to grant a patent at the EPO.

The **third working hypothesis** is the irreversibility choice that must be made by the applicant. If an applicant opts for the COMPAT structure **it should not be possible to later switch towards the current European patent system**, and *vice versa*. Allowing such a system would simply induce a high complexity in both the simulation exercise and the tracking of what is actually going on in Europe.

These hypotheses and methodological choice (at the patent level) aims at assessing whether a community patent (COMPAT) will generate more or less revenues than a current European patent (EP) over its entire life span. Whatever the substitution degree between these two patents is, an actor (national patent office or the EPO) will be better off if the revenue it gets from one COMPAT is higher than what he gets from one EP.

2.2. HOW MUCH RENEWAL FEES DOES ONE PATENT GENERATE?

The renewal fees' income generated by a European patent depends on three main factors:

- The validation rate: the probability that it is validated in a country *i* ;
- The maintenance rate: the probability that it is maintained each year *t* for 20 years ;
- The level of renewal fees.

Equation (1) shows the total renewal fees' income ($VNPO_i$) generated by the average European patent for a national patent office *i* :

$$VNPO_i = \sum_{t=6}^{20} \pi_i \, (1 - \delta_{it}) F_{it} \qquad (1)$$

Where: π_i = The share of patents granted by the EPO which validated in country *i*

δ_{it} = The drop (or depreciation) rate of the average patent in country *i* and year *t*

F_{it} = The renewal fees in country *i* and year *t*

According to equation (1), the value of an average European patent for country *i* is the sum from year 6 to year 20 (the average validation period) of the product of the validation rate (or validation probability), the maintenance rate (1-δ) and the level of the renewal fees. This amount could divided by 2, because one half of the revenue generated by an NPO is going to the EPO and the other half is for the NPO itself (this 50/50 split will be accounted for in individual NPOs revenue simulations). Year 6 of the patent is taken into account for the start of the renewal fees' income computation.

Summing the cumulated renewal fees' income generated in the 27 member states of the European Union, as in equation (2), gives the total income "*VNPO*" generated by an average patent over its life in the European Union's national patent offices (and for the EPO).

$$VNPO = \sum_{i=1}^{27} VNPO_i \qquad (2)$$

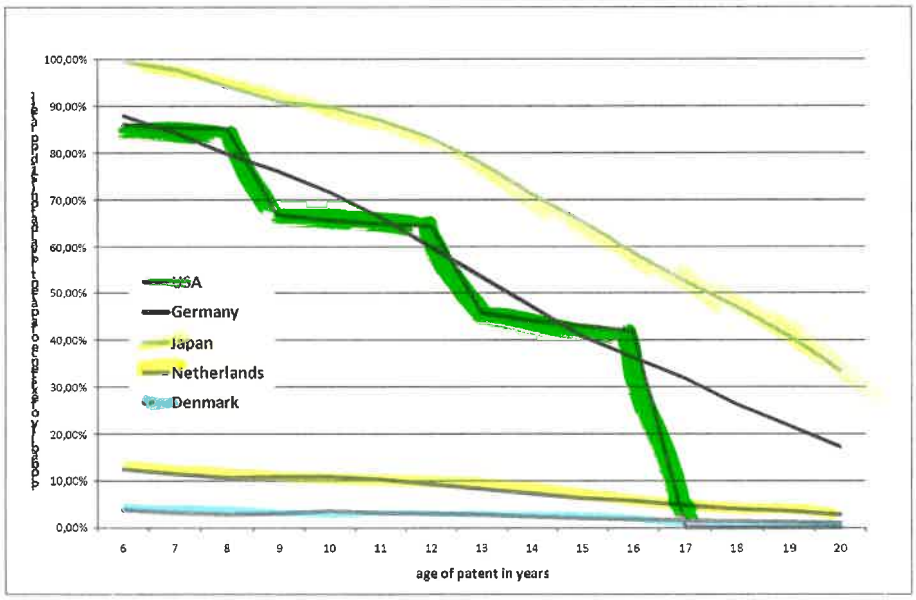
The value of a patent under the COMPAT can therefore be measured with a similar formulae, with the exception that it is, by definition, associated with a validation rate equal to 100% (the COMPAT only has one 'validation' possibility, otherwise it is not a 'COMPAT'). The value (*VCOM*) generated by an average patent under the COMPAT is presented in equation (3).

$$VCOM = \sum_{c=6}^{20} [\pi_c (1 - \delta_{Cc}])F_{Cc} \qquad (3)$$

The important parameters are therefore the maintenance rate of the COMPAT ($1-\delta_c$) and the structure of its renewal fees. These two parameters (maintenance rate and renewal fees) are correlated. Very high fees would obviously reduce the maintenance rate (or increase the drop-out rate), and vice versa.

Fig. 7 illustrates the differences observed across countries in patent validation/maintenance rates, and their evolution over time. Japan, with a large homogenous economy and relatively low renewal fees has the highest maintenance rate all along the life span of a patent. Within Europe, Germany, by far the largest European country, has a high validation/maintenance rate, similar to the US or Japanese one. After six years, 85 per cent of the patents granted by the EPO are enforced in Germany. This rate falls to 18 per cent for the patents aged 20 year. Denmark, a smaller country, has a much smaller validation rate, about 5 per cent of the granted patents, which falls to about 1 per cent after 20 years. The maintenance rate for the US is dented because renewal fees must only be paid at three different stages in the life of a patent, confirming somewhat the important role played by renewal fees. From Fig. 7 it is important to bear in mind that strong variations in maintenance rates are observed across countries, and that the maintenance rate drops over time.

FIG. 7. MAINTENANCE RATE OF PATENTS IN SELECTED COUNTRIES



Source: own calculation from data submitted by the EPO

2.3. THE MAINTENANCE RATE UNDER THE COMPAT

The maintenance rates presented in Fig 7 are a key factor for the calculation of the total revenue generated by one patent (for a given NPO or for Europe as a whole). Therefore, in order to simulate the revenue generated by an average patent under the COMPAT, the factors that affect this maintenance rate must be understood and measured.

Having a rich dataset on the maintenance rates in numerous European national patent offices and for the USA and Japan, several econometric models have been run to estimate the impact of each factor on the maintenance rate of a patent. The following model is estimated:

$$(1-\delta_{it}) = C + \beta \cdot GDP + \theta \cdot NPOAGE_t + \gamma \cdot IPI_{ti} + \sigma \cdot PATAGE_t + \alpha \cdot F_{it} + \varepsilon_{it} \quad (4)$$

The dependent variable corresponds to the maintenance rate of granted patents ($1-\delta$), or one minus the drop-out rate) enforced in country i at year t (t=6,..., 20). 15 years of renewals are therefore taken into account for each country. The country-level explanatory variables include the **gross domestic product** (*GDP*) of the year 2006, expressed in €; an indicator of the **strength of the national patent system** (*IPI*, which has been calculated by Ginarte and Park (1997)); and the **age of membership in the EPC** (*NPOAGE*, going up to a maximum of 30 years for the founding members). This latter variable aims at testing whether the countries that have been part the EPC for a longer period also have higher maintenance rates. The **age of a patent** (*PATAGE*) is a variable that is constant across countries but varies over time to capture the life cycle of the patented technology. It is expected that the older a patent (hence the technology) is, the lower is its maintenance rate. Finally, one variable varies across countries and over the life cycle of a patent: the **renewal fees** (*F*). They are expected to have a negative impact on the maintenance rate.

The structure of this empirical model is based on several existing studies that aim at understanding the filing behavior of applicants. The factors affecting the demand for patents have been analyzed by de Rassenfosse and van Pottelsberghe (2007, 2008, 2009); those influencing the validation behavior once the patent is granted by the EPO have been analyzed by Harhoff et al. (2007, 2009).

The econometric results are presented in Table 1. Several estimates have been performed with 15 or 21 EU member states (the countries for which the data was available over the studied period, and more recent countries but with sufficient – and stable- observations), with or without the USA and Japan. The results were very stable, and similar to the ones presented in Table 1, which are based on the estimates run with the 15 oldest European Member States, Japan and the United States. They can be interpreted as follows.

TABLE 1. ESTIMATED PARAMETERS OF THE "MAINTENANCE RATE" MODEL

Variable	Paramater Estimate	Standard error	t-value	Pr > |t|
Intercept	0,365	0,068	5,30	<,0001
GDP ('000 billion €)	0,080	0,006	13,53	<,0001
Fees ('000 €)	-0,084	0,029	-2,93	0,0037
Age of the patent	-0,030	0,002	-14,83	<,0001
Age of membership	0,005	0,001	4,83	<,0001
Intellectual Property Index	0,052	0,016	3,34	0,001
R-Square	80,2%			
Adjusted R-Square	79,8%			
Number of observations	243			

Source: cf. main text. The parameters are estimated with an heteroscedastic consistent estimator, over 17 countries and 20 years (unbalanced panel). The dependent variable is the maintenance rate, GDP stands for GDP; Fees stands for the national annual renewal fees; Age of membership corresponds to the country's date of signature for the EPC membership, Intellectual property index comes from Ginate and Park (1997)'s updated results for 20à5.

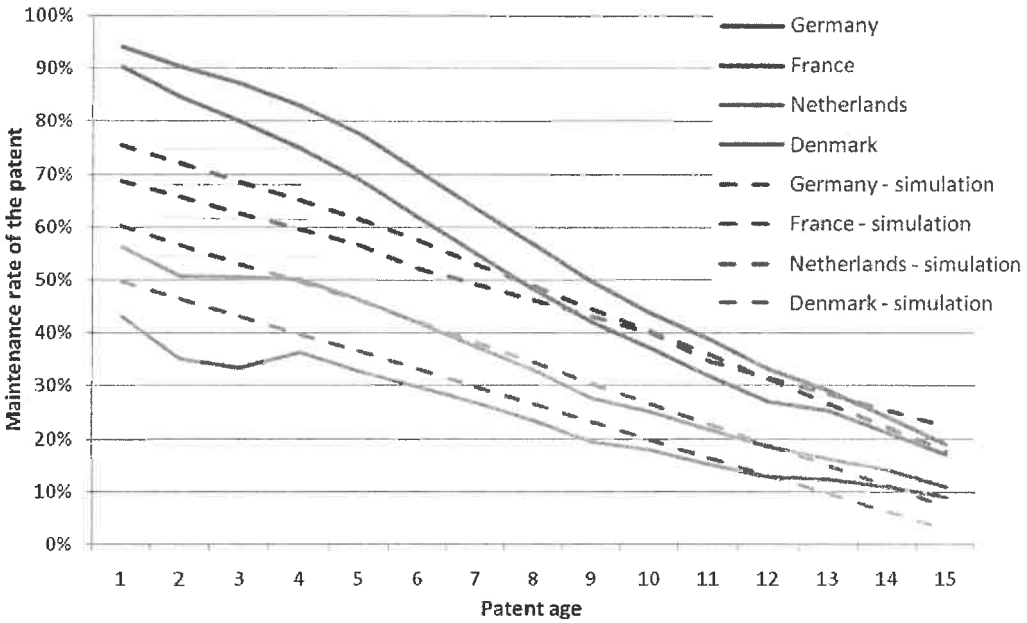
First, GDP, which reflect the market attractiveness or the wealth of a country has a positive and highly significant impact on the maintenance rate. The countries with a higher GDP enjoy a high maintenance rate. Looking at the t-stat, which indicates the level of significance of the variable, one may conclude that GDP is amongst the most important factors that influences the maintenance rate in a country. The second variable that plays a highly significant role is related to the age of the patent. Its level of significance is as high as the level of significance of the GDP variable (they both have T-stat above 13). The older a patent is, the lower its maintenance rate in a country. This is true for all countries and follows the natural life cycle of a patented technology.

Then comes a country's age of EPC membership. The estimated parameter suggests that the longer the EPC membership, the higher the maintenance rate of a patent. This is the illustration of an adaptation phase to an advanced European system. The Intellectual Property Index also plays a positive and significant impact, suggesting that the countries with a stronger patent system (in terms of subject matter, enforcement quality, and reliability) will logically see higher maintenance rates than the countries with weaker patent systems.

Finally, renewal fees have a significant downward impact on the maintenance rate of patents granted by the EPO in a given country. The higher the renewal fees, the lower are the maintenance rates in a country. This variable is significant, but less than the patent life cycle and GDP variables.

According to the adjusted R-squared, the four variables explain 80 per cent of the variance in maintenance rates over time and across countries, which is a fairly good approximation. These estimated parameters have been used to 'fit' the maintenance rate of four countries. The results are depicted in Fig. 8. For the Netherlands and Denmark the maintenance rates are particularly well fitted. For larger countries like Germany or France the fitted maintenance rate is first lower than the actual value and then larger, when the patent gets older.

FIG. 8. ACTUAL AND FITTED MAINTENANCE RATES IN SELECTED COUNTRIES



Source: own calculation, from raw datat provided by the EPO. The fitted (or simulated) maintenance rates are performed with the estimated parameters of equation (4), which are presented in Table 1. The age of a patent actually starts from the year 6 in a patent age.

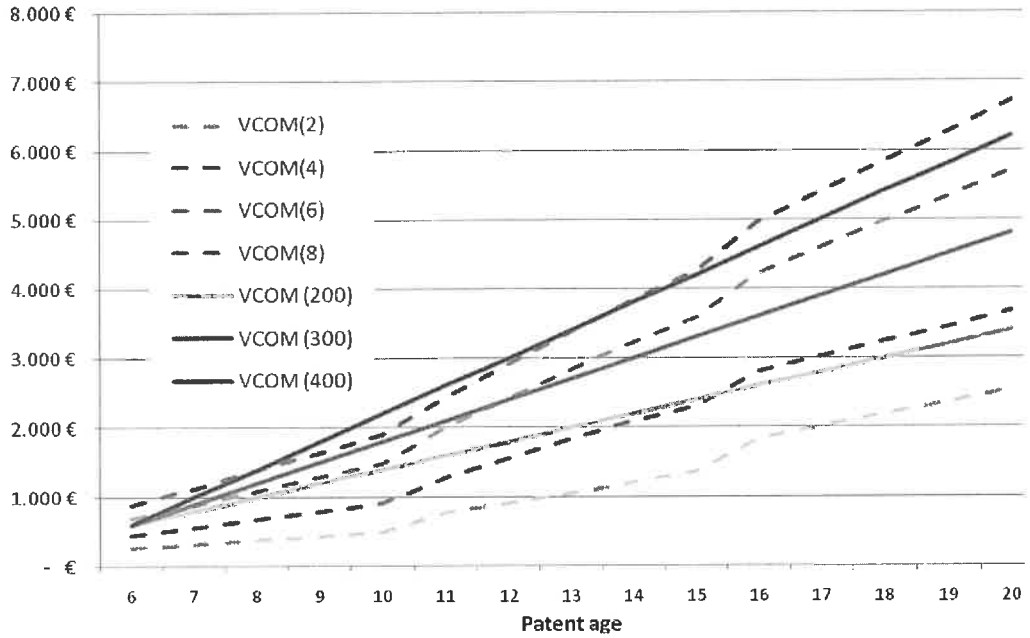
With the estimated parameters presented in Table 1 it is now possible to simulate a maintenance rate for the future COMPAT. The GDP of the EU27 economic area is straightforward to compute, the patent age is available as such, and the age of membership is supposed to be of 0 year (i.e. no experience, because it is a new system). It could be argued that an age of 30 years could be taken into account, because the early members for a large economic area within the EU27. However this assumption would not change substantially the simulation, and we opted for a conservative methodology (the only risk is to underestimate the revenues). The only variable that might vary substantially, and is subject to a 'political' negotiation, is the renewal fees variable.

Two types of renewal fees were considered. The first one corresponds to the sum of the renewals fee of the 2, 4, 6 or 8 countries that are the most frequently designated under the current European patent system. They are respectively called VCOM(2), VCOM(4), VCOM(6) and VCOM(8). These fee structures consist in adding the current fees of countries that have different policies. It could be argued that the simple sum should be taken, or that the median fees should be first calculated and then multiplied by the number of countries accounted for These fee structure were proposed in the European Council working document (EC, 2008) made available by the European Commission Services (DG Internal Market).

We took the freedom to put forward a simpler fees schedule. This second structure is composed of a starting fee of €600 on year 6 of the patent age and then a constant (and fix) increment of €200, €300 or €400 each additional year in the patent age. These fee schedules are called VCOM(200), VCOM(300) and VCOM(400), respectively. The proposed VCOM(200) is actually close to the sum of the renewal fees currently proposed by four countries, or VCOM(4). With a VCOM(200) renewal fees schedule, the applicant would pay a fee of about €3300 to keep a

patent enforced for its 20th year. With the VCOM(300) the amount is close to €5000, and with the VCOM(400) it is more than €6000.

FIG. 9. POSSIBLE FEE STRUCTURES FOR THE COMPAT

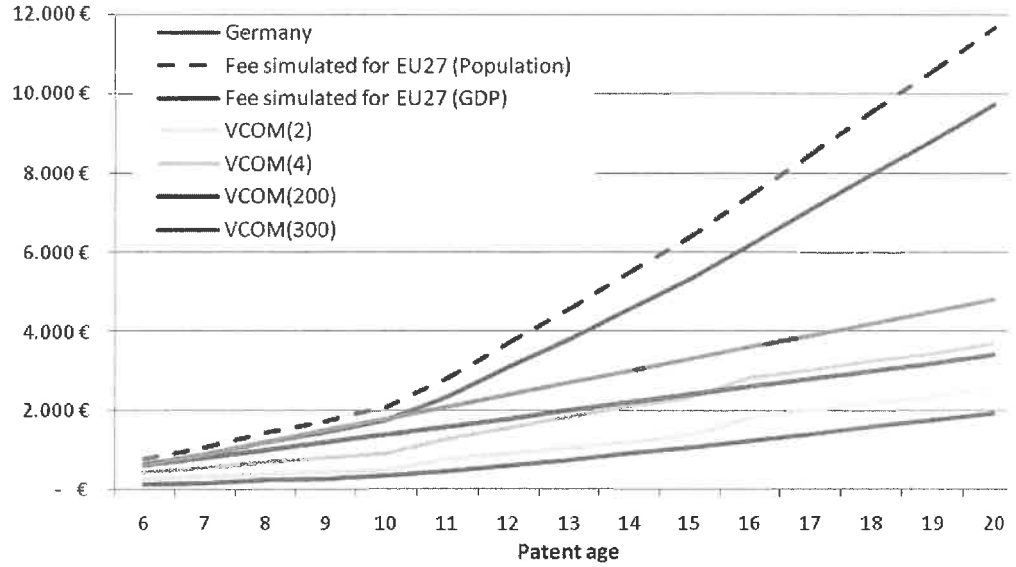


Note: VCOM(2), VCOM(4) , VCOM(6) and VCOM(8) correspond to the sum of the renewal fee structure of 2, 4, 6 and 8 countries, respectively. VCOM(200), VCOM(300) and VCOM(400) characterize a fee structure that would start at €600 at year 6 and then add each year €200, €300, and €400, respectively.

How would these COMPAT renewal fee schedules compare with current fees? The answer must include two dimensions of a fee structure, its absolute value and its relative position. Indeed, a renewal fee might be twice as high in country A than in country B, but if the former is four times larger than in the latter (i.e., with a much larger market potential), the relative fee is actually cheaper in country A than in country B. This relative vs absolute comparison has already been illustrated in Fig. 4 and in Fig. 5 for total cumulated fees. For instance, if the COMPAT would apply the 'relative' fee structure of the German patent office to the whole EU economic area, the renewal fees would be much higher. This is illustrated in Fig. 10 (taking into account the population or the GDP as indicator of market size).

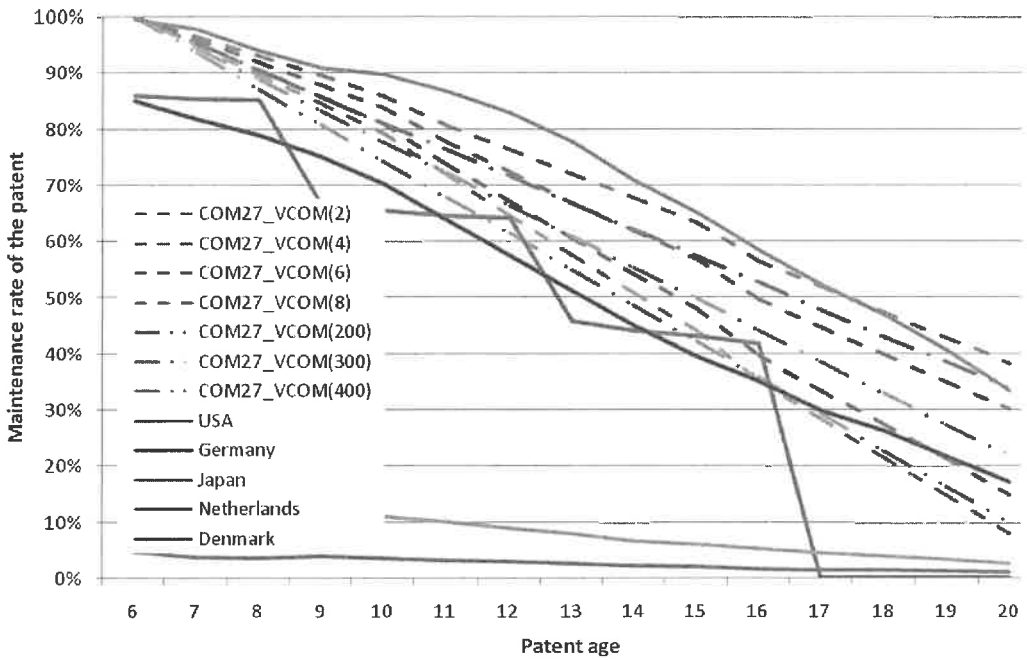
The German fees start very low and end up at about €2000 at the end of the patent life cycle. If the same 'relative' fee (ie, same fee per capita or fee per GDP) is applied for the COMPAT, the renewal fee schedule would be quite prohibitive and reach €10,000 to €12,000 for the 20th year. The renewal fee structure proposed with the VCOM(300) solution would ends under €5000, which is more affordable, but still more than twice as high as the absolute fee in Germany for the 20th year of the patent. Keeping in mind that the whole economic area covered by the COMPAT would be more than six time larger than the one currently covered by Germany, a VCOM(200) or VCOM(300) solution seems acceptable and corresponds to a good compromise between an absolute and a relative fee schedule.

FIG. 10. ABSOLUTE AND RELATIVE RENEWAL FEES WITH THE COMPAT



Note: VCOM(4) corresponds to the sum of the renewal fee structure of 4 countries, VCOM(300) characterizes a fee structure that would start at €600 at year 6 and then add each year €300. The simulated fees correspond to the level of fees of the COMPAT if the relative German fees would be applied to the EU, the weight being either the population or the GDP. Source: own calculation.

FIG. 11. SIMULATED MAINTENANCE RATE WITH THE COMPAT



Source: own calculation from data submitted by the EPO and the Trilateral statistical report for the US and Japan, and from the estimated parameters presented in Table 1.

The simulated maintenance rates under the COMPAT are pictured in Fig. 11. The maintenance rate varies according to the chosen renewal fee structure. Most simulations fluctuate around the Japanese maintenance rate, and are about twice as high as the German maintenance rate at the end of a patent life cycle. This high maintenance rate of the COMPAT is primarily due to the large geographical scope that would be covered by a single patent, which is about six times larger than the German economy. With the simulated 'maintenance rate' of the COMPAT it is now possible to calculate the renewal fee income that would be generated by an average patent under the COMPAT and compare it with the European patent. Lower renewal fees, like VCOM(200) would induce a relatively high maintenance rate.

2.4. RENEWAL FEES "INCOME" (TOTAL AND SHARED)

This section first presents the simulations of the total renewal fees' income generated by the COMPAT under different fee schedules. Various 'distribution keys' (of the renewal fees' income generated under the COMPAT towards national patent offices) are presented. The renewal fee income for each national patent office is then simulated according to the 'council proposal' distribution key and according to our preferred 'GDP' distribution key.

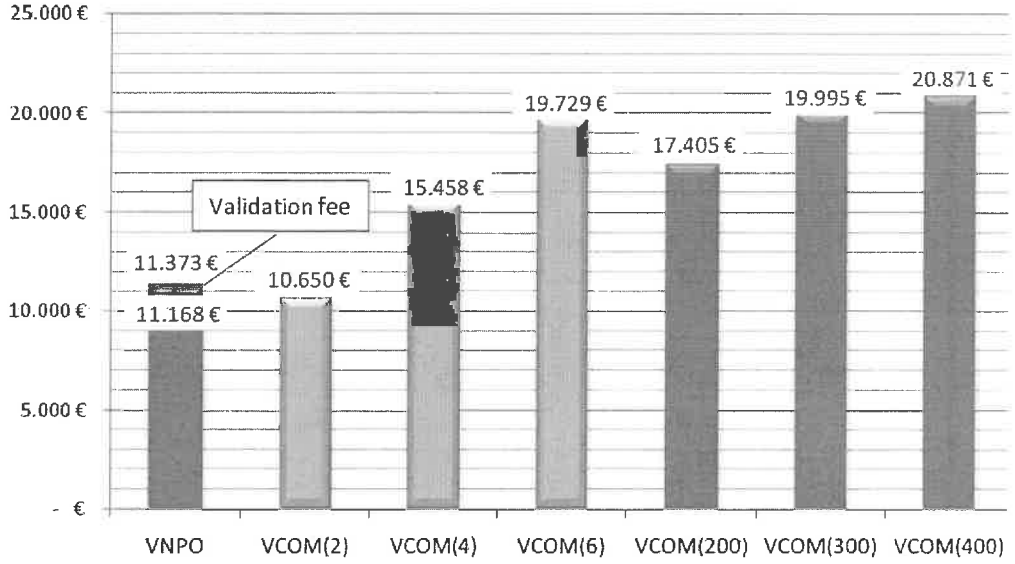
A. TOTAL RENEWAL FEES' INCOME UNDER THE EUROPEAN PATENT AND THE COMPAT

Fig. 12 presents the average total renewal fee income generated by one patent over its life time. The renewal fee income is calculated as in equation (2) and depends on the number of countries the patent is enforced in and on the number of years it is maintained in each of these countries. The higher the number of countries (amongst 27 possible countries within the EU) and the longer the maintenance of the patent (with a maximum of 20 years from the priority date), the higher will be the total amount of renewal fees' income generated by the patent. The first bar (in blue) presented in Fig. 12 corresponds to the actual fees income generated by the NPOs. A bit more than €11,000 is currently generated by the average EPO granted patent (if the maintenance rates observed over the past are stable over time, which seems to be the case).

The total renewal fees income generated by the COMPAT would obviously vary with the level of fees, as illustrated in equation (3). According to the estimated parameters presented in Table 1 (and hence the simulated maintenance rate of the COMPAT depicted in Fig. 11), the revenue generated by the COMPAT would vary from €10,000 with the VCOM(2) up to €19,000 with the VCOM(6) fee schedule. With the simpler fee schedule put forward in this report, it would vary from €17,000 (with the VCOM(200) fee schedule) up to €20,000 (with the VCOM(400) fee schedule).

In other words, the COMPAT would generate at least the same amount of cumulated fees' income than the current European patent. With our preferred VCOM(200) or VCOM(300) fee structure, the total income generated by one patent would be more than 150% higher than the current total income generated with the European patent. The same is true for the EPO income that is generated by renewal fees.

FIG. 12. SIMULATED TOTAL RENEWAL FEES' INCOME UNDER THE COMPAT



Source: own calculation from the estimated parameters presented in Table 1, and observed data on maintenance rates in national patent offices.

It is quite reassuring to reach the conclusion that the total renewal fees' income generated by a patent under the COMPAT could be substantially higher than the current total (across countries) renewal fees' income generated by each of the NPO. However, the key issue is to assess to what extent the COMPAT would actually affect each NPO's income. This obviously depends on the adopted distribution key between NPOs, which is tackled in the following subsection.

B. "THEORETICAL" WEIGHTING SCHEMES

Three distribution keys could be considered for the sharing of the total renewal fees' income generated under the COMPAT; they are presented in Table 2. **The actual distribution key** (which is the share of each NPO in the total income generated by all NPOs) would actually be an unfair distribution, because it is highly biased in favor of large countries, and especially Germany. Applicants gradually reduce the number of countries for enforcement, and when they keep the patent 'alive' it is generally in the largest countries. Germany is frequently the last country in which a patent is kept enforced. Therefore, thanks to its large market, Germany currently enjoys a more than proportional share of renewal fees' income generated by the average European patent.

The **'council proposal' weighting scheme** (referred to as a potential "negotiated" scheme in some tables and diagrams) is quite complex, as it takes into account the countries' size, their languages, their innovation potentials, etc. It is also not straightforward to compute. Furthermore, if the criteria used in the weightings were to evolve over time, this would add further complexity to the calculations.

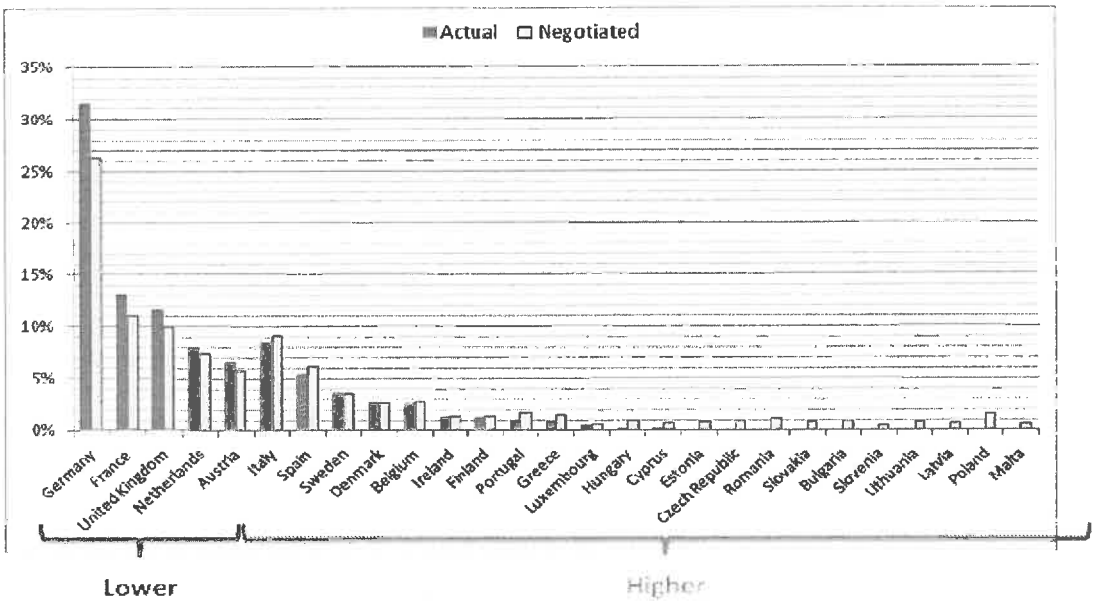
The **GDP weighting scheme** is simpler and is in our opinion a scheme that better rewards innovative activity, so it could be perceived to be more effective. It is very easy to compute and communicate, and rewards countries with a high economic performance, which probably originates from innovative efforts. Catching up countries and dynamic economies would actually be rewarded by this scheme.

TABLE 2. PROS AND CONS OF THREE ALTERNATIVE DISTRIBUTION KEYS

Distribution keys	Assessment
Actual distribution of NPOs' renewal fees' income	Large bias in favor of large countries, especially the largest (Germany)
"Council proposal" weighting scheme	Complex, not easy to compute and to communicate, takes into account the linguistic specificities.
GDP weighting scheme	Easy to compute and communicate, favors countries with a high economic performance

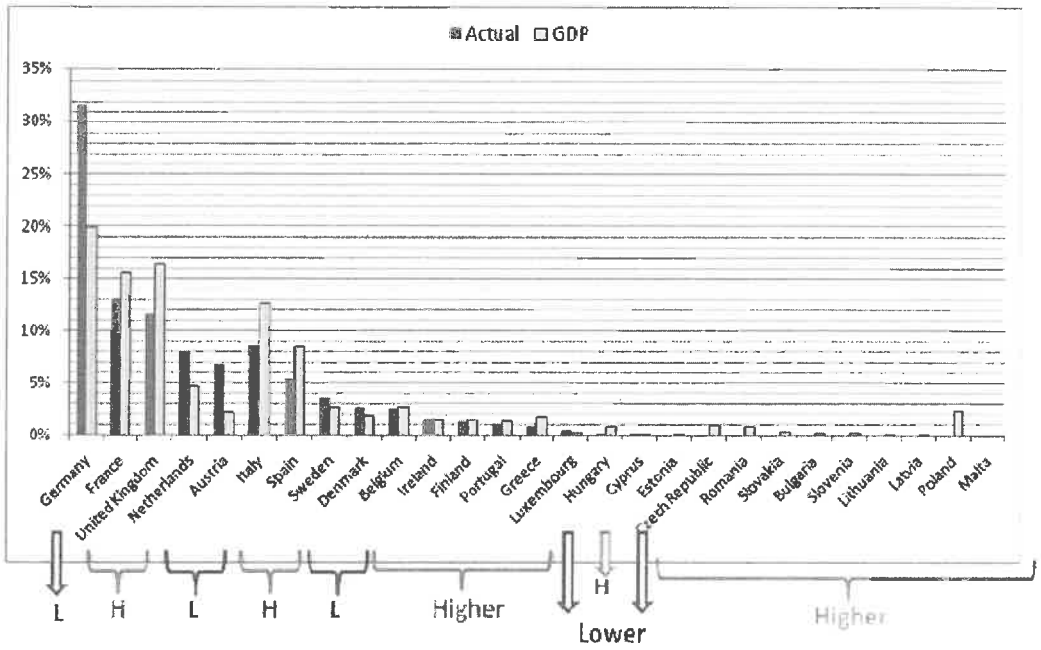
The three following graphs (Fig. 13, Fig. 14, Fig. 15 and Fig. 16) illustrate the bilateral differences observed between the three weighting schemes for a given level of revenue.

FIG. 13. "ACTUAL" VS "COUNCIL PROPOSAL" DISTRIBUTION KEYS



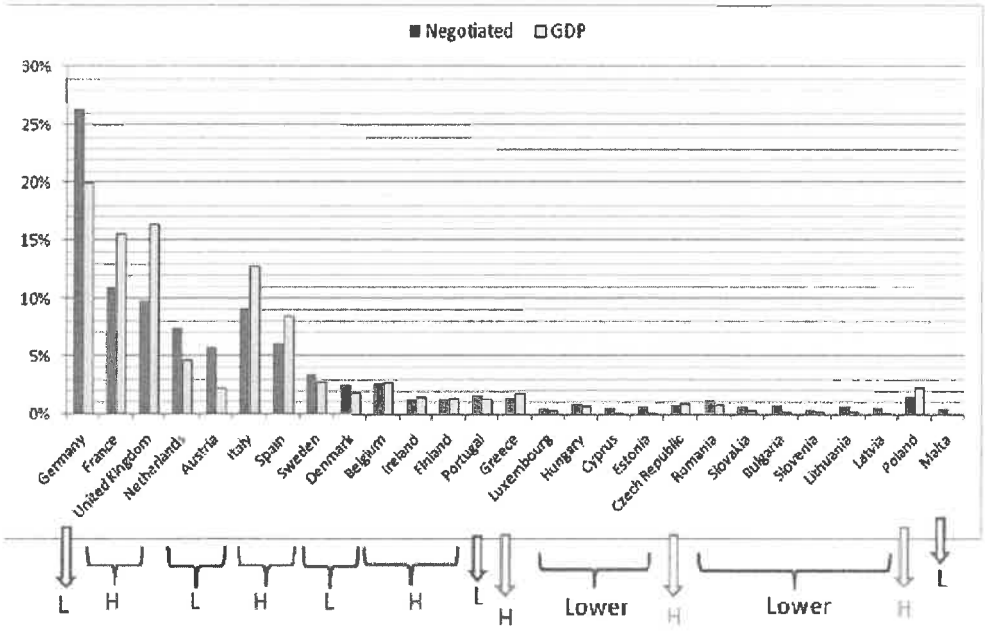
Source: European Council document and own calculations, cf. Table A1 in the appendix.

FIG. 14. "ACTUAL" VS "GDP" DISTRIBUTION KEYS



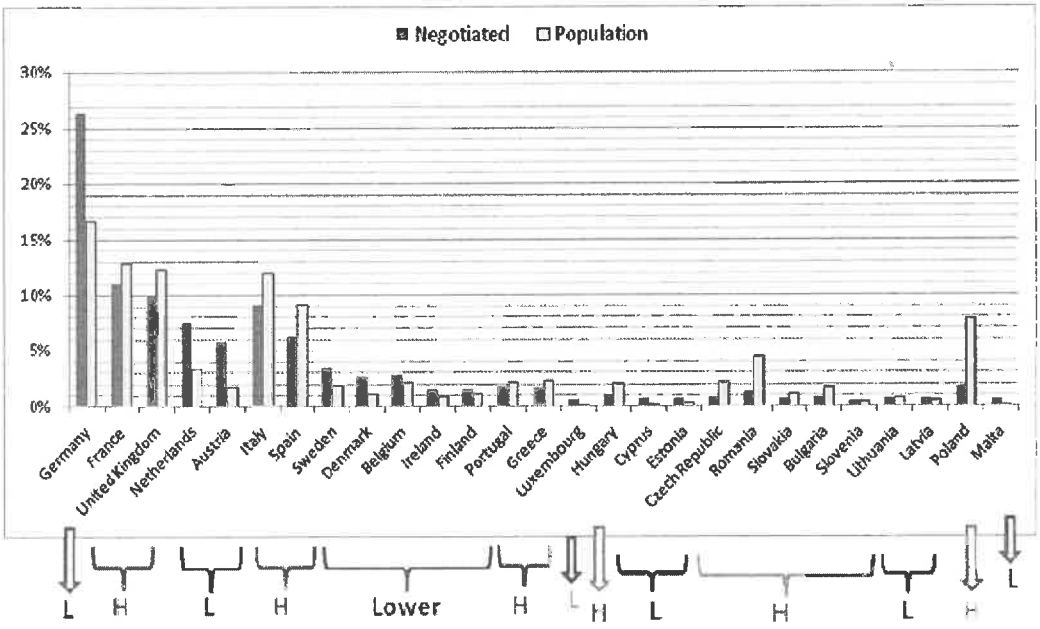
Source: European Council document and Eurostat 2006 for the GDP (million €), cf. Table A1 in the appendix.

FIG. 15. "COUNCIL PROPOSAL" VS "GDP" DISTRIBUTION KEYS



Source: European Council document and Eurostat 2006 for the GDP (million €), cf. Table A1 in the appendix.

FIG. 16. "COUNCIL PROPOSAL" VS "POPULATION" DISTRIBUTION KEYS



Source: data provided by the European Council, cf. Table A1 in the appendix.

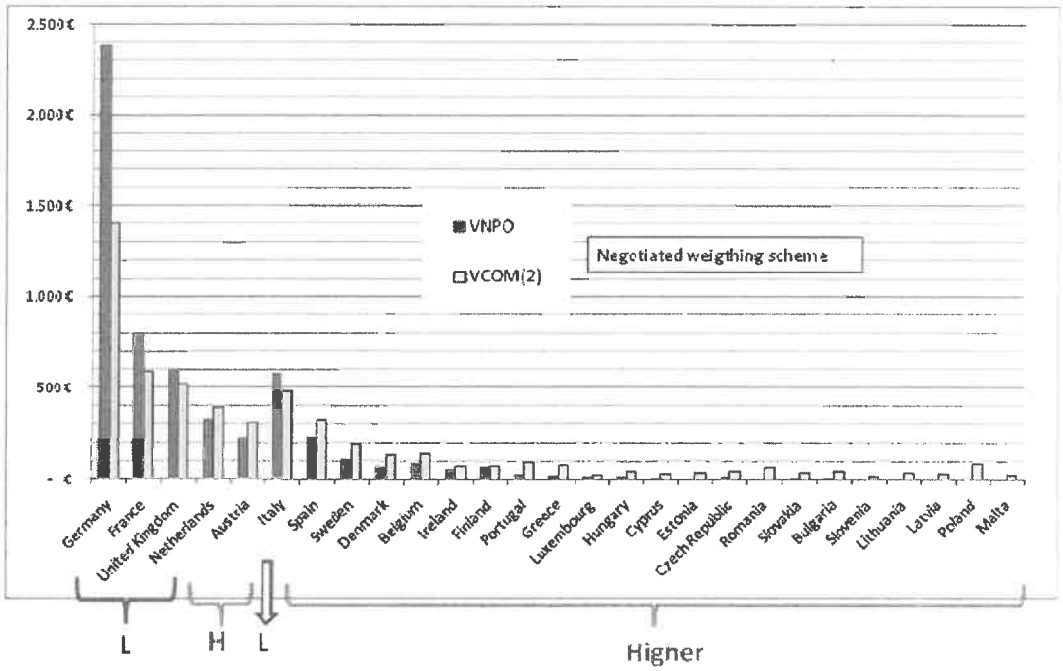
The three distribution keys have their own implications on the actual revenue sharing related to the renewal fees' income generated by the COMPAT. Some countries loose and other win, depending on the reference. Instead of analyzing cross country differences in distribution keys it is more interesting to look at the total revenue generated by an average patent, and then derive the revenue for each NPO, because a distribution key might be lower for a country, but the actual revenue higher due to a much higher total revenue generated by renewal fees, as illustrated in Fig. 12.

C. REVENUE PER PATENT IN EACH NATIONAL PATENT OFFICE

Fig. 17 to Fig. 20 present the renewal fees' income generated by an average patent under the current European patent system (where the income is generated by each NPO) and under the COMPAT, with a distribution key based on the alternative weighting schemes.

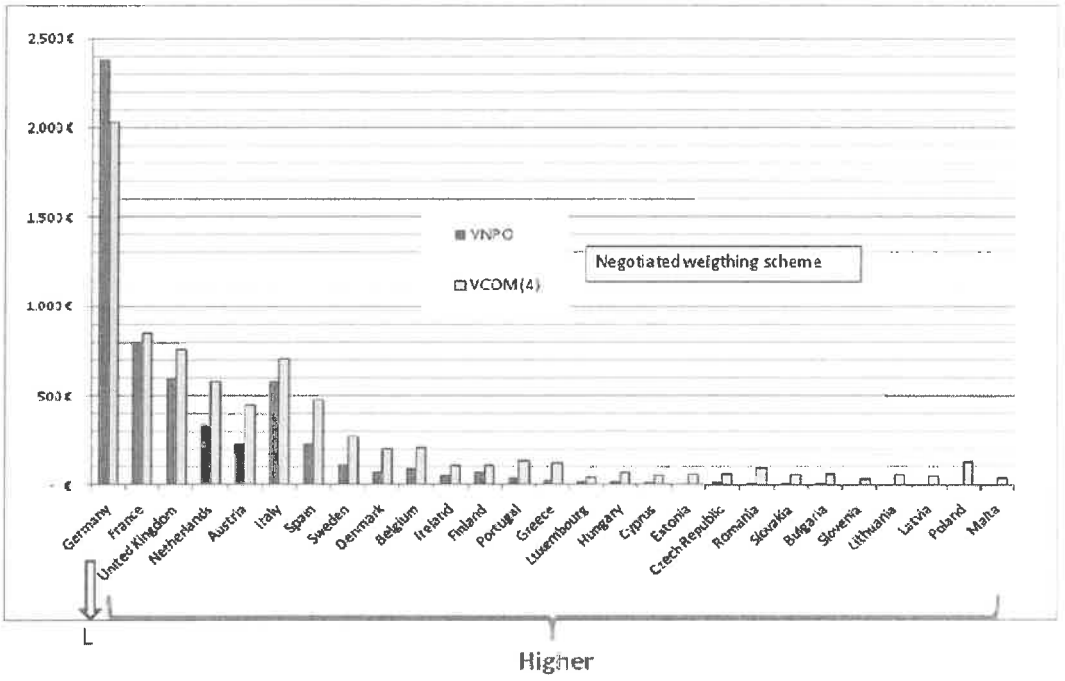
It clearly appears, that with the VCOM(200) and the VCOM(300) renewal fee schedules, all NPO would have a higher income with the COMPAT than with the European patent. This is due to the much higher total income generated by one patent (cf. Fig 12). Smaller countries actually largely benefit from the COMPAT, because they have a relatively low revenue with the European patent, due to the very low validation rate (Germany actually benefited from being the largest economic area: Table A1 in the appendix shows that Germany actually has 32% of the total renewal fees revenues generated by all NPOs under the current European patent system, whereas Germany accounts for 'only' 20% of EU GDP or 17% of EU population. With the VCOM(2) and VCOM(4) fees schedules some more countries see a drop in their revenues.

FIG. 17. NPO'S RENEWAL FEES INCOME UNDER EP AND COMPAT – VCOM(2)



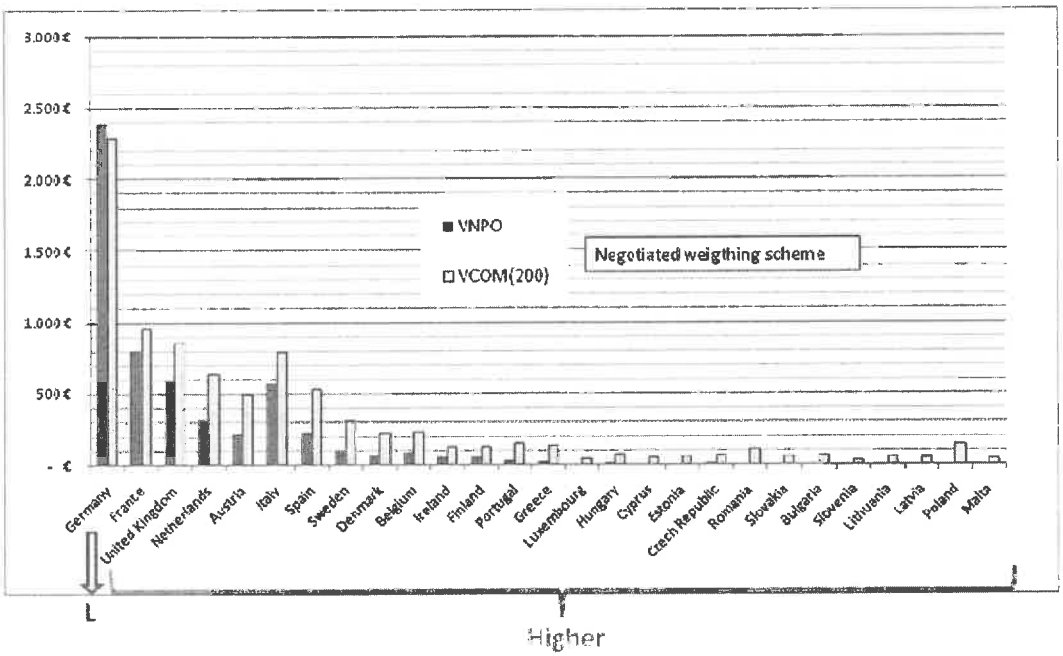
Source: own calculation based on total renewal fees' income presented in Fig. 12 and on distribution keys presented in Fig. 13, Fig. 14, Fig. 15 and Fig. 16, and in appendix Table A1.

FIG. 18. NPO'S RENEWAL FEES INCOME UNDER EP AND COMPAT – VCOM(4)



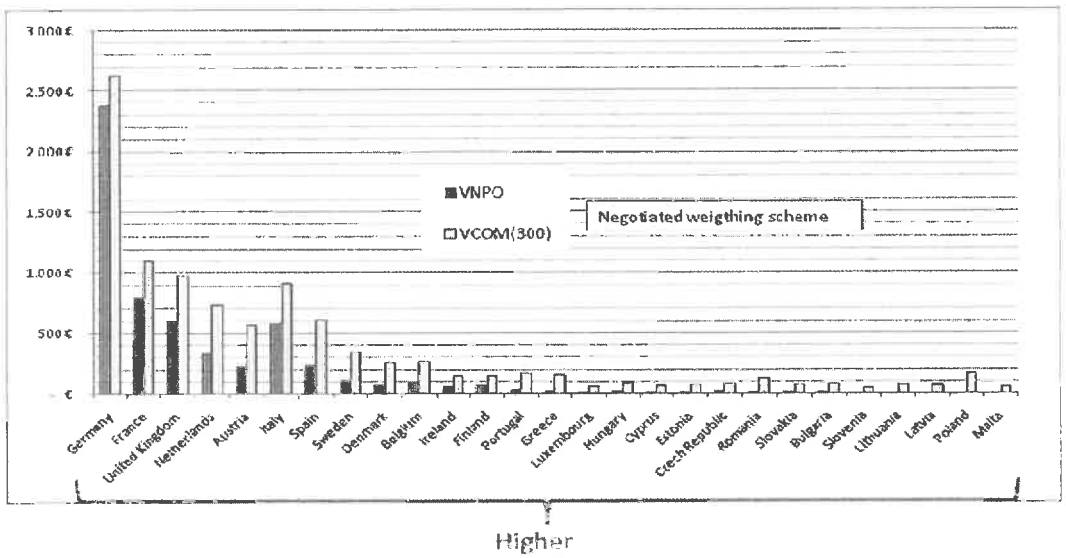
Source: own calculation based on total renewal fees' income presented in Fig. 12 and on distribution keys presented in Fig. 13, Fig. 14, Fig. 15 and Fig. 16, and in appendix Table A1.

FIG. 19. NPO'S RENEWAL FEES INCOME UNDER EP AND COMPAT – VCOM(200)



Source: own calculation based on total renewal fees' income presented in Fig. 12 and on distribution keys presented in Fig. 13, Fig. 14, Fig. 15 and Fig. 16; and in appendix Table A1.

FIG. 20. NPO'S RENEWAL FEES INCOME UNDER EP AND COMPAT – VCOM(300)



Source: own calculation based on total renewal fees' income presented in Fig. 12 and on distribution keys presented in Fig. 13, Fig. 14, Fig. 15 and Fig. 16, and in appendix Table A1.

TABLE 3. NPO'S RENEWAL FEES INCOME UNDER EP AND COMPAT

	VNPO	VCOM(4)			VCOM(200)		
		Negotiated	GDP	Population	Negotiated	GDP	Population
EPO	5.686 €	7.729 €	7.729 €	7.729 €	8.702 €	8.702 €	8.702 €
Germany	2.386 €	2.033 €	1.541 €	1.284 €	2.289 €	1.735 €	1.446 €
France	802 €	850 €	1.200 €	989 €	957 €	1.351 €	1.114 €
United Kingdom	597 €	757 €	1.269 €	950 €	853 €	1.429 €	1.070 €
Netherlands	332 €	572 €	358 €	256 €	644 €	404 €	288 €
Austria	227 €	441 €	171 €	130 €	496 €	192 €	146 €
Italy	576 €	703 €	982 €	922 €	792 €	1.106 €	1.038 €
Spain	230 €	471 €	652 €	694 €	531 €	734 €	782 €
Sweden	111 €	271 €	208 €	142 €	305 €	234 €	160 €
Denmark	71 €	201 €	146 €	84 €	226 €	164 €	95 €
Belgium	88 €	209 €	210 €	165 €	235 €	237 €	186 €
Ireland	55 €	108 €	118 €	67 €	122 €	132 €	76 €
Finland	70 €	108 €	111 €	83 €	122 €	125 €	93 €
Portugal	31 €	131 €	103 €	165 €	148 €	116 €	186 €
Greece	21 €	116 €	142 €	175 €	131 €	159 €	197 €
Luxembourg	13 €	39 €	22 €	8 €	44 €	25 €	9 €
Hungary	15 €	70 €	60 €	158 €	78 €	67 €	177 €
Cyprus	10 €	46 €	10 €	12 €	52 €	11 €	14 €
Estonia	5 €	54 €	9 €	20 €	61 €	10 €	23 €
Czech Republic	17 €	62 €	75 €	161 €	70 €	85 €	181 €
Romania	6 €	93 €	65 €	337 €	104 €	73 €	380 €
Slovakia	8 €	54 €	30 €	84 €	61 €	33 €	95 €
Bulgaria	6 €	62 €	17 €	120 €	70 €	19 €	135 €
Slovenia	4 €	31 €	21 €	31 €	35 €	23 €	35 €
Lithuania	1 €	54 €	16 €	53 €	61 €	18 €	60 €
Latvia	0 €	46 €	11 €	36 €	52 €	12 €	40 €
Poland	3 €	124 €	181 €	595 €	139 €	203 €	669 €
Malta	- €	39 €	3 €	6 €	44 €	4 €	7 €

Source: own calculation based on total renewal fees' income presented in Fig. 12 and on distribution keys presented in Fig. 13, Fig. 14, Fig. 15 and Fig. 16

Table 3 shows that with the VCOM(200) fee structure, the EPO would earn EUR 8,700 EUR per patent granted on average. Germany would have an income of EUR 1,500 to 2,300 depending on the distribution key. These revenues must be compared to the actual revenue per patent of about EUR 2,400 in Germany. A large number of smaller countries benefit from a sharp, and fair, increase in their revenue thanks to the COMPAT

The net differences between the renewal fees revenues generated by the European patent (VNPO) and those generated by the community patent (VCOMs) are presented in Table 4 for VCOM(4) and VCOM(200). The simulations with the other renewal fees schedules are presented in Appendix Table A.2. **For instance, with the VCOM(200) and the GDP distribution key, only Germany and Austria would have a lower revenue per patent.** For Germany this is due to the loss of its leading position within the European patent system, whereas for Austria this is due to relatively high national renewal fees that generate a higher income than the COMPAT would generate with the VCOM(200).

These simulations concern the average renewal fees' income generated by a patent under the COMPAT system, for each NPO. A natural question is therefore to assess the extent to which applicants will rely on the COMPAT or continue to use the current European Patent. This issue is analyzed in the next subsection.

A worst case scenario is presented in Appendix Table A2b, where the German maintenance rate is used, with the VCOM(2) fee schedule. In this case the large countries could have a lower renewal fees' income, but smaller countries continue to earn more.

TABLE 4. NPO'S RENEWAL FEES INCOME UNDER EP AND COMPAT - NET DIFFERENCES

	VCOM(4)			VCOM(200)		
	Negotiated	GDP	Population	Negotiated	GDP	Population
EPO	2.043 €	2.043 €	2.043 €	3.017 €	3.017 €	3.017 €
Germany	- 353 €	- 845 €	- 1.101 €	- 97 €	- 651 €	- 940 €
France	48 €	398 €	188 €	156 €	549 €	312 €
United Kingdom	161 €	673 €	354 €	256 €	833 €	473 €
Netherlands	240 €	27 €	- 76 €	312 €	72 €	- 44 €
Austria	214 €	- 56 €	- 97 €	269 €	- 34 €	- 81 €
Italy	127 €	406 €	346 €	216 €	530 €	462 €
Spain	241 €	422 €	464 €	301 €	504 €	552 €
Sweden	160 €	97 €	31 €	194 €	123 €	49 €
Denmark	130 €	75 €	13 €	155 €	94 €	24 €
Belgium	121 €	122 €	78 €	147 €	149 €	98 €
Ireland	53 €	62 €	12 €	66 €	77 €	20 €
Finland	38 €	41 €	13 €	52 €	55 €	23 €
Portugal	100 €	72 €	134 €	116 €	85 €	155 €
Greece	95 €	120 €	153 €	109 €	138 €	175 €
Luxembourg	26 €	10 €	- 5 €	31 €	13 €	- 4 €
Hungary	54 €	44 €	142 €	63 €	52 €	162 €
Cyprus	36 €	- 1 €	2 €	42 €	1 €	4 €
Estonia	49 €	4 €	15 €	56 €	5 €	18 €
Czech Republic	44 €	58 €	143 €	52 €	67 €	164 €
Romania	87 €	59 €	331 €	99 €	67 €	374 €
Slovakia	47 €	22 €	77 €	53 €	26 €	87 €
Bulgaria	56 €	10 €	114 €	63 €	13 €	129 €
Slovenia	27 €	16 €	27 €	31 €	19 €	31 €
Lithuania	53 €	15 €	52 €	60 €	17 €	59 €
Latvia	46 €	10 €	36 €	52 €	12 €	40 €
Poland	121 €	178 €	592 €	136 €	200 €	666 €
Malta	39 €	3 €	6 €	44 €	4 €	7 €

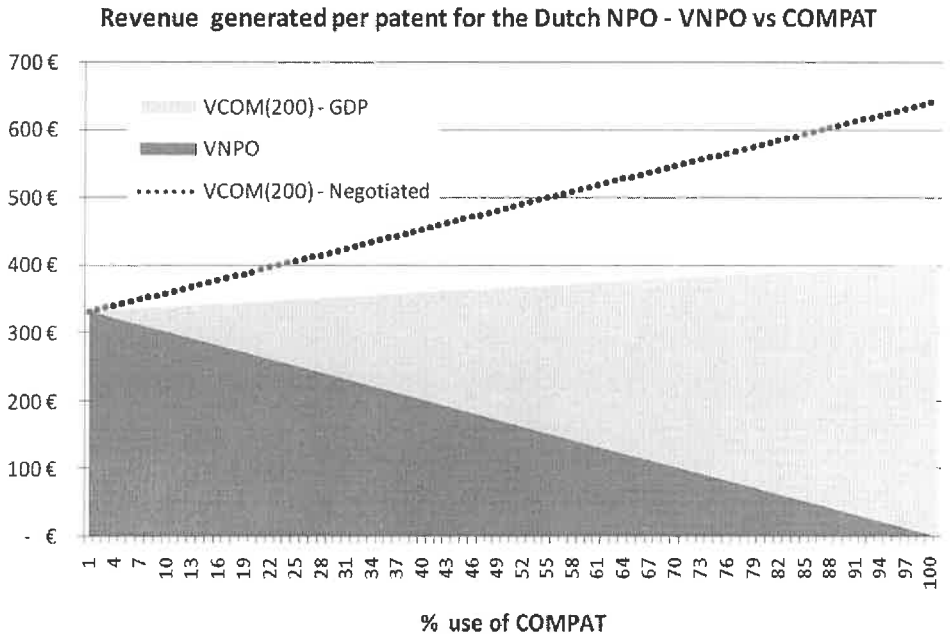
Source: own calculation based on total renewal fees' income presented in Fig. 12 and on distribution keys presented in Fig. 13, Fig. 14, Fig. 15 and Fig. 16

D. ON THE SUBSTITUTION BETWEEN THE COMPAT AND THE EUROPEAN PATENT

Fig. 21 presents the simulations for the Dutch patent office. It shows the total revenue generated by the average EPO granted patent (the VNPO revenue is computed from the average validation rate in The Netherlands and the average maintenance rate of the European patent in the Netherlands, whereas the VCOM(200) is computed from the total revenue generated by an average COMPAT, with a VCOM(200) fee schedule, and with two alternative distribution keys that are used to obtain the revenues flowing back to the Dutch patent office). If the patent is not converted to a COMPAT, it would generate about €332 (the extreme left of Fig. 21). The higher the probability (or the oberved share) to switch towards the COMPAT, the higher the revenue

for the Dutch patent office (Fig. 21 is actually a graphical representation of the data presented in Table 3). A full use of the COMPAT would generate nearly €644 per patent granted by the EPO with the 'Council proposal' distribution key and €404 with the GDP weighting scheme. These figures can be multiplied by the total number of patents granted by the EPO, at equilibrium (or run-in-period hypothesis): the result would provide an idea of the total income for the NPOs.

FIG. 21. THE USE OF THE COMPAT AND NPO'S REVENUES, THE NETHERLANDS



Source: own calculation based on total renewal fees' income presented in Table 3.

The important conclusion that must drawn from Fig. 21 is that whatever the substitution rate between the COMPAT and the European patent, national patent offices would earn an income that is at least at the level of the current income under the European patent. The figures presented in Appendix A3 show similar simulations for all national patent offices.

This 'higher' income is due to the fact that more patents would be enforced for a longer 'average' period, and with higher fees (than in a single country).

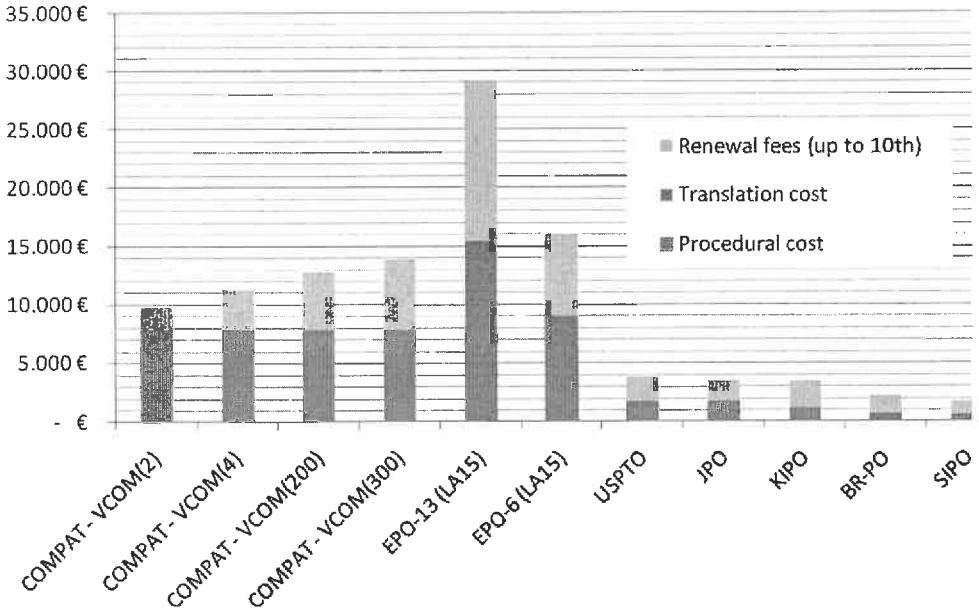
3. IMPLICATIONS OF THE COMPAT ON RELATIVE PATENTING COSTS

The first section underlined two types of failures induced by the currently fragmented patent system in Europe. First is the prohibitive cost of patenting, due to the cumulated national renewal fees that applicants must pay to keep their patent in force. Second are the incongruities and high uncertainty that occur when several parallell litigations take place.

These two types of failure could vanish with the COMPAT and a unified patent litigation system.

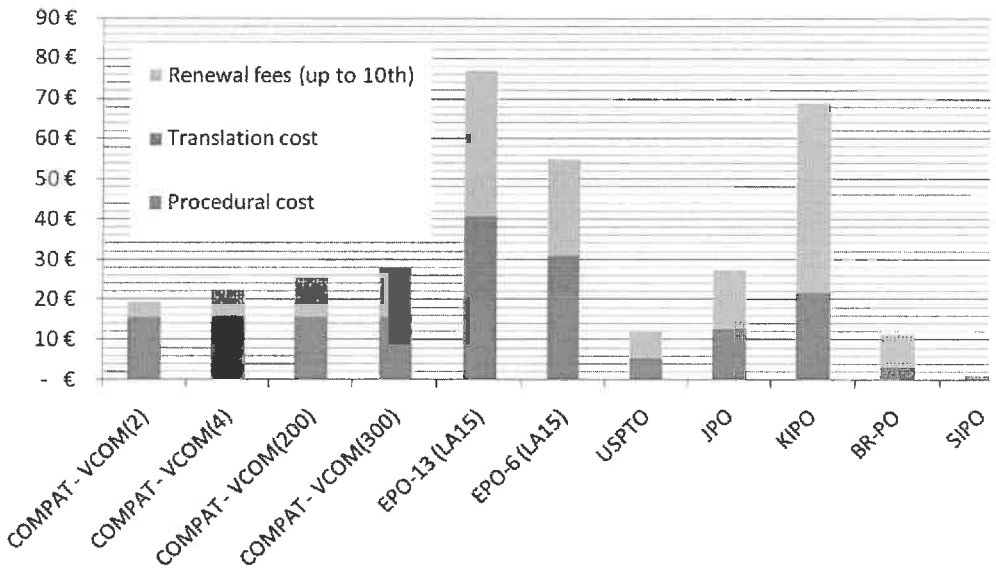
Fig. 22 shows that 10 years of protection with the COMPAT (with the VCOM(200) fee schedule) would cost about EUR 13,000, against EUR 16,000 nowadays for a protection in 6 countries and nearly EUR 30,000 for a protection in 13 countries. This must be compared with a total cost lower than EUR 4,000 in all other large economic areas.

FIG. 22. INTERNATIONAL COMPARISON OF PATENTING COSTS WITH COMPAT



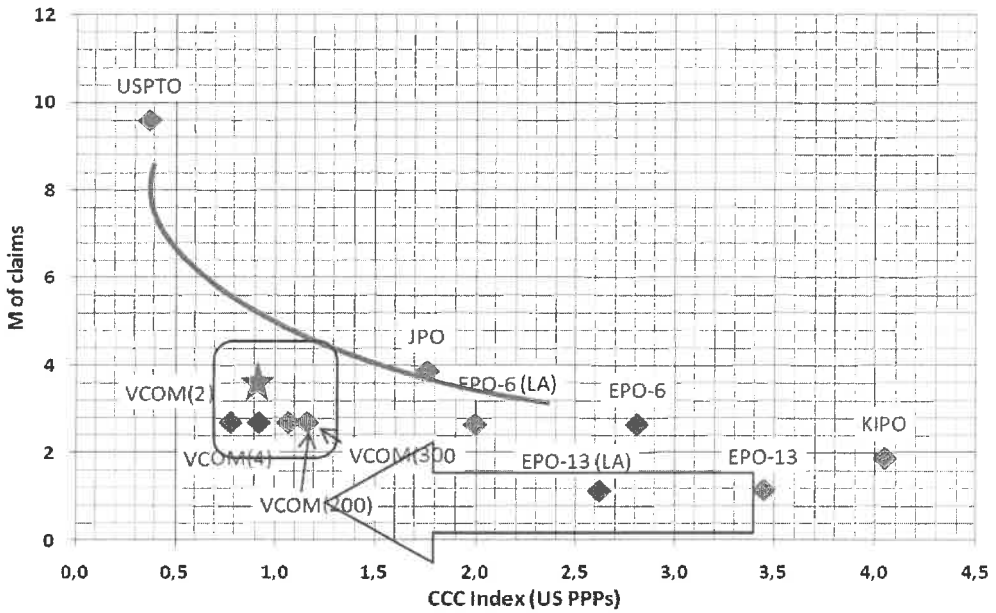
These absolute numbers do not account for the market size covered by the patents. Doing so would logically put Europe in a much better situation, thanks to its market of about 600 million inhabitants. Fig. 23 shows that 10 years of protection with the COMPAT (with the VCOM(200) fee schedule) would cost about EUR 26 per million capita (like in Japan), against EUR 55 per million capita nowadays for a protection in 6 countries and EUR 76 for a protection in 13 countries. In the USA the one patent costs about EUR 12 per million capita.

FIG. 23. INTERNATIONAL COMPARISON OF PATENTING COSTS PER MILLION CAPITA



Finally, accounting for the size of patents (number of claims per patent) leads to a cost per claim per capita in Europe that would be between Japan and the USA. The cost per claim per million capita would be of (in US purchasing power parities) $1.2 in Europe, against $0.4 in the US and $1.7 in Japan. Figure 24 suggests that the demand for patents (the millions of claims that were filed) in 2006 seems to be related to the relative fees, according to a traditional demand curve.

FIG. 24. RELATIVE PATENTING COSTS AND THE DEMAND FOR PATENTS



Existing studies aiming at evaluating the fee elasticity of demand for patents is of about -0.4 (cf; the studies by de Rassenfosse and van Pottelsberghe (2007, 2008, 2009). In other words, a fee increase of 10% would lead to a drop in patent filing of about 4%. Therefore, the 60% decrease

in relative prices due to the implementation of the COMPAT could induce a 24% increase in the demand for patents (cf. the blue star in Fig. 24).

In a nutshell, the COMPAT with a unified jurisdiction would reduce both the costs and uncertainty currently associated with the fragmented European patent system, while quality in the examination process would be maintained.

The beneficial effects of the COMPAT (cost savings, construction of the single market, lower complexity) would make the patent system more accessible for SMEs and for universities in Europe. At the same time it would make the European market more attractive for foreign companies.

4. SUCCESS FACTORS AND F.A.Q.

It is important to keep in mind that the above simulations are based on key working hypotheses. The COMPAT project represents a drastic change for the European patent system, which would induce a change in perception (on political, social and economic spheres), and hence an adaptation time.

Many factors will influence its success, and its relative use. Amongst these the following ones are key:

- **No switch 'back' from the COMPAT towards the EP**: this condition was a working hypothesis and is key to ensure the success of the COMPAT. It is clear that if the COMPAT can be transformed into an EP after a few years (and hence getting protected in only one or two countries), the above simulations would not hold anymore. The 'switch-back' option would actually reduce the renewal fee income of a majority of national patent office.

- **Affordable renewal fees**: it is important to set up affordable renewal fees that would constitute a fair balance between the provision of an incentive to innovate and the provision of a too long monopolistic period. Higher fees would induce a faster drop in the public domain, while smaller fees would induce a longer enforcement period. The chosen fee structure should not be higher than the equivalent of 4 countries (VCOM(4)), the actual number of countries validated within the European Union. It must be kept in mind that the few patents that stay valid up to 20 years are generally renewed in only one or two countries. In this respect, the VCOM(200) might be preferred to the VCOM(300) because the latter is actually higher than the VCOM(4).

- **Simplicity matters**: the current system is already complex. The design of the COMPAT should be as simple as possible to make it attractive. In this respect, it is of prime importance that all EU27 countries enter into the process, in order to avoid a dual system.

F.A.Q.

1. Have you calculated whether any of the models will cover the EPO costs for processing patent filings under the compat?

Yes, it is implicitly and explicitly explained in the main text. If the COMPAT generate more revenue for NPOs, it will also generate more revenues for the EPO. We have added the total renewal fees revenue for the EPO under the current European patent system and under the COMPAT in Table 3 (first row).

2. Figure 22 appears to show that processing costs will remain the same but renewal fees will reduce dramatically. We think that there needs to be a balance between upfront fees and the renewal fees.

It must be kept in mind that this examination would relate to the 35 EPC Member states. If a minimum level of quality is to be guaranteed it is normal to have relatively high fees. In terms of relative costs (per million capita), however, the European patent system becomes much more affordable, due to its 600+ million capita.

3. It is clear from fig. 10 that the maintenance rates for VCOM(8) are still substantially higher than current DE renewal rates, but your conclusions prefer a lower fee level - something closer to the equivalent of 4 Member States. Why can't we have a fee level equivalent to 8 MS which may provide a stronger safeguard in covering the costs of the EPO in administering the Community patent. Have you done any specific simulation work on DE renewal fee rates and how these would affect renewal income/maintenance rates?

With a level of fees corresponding to 8 MS, the COMPAT is unlikely to be preferred to the current European patent because many companies only validate an EPO granted patent in much fewer than 8 Member States – on average in only about 4 to 5 EU countries. The appropriate fee structure of the COMPAT should be attractive to businesses compared to existing European patents, which could be achieved by a level equivalent to a maximum of four countries.

4. Germany's share of the renewal fees - Germany's patent filings are affected by the requirement for employers to protect employees' inventions - so there may be no direct link with market size, population or GDP.

In this paper we take into account all patent applications at the EPO, whatever their country of origin. The German protection of employees' invention would increase the propensity to patent by German firms. This is partly captured by the variables EPC membership and IPI index in our empirical model (cf. Table 1)

5. The age of membership parameter which you have set in your simulations is equivalent to the age of membership of the oldest MS of the EU. The Community patent is completely new so the length of time renewed might be as short as in countries only recently adopting a modern patents system. Have you done any modeling where this variable is set shorter?

This is an interesting point and we have performed the simulations with a zero age. It does not change the results drastically, but allows us to argue that we rely on conservative assumptions.

6. There are concerns with the proposed distribution key from the Council Presidency. We believe that there are some errors in the calculations, and we note that this key is sometimes referred to as the "negotiated" distribution key even though it remains a proposal.

We might have used the term 'negotiated' weighting scheme in the main text, and we apologize for that. In this respect, our personal preference is for the GDP weighting scheme, but this is naturally for Member States to decide upon.

7. Throughout the presentation you have investigated methods of achieving high maintenance levels. However, high maintenance levels means that there are more patents in force for a longer time period. This can have a negative impact on the public and how they are able to innovate. Clearly, maintenance levels need to be set to provide a balance between encouraging renewals and also encouraging companies to not renew when their patent is no longer economically viable.

This is an interesting remark, and we would advocate that we must continue to trust the decision of the EPO. If a patent is granted through high quality selection criteria, then there is no problem of having it maintained for 20 years.

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APPENDIX

A.1. VARIOUS DISTRIBUTION KEYS

	Actual*	Council doc.*	GDP**	Population*
Germany	31,6%	26,3%	19,9%	16,6%
France	13,1%	11,0%	15,5%	12,8%
United Kingdom	11,6%	9,8%	16,4%	12,3%
Netherlands	8,0%	7,4%	4,6%	3,3%
Austria	6,7%	5,7%	2,2%	1,7%
Italy	8,6%	9,1%	12,7%	11,9%
Spain	5,4%	6,1%	8,4%	9,0%
Sweden	3,6%	3,5%	2,7%	1,8%
Denmark	2,6%	2,6%	1,9%	1,1%
Belgium	2,5%	2,7%	2,7%	2,1%
Ireland	1,4%	1,4%	1,5%	0,9%
Finland	1,3%	1,4%	1,4%	1,1%
Portugal	1,1%	1,7%	1,3%	2,1%
Greece	0,9%	1,5%	1,8%	2,3%
Luxembourg	0,5%	0,5%	0,3%	0,1%
Hungary	0,2%	0,9%	0,8%	2,0%
Cyprus	0,2%	0,6%	0,1%	0,2%
Estonia	0,1%	0,7%	0,1%	0,3%
Czech Republic	0,1%	0,8%	1,0%	2,1%
Romania	0,1%	1,2%	0,8%	4,4%
Slovakia	0,1%	0,7%	0,4%	1,1%
Bulgaria	0,1%	0,8%	0,2%	1,6%
Slovenia	0,1%	0,4%	0,3%	0,4%
Lithuania	0,0%	0,7%	0,2%	0,7%
Latvia	0,0%	0,6%	0,1%	0,5%
Poland	0,1%	1,6%	2,3%	7,7%
Malta	0,0%	0,5%	0,0%	0,1%
	100%	**100%**	**100%**	**100%**

Source: * data provided by the European Commission
** Eurostat 2006 (million €)

A.2. NPO'S RENEWAL FEES INCOME UNDER EP AND COMPAT (NEXT TABLE IS NET DIFFERENCE FROM VNPO)

	VNPO	VCOM(2)			VCOM(6)			VCOM(300)		
		Negotiated	GDP	Population	Negotiated	GDP	Population	Negotiated	GDP	Population
EPO	5.686 €	5.325 €	5.325 €	5.325 €	9.864 €	9.864 €	9.864 €	9.998 €	9.998 €	9.998 €
Germany	2.386 €	1.401 €	1.062 €	885 €	2.594 €	1.967 €	1.639 €	2.629 €	1.993 €	1.661 €
France	802 €	586 €	827 €	682 €	1.085 €	1.531 €	1.263 €	1.100 €	1.552 €	1.280 €
United Kingdom	597 €	522 €	875 €	655 €	967 €	1.620 €	1.213 €	980 €	1.642 €	1.229 €
Netherlands	332 €	394 €	247 €	176 €	730 €	457 €	327 €	740 €	464 €	331 €
Austria	227 €	304 €	118 €	89 €	562 €	218 €	165 €	570 €	221 €	168 €
Italy	576 €	485 €	677 €	635 €	898 €	1.254 €	1.177 €	910 €	1.271 €	1.193 €
Spain	230 €	325 €	449 €	478 €	602 €	832 €	886 €	610 €	843 €	898 €
Sweden	111 €	186 €	143 €	98 €	345 €	265 €	181 €	350 €	269 €	184 €
Denmark	71 €	138 €	101 €	58 €	256 €	186 €	108 €	260 €	189 €	109 €
Belgium	88 €	144 €	145 €	114 €	266 €	268 €	211 €	270 €	272 €	214 €
Ireland	55 €	75 €	81 €	46 €	138 €	150 €	86 €	140 €	152 €	87 €
Finland	70 €	75 €	76 €	57 €	138 €	142 €	106 €	140 €	143 €	107 €
Portugal	31 €	91 €	71 €	114 €	168 €	132 €	211 €	170 €	133 €	214 €
Greece	21 €	80 €	98 €	120 €	148 €	181 €	223 €	150 €	183 €	226 €
Luxembourg	13 €	27 €	15 €	5 €	49 €	29 €	10 €	50 €	29 €	10 €
Hungary	15 €	48 €	41 €	109 €	89 €	76 €	201 €	90 €	77 €	204 €
Cyprus	10 €	32 €	7 €	9 €	59 €	12 €	16 €	60 €	13 €	16 €
Estonia	5 €	37 €	6 €	14 €	69 €	11 €	26 €	70 €	11 €	26 €
Czech Republic	17 €	43 €	52 €	111 €	79 €	96 €	205 €	80 €	97 €	208 €
Romania	6 €	64 €	45 €	232 €	118 €	83 €	430 €	120 €	84 €	436 €
Slovakia	8 €	37 €	20 €	58 €	69 €	38 €	108 €	70 €	38 €	109 €
Bulgaria	6 €	43 €	12 €	83 €	79 €	21 €	153 €	80 €	22 €	155 €
Slovenia	4 €	21 €	14 €	22 €	39 €	26 €	40 €	40 €	27 €	40 €
Lithuania	1 €	37 €	11 €	37 €	69 €	20 €	68 €	70 €	20 €	69 €
Latvia	0 €	32 €	7 €	25 €	59 €	14 €	46 €	60 €	14 €	46 €
Poland	3 €	85 €	124 €	410 €	158 €	230 €	759 €	160 €	234 €	769 €
Malta	- €	27 €	2 €	4 €	49 €	4 €	8 €	50 €	4 €	8 €

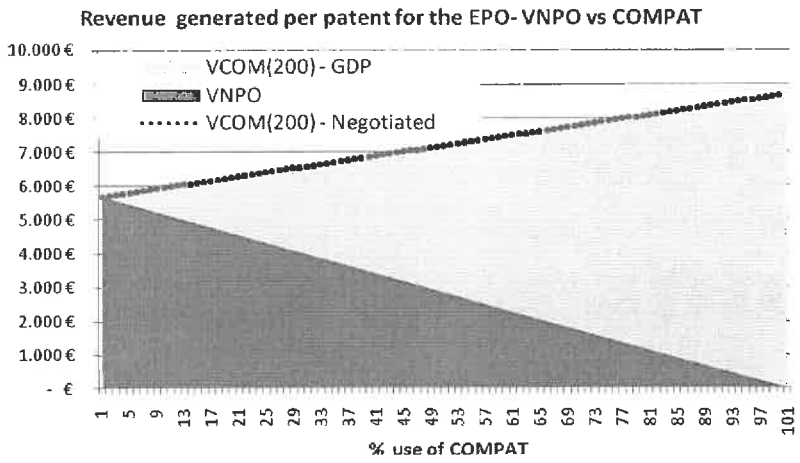
	VCOM(2)			VCOM(6)			VCOM(300)		
	Negotiated	GDP	Population	Negotiated	GDP	Population	Negotiated	GDP	Population
EPO	- 360 €	- 360 €	- 360 €	4.179 €	4.179 €	4.179 €	4.312 €	4.312 €	4.312 €
Germany	- 985 €	- 1.324 €	- 1.501 €	209 €	- 419 €	- 747 €	244 €	- 393 €	- 724 €
France	- 216 €	25 €	- 120 €	283 €	729 €	461 €	298 €	750 €	478 €
United Kingdom	- 75 €	278 €	58 €	370 €	1.024 €	616 €	383 €	1.046 €	633 €
Netherlands	62 €	- 85 €	- 156 €	398 €	126 €	- 5 €	408 €	132 €	- 1 €
Austria	77 €	- 109 €	- 138 €	336 €	- 9 €	- 61 €	343 €	- 6 €	- 59 €
Italy	- 91 €	101 €	59 €	322 €	678 €	601 €	334 €	695 €	617 €
Spain	95 €	219 €	248 €	371 €	602 €	656 €	380 €	613 €	668 €
Sweden	76 €	32 €	- 13 €	234 €	155 €	70 €	239 €	158 €	73 €
Denmark	68 €	30 €	- 13 €	186 €	115 €	37 €	189 €	118 €	38 €
Belgium	56 €	57 €	26 €	179 €	180 €	123 €	182 €	184 €	126 €
Ireland	19 €	26 €	- 9 €	83 €	95 €	30 €	85 €	97 €	31 €
Finland	5 €	6 €	- 13 €	68 €	71 €	36 €	70 €	73 €	37 €
Portugal	59 €	40 €	82 €	136 €	100 €	180 €	138 €	102 €	182 €
Greece	59 €	76 €	99 €	127 €	159 €	202 €	129 €	162 €	205 €
Luxembourg	14 €	3 €	- 7 €	37 €	16 €	- 3 €	37 €	16 €	- 3 €
Hungary	33 €	26 €	93 €	73 €	61 €	186 €	75 €	62 €	189 €
Cyprus	22 €	- 4 €	- 2 €	49 €	2 €	6 €	50 €	2 €	6 €
Estonia	32 €	1 €	9 €	64 €	6 €	21 €	65 €	6 €	21 €
Czech Republic	25 €	34 €	93 €	61 €	79 €	188 €	63 €	80 €	190 €
Romania	58 €	39 €	226 €	113 €	77 €	424 €	114 €	78 €	430 €
Slovakia	30 €	13 €	51 €	61 €	30 €	100 €	62 €	31 €	101 €
Bulgaria	36 €	5 €	76 €	73 €	15 €	147 €	74 €	15 €	149 €
Slovenia	17 €	10 €	17 €	35 €	22 €	36 €	36 €	22 €	36 €
Lithuania	36 €	10 €	35 €	68 €	19 €	67 €	69 €	19 €	68 €
Latvia	32 €	7 €	24 €	59 €	13 €	45 €	60 €	13 €	46 €
Poland	82 €	121 €	407 €	155 €	228 €	756 €	157 €	231 €	766 €
Malta	27 €	2 €	4 €	49 €	4 €	8 €	50 €	4 €	8 €

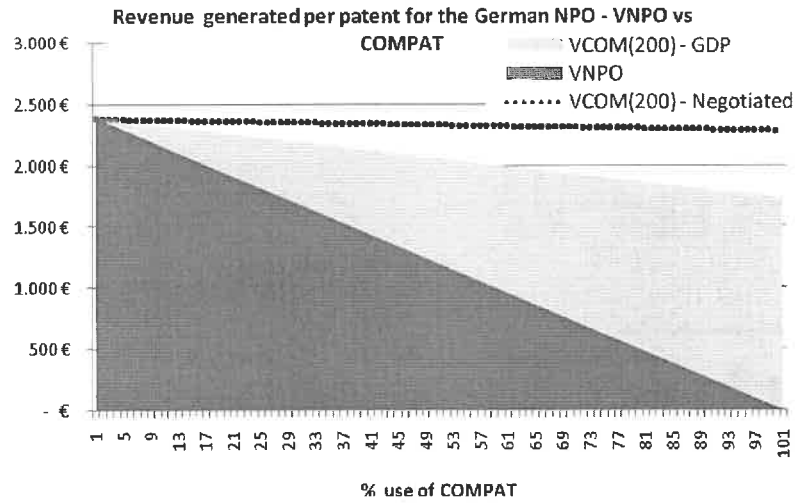
A.2B. NPO'S RENEWAL FEES INCOME UNDER EP AND COMPAT;**WORST CASE SCENARIO** WITH GERMAN MAINTENANCE RATE AND VCOM2 OR VCOM(200). NEXT TABLE SHOWS THE NET DIFFERENCE FROM VNPO

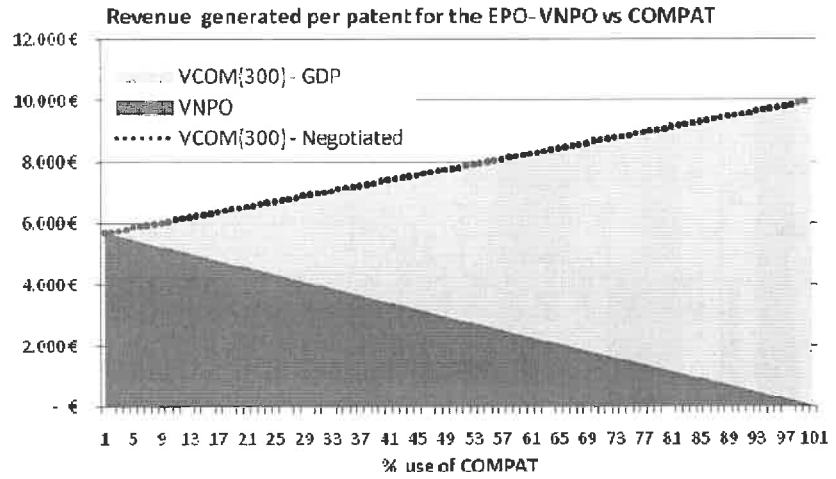
	VNPO	VCOM(2)			VCOM(200)		
		Negotiated	GDP	Population	Negotiated	GDP	Population
EPO	5.686 €	3.821 €	3.821 €	3.821 €	7.008 €	7.008 €	7.008 €
Germany	2.386 €	1.005 €	762 €	635 €	1.843 €	1.397 €	1.164 €
France	802 €	420 €	593 €	489 €	771 €	1.088 €	897 €
United Kingdom	597 €	374 €	628 €	470 €	687 €	1.151 €	862 €
Netherlands	332 €	283 €	177 €	127 €	519 €	325 €	232 €
Austria	227 €	218 €	84 €	64 €	399 €	155 €	117 €
Italy	576 €	348 €	486 €	456 €	638 €	891 €	836 €
Spain	230 €	233 €	322 €	343 €	427 €	591 €	630 €
Sweden	111 €	134 €	103 €	70 €	245 €	189 €	129 €
Denmark	71 €	99 €	72 €	42 €	182 €	132 €	76 €
Belgium	88 €	103 €	104 €	82 €	189 €	191 €	150 €
Ireland	55 €	53 €	58 €	33 €	98 €	107 €	61 €
Finland	70 €	53 €	55 €	41 €	98 €	101 €	75 €
Portugal	31 €	65 €	51 €	82 €	119 €	94 €	150 €
Greece	21 €	57 €	70 €	86 €	105 €	128 €	158 €
Luxembourg	13 €	19 €	11 €	4 €	35 €	20 €	7 €
Hungary	15 €	34 €	30 €	78 €	63 €	54 €	143 €
Cyprus	10 €	23 €	5 €	6 €	42 €	9 €	11 €
Estonia	5 €	27 €	4 €	10 €	49 €	8 €	18 €
Czech Republic	17 €	31 €	37 €	79 €	56 €	68 €	146 €
Romania	6 €	46 €	32 €	167 €	84 €	59 €	306 €
Slovakia	8 €	27 €	15 €	42 €	49 €	27 €	76 €
Bulgaria	6 €	31 €	8 €	59 €	56 €	15 €	109 €
Slovenia	4 €	15 €	10 €	15 €	28 €	19 €	28 €
Lithuania	1 €	27 €	8 €	26 €	49 €	14 €	48 €
Latvia	0 €	23 €	5 €	18 €	42 €	10 €	33 €
Poland	3 €	61 €	89 €	294 €	112 €	164 €	539 €
Malta	- €	19 €	2 €	3 €	35 €	3 €	6 €

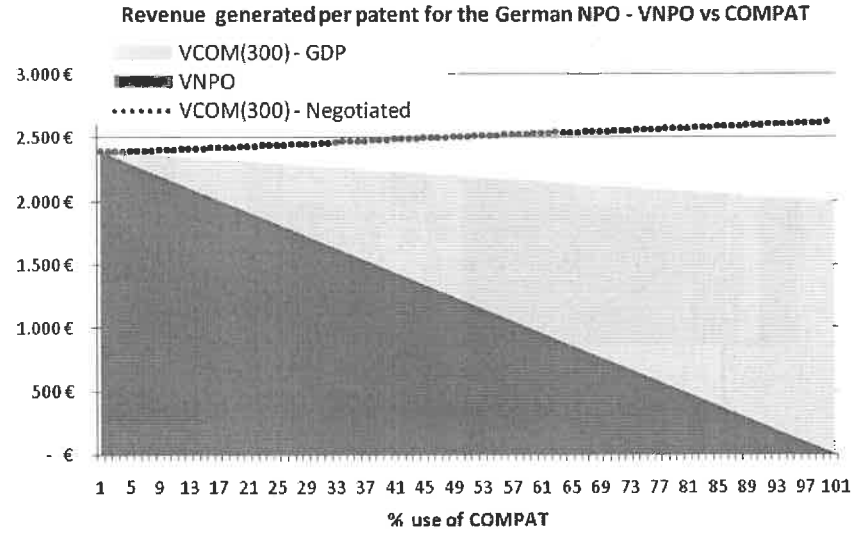
	VCOM(2)			VCOM(200)		
	Negotiated	GDP	Population	Negotiated	GDP	Population
EPO	- 1.864 €	- 1.864 €	- 1.864 €	1.322 €	1.322 €	1.322 €
Germany	- 1.381 €	- 1.624 €	- 1.751 €	- 543 €	- 989 €	- 1.221 €
France	- 881 €	- 209 €	- 313 €	- 31 €	286 €	95 €
United Kingdom	- 222 €	31 €	- 127 €	90 €	554 €	265 €
Netherlands	- 49 €	- 155 €	- 205 €	187 €	- 7 €	- 100 €
Austria	- 9 €	- 142 €	- 163 €	173 €	- 72 €	- 109 €
Italy	- 228 €	- 90 €	- 120 €	62 €	315 €	260 €
Spain	3 €	92 €	113 €	197 €	361 €	399 €
Sweden	23 €	- 8 €	- 41 €	134 €	78 €	18 €
Denmark	28 €	1 €	- 29 €	111 €	61 €	5 €
Belgium	15 €	16 €	- 6 €	101 €	103 €	62 €
Ireland	- 2 €	3 €	- 22 €	43 €	51 €	5 €
Finland	- 17 €	- 15 €	- 29 €	28 €	30 €	5 €
Portugal	33 €	20 €	50 €	88 €	62 €	118 €
Greece	36 €	49 €	65 €	84 €	107 €	137 €
Luxembourg	6 €	- 2 €	- 9 €	22 €	8 €	- 6 €
Hungary	19 €	14 €	63 €	48 €	39 €	128 €
Cyprus	13 €	- 5 €	- 4 €	32 €	- 1 €	1 €
Estonia	22 €	- 1 €	5 €	44 €	3 €	14 €
Czech Republic	13 €	20 €	62 €	39 €	51 €	128 €
Romania	40 €	26 €	161 €	78 €	53 €	300 €
Slovakia	19 €	7 €	34 €	42 €	19 €	69 €
Bulgaria	24 €	2 €	53 €	50 €	9 €	103 €
Slovenia	11 €	6 €	11 €	24 €	14 €	24 €
Lithuania	26 €	7 €	25 €	48 €	13 €	47 €
Latvia	23 €	5 €	17 €	42 €	9 €	32 €
Poland	58 €	86 €	291 €	109 €	161 €	536 €
Malta	19 €	2 €	3 €	35 €	3 €	6 €

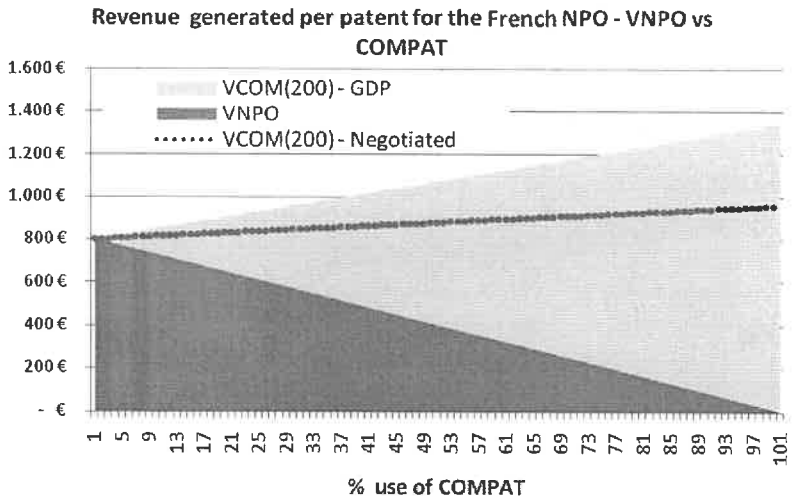
A.3. SIMULATED RENEWAL FEES' INCOME ACCORDING TO THE RELATIVE USE OF THE COMPAT

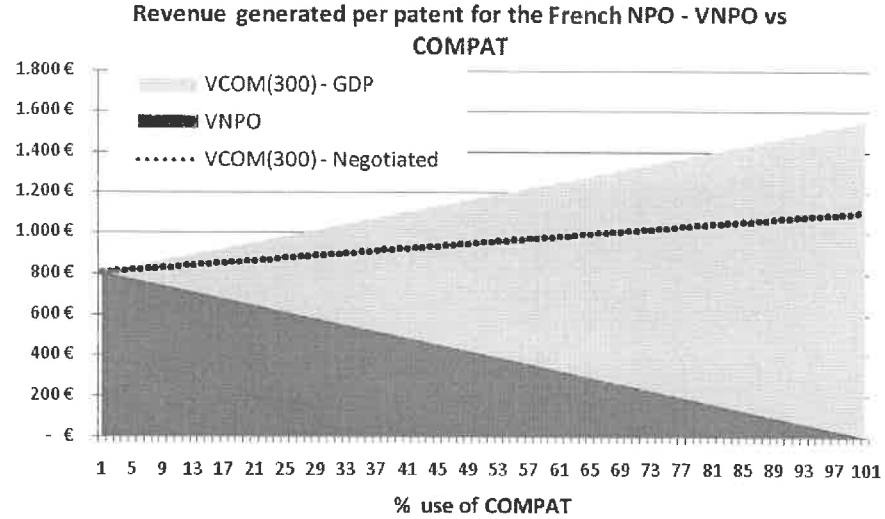


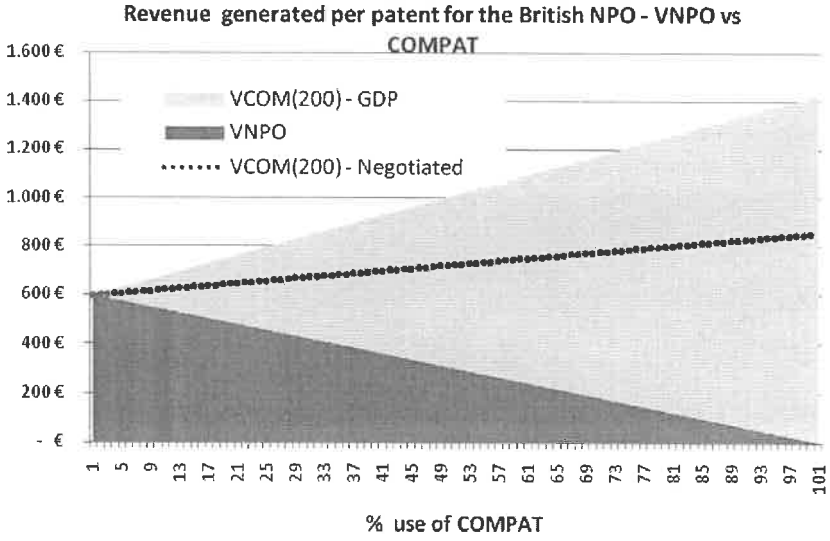


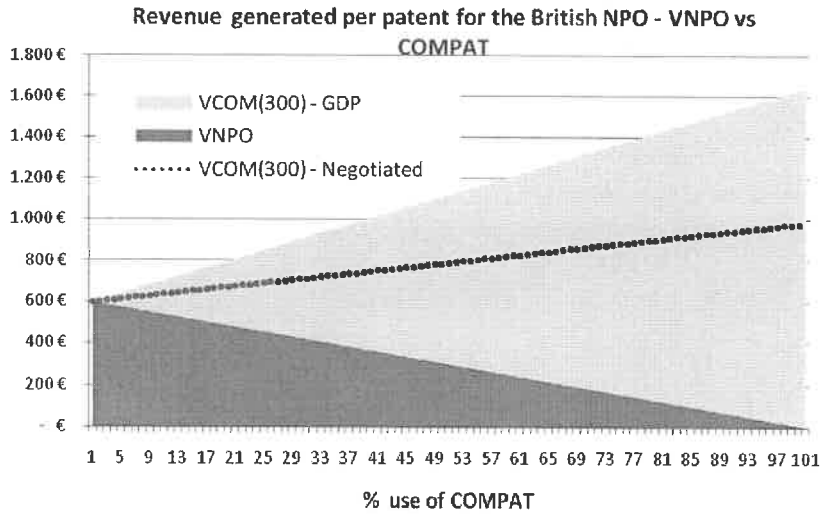


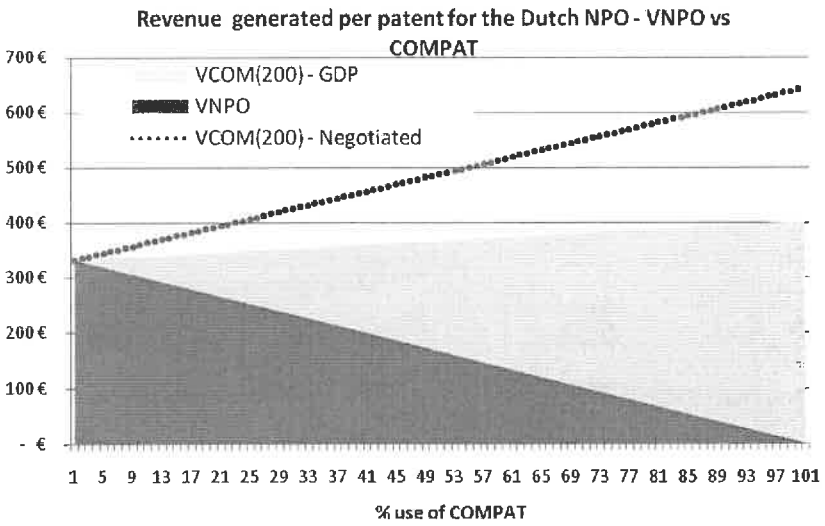


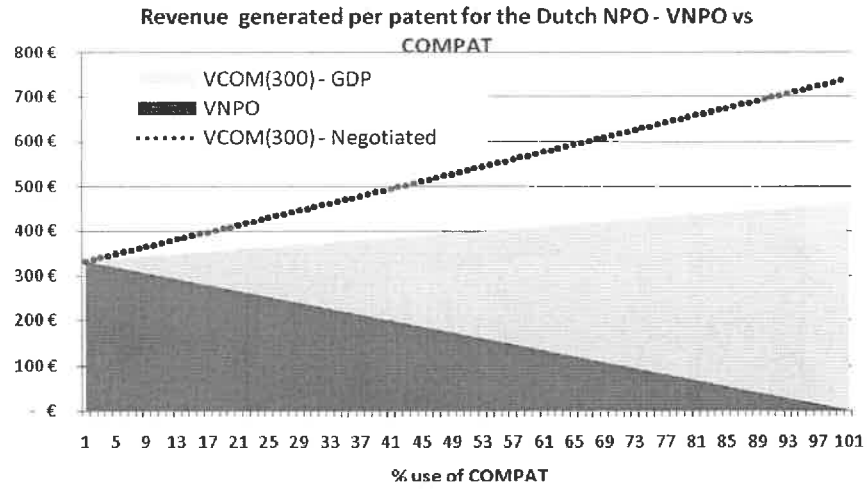

Revenue generated per patent for the French NPO - VNPO vs COMPAT
1.600 €
1.400 €
1.200 €
1.000 €
800 €
600 €
400 €
200 €
- €
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

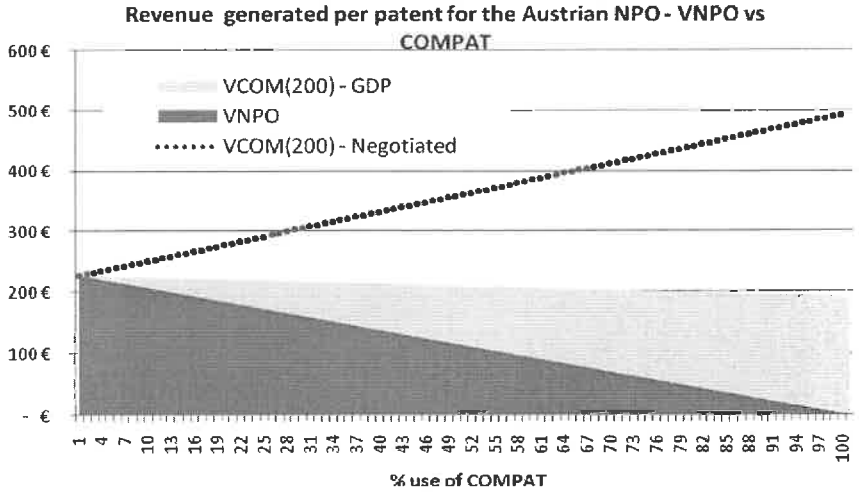

Revenue generated per patent for the French NPO - VNPO vs COMPAT
1.800 €
1.600 €
1.400 €
1.200 €
1.000 €
800 €
600 €
400 €
200 €
- €
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

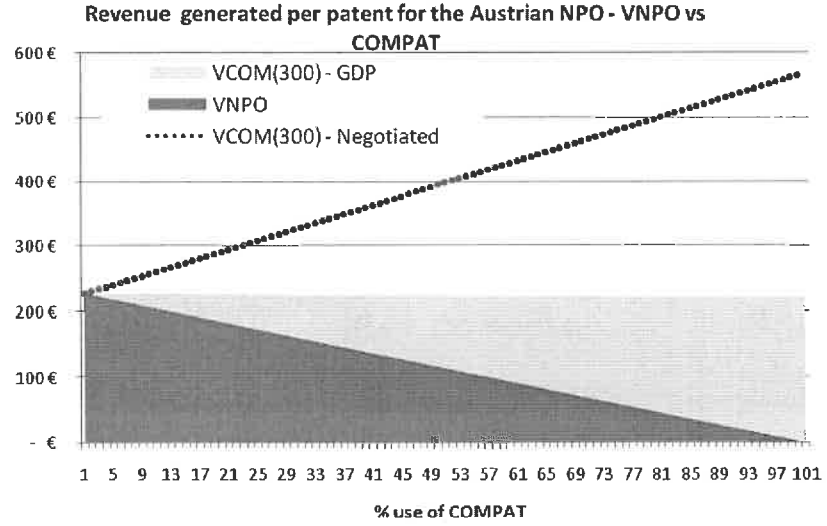

Revenue generated per patent for the British NPO - VNPO vs COMPAT
1.600 €
1.400 €
1.200 €
1.000 €
800 €
600 €
400 €
200 €
- €
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

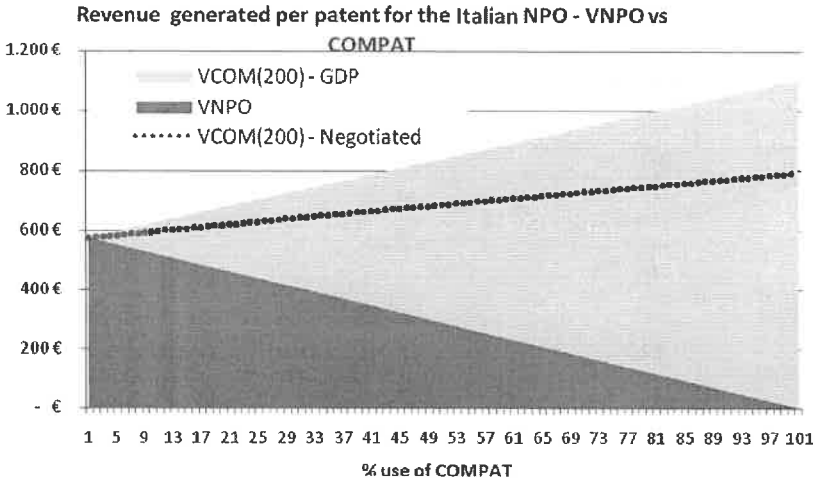

Revenue generated per patent for the British NPO - VNPO vs COMPAT
1.800 €
1.600 €
1.400 €
1.200 €
1.000 €
800 €
600 €
400 €
200 €
- €
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

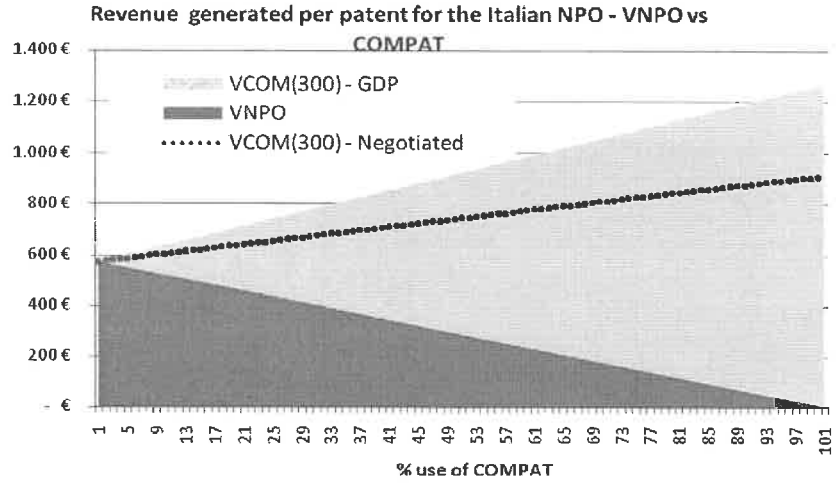

Revenue generated per patent for the Dutch NPO - VNPO vs COMPAT
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
700 €
600 €
500 €
400 €
300 €
200 €
100 €
- €
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

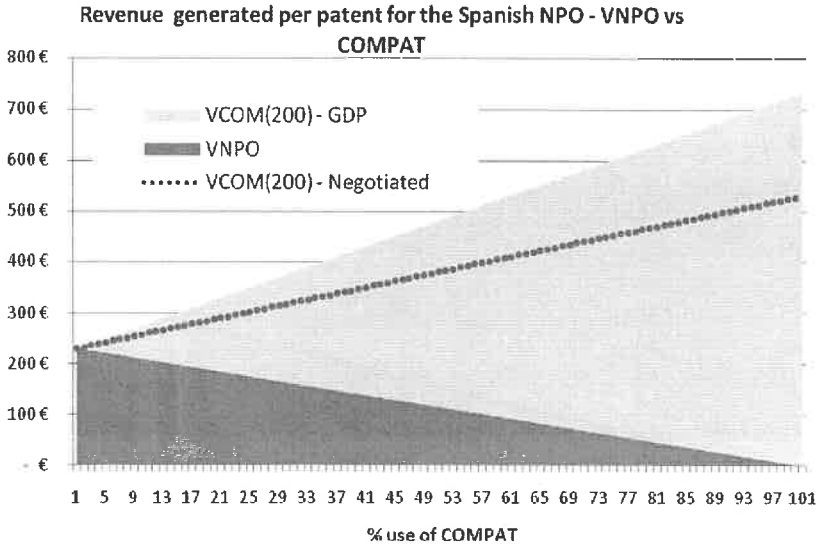

Revenue generated per patent for the Dutch NPO - VNPO vs COMPAT
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
800 €
700 €
600 €
500 €
400 €
300 €
200 €
100 €
- €
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

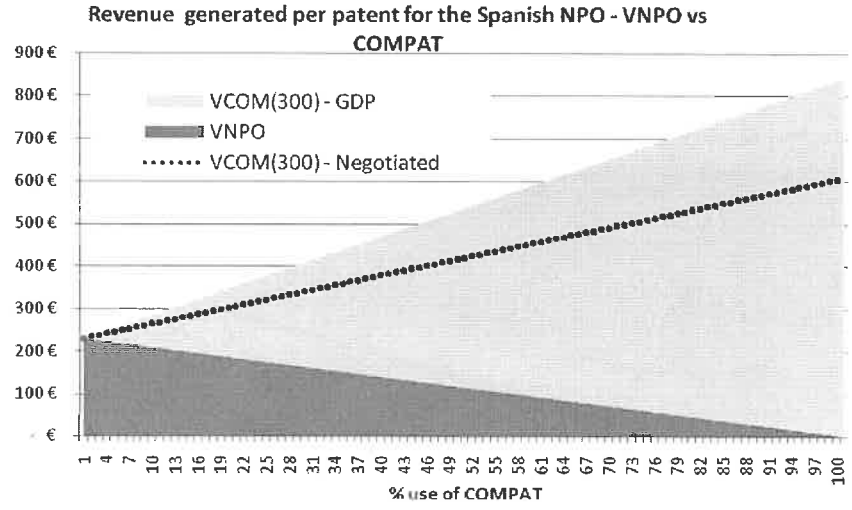

Revenue generated per patent for the Austrian NPO - VNPO vs COMPAT
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
600 €
500 €
400 €
300 €
200 €
100 €
- €
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
% use of COMPAT

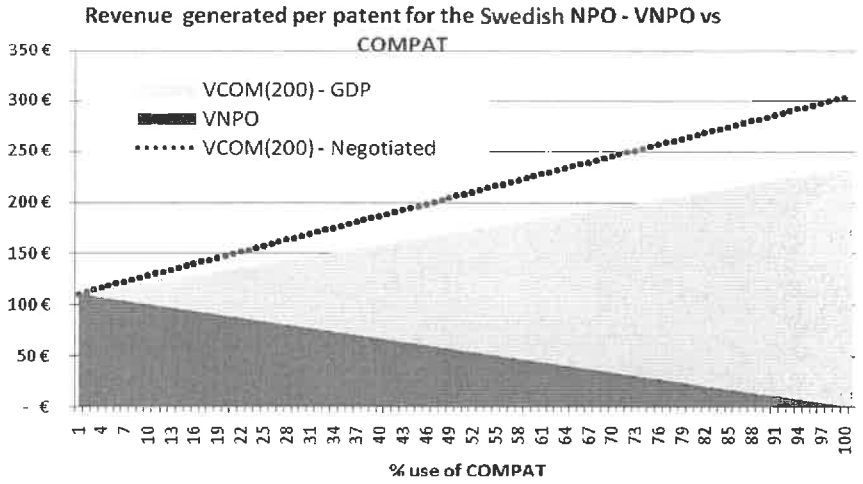

Revenue generated per patent for the Austrian NPO - VNPO vs COMPAT
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
600 €
500 €
400 €
300 €
200 €
100 €
- €
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

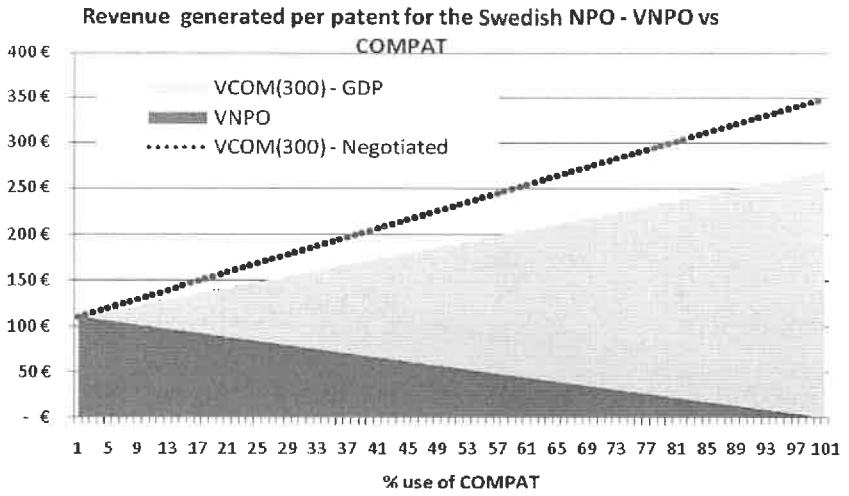

Revenue generated per patent for the Italian NPO - VNPO vs COMPAT
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
1.200 €
1.000 €
800 €
600 €
400 €
200 €
- €
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

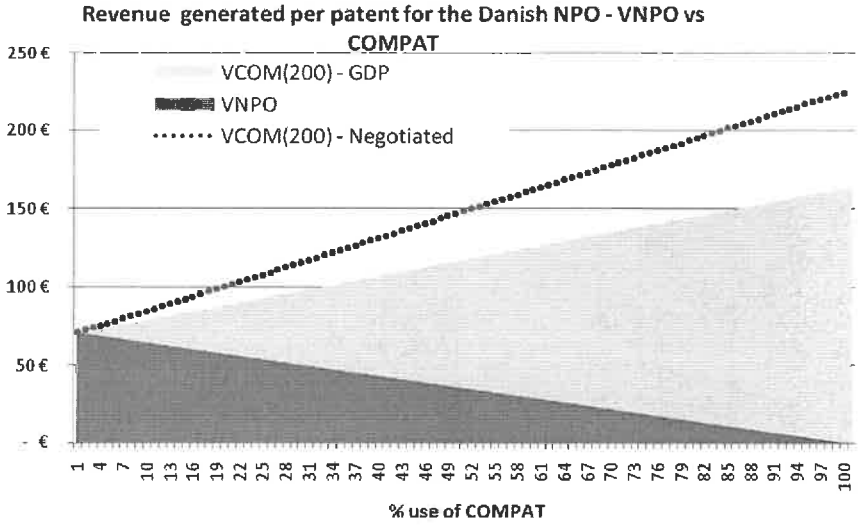

Revenue generated per patent for the Italian NPO - VNPO vs COMPAT
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
1.400 €
1.200 €
1.000 €
800 €
600 €
400 €
200 €
- €
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

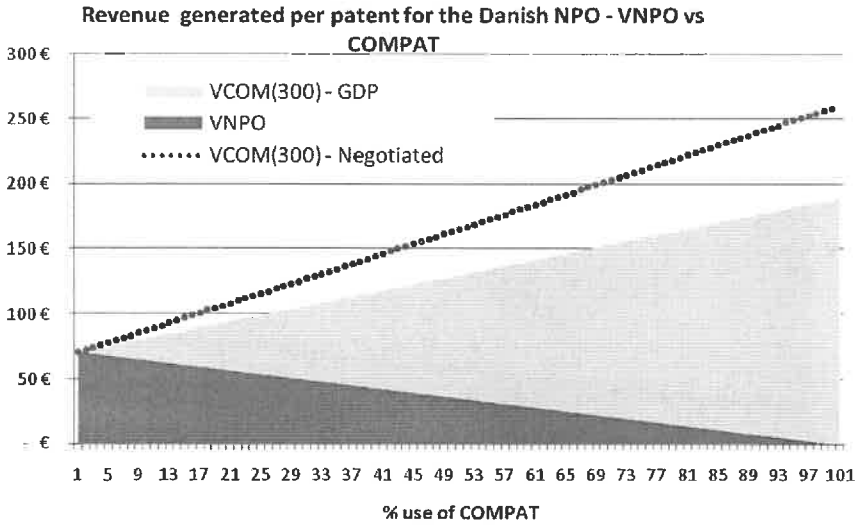

Revenue generated per patent for the Spanish NPO - VNPO vs COMPAT
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
800 €
700 €
600 €
500 €
400 €
300 €
200 €
100 €
- €
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

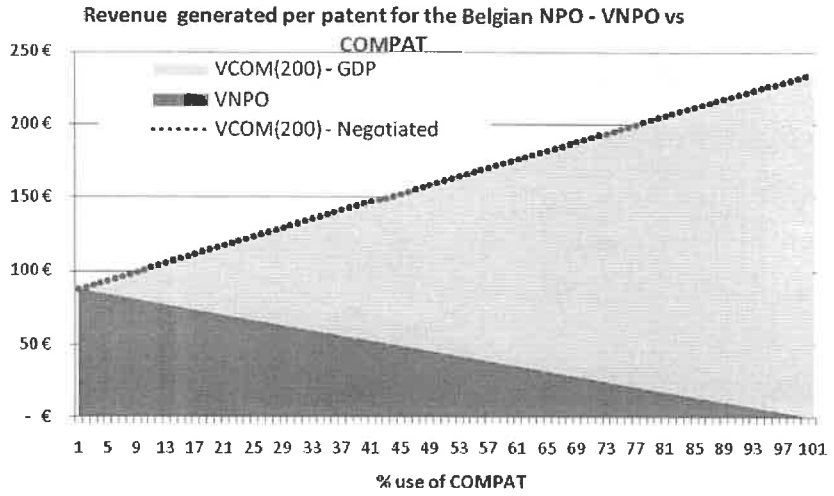

Revenue generated per patent for the Spanish NPO - VNPO vs COMPAT
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
900 €
800 €
700 €
600 €
500 €
400 €
300 €
200 €
100 €
- €
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
% use of COMPAT

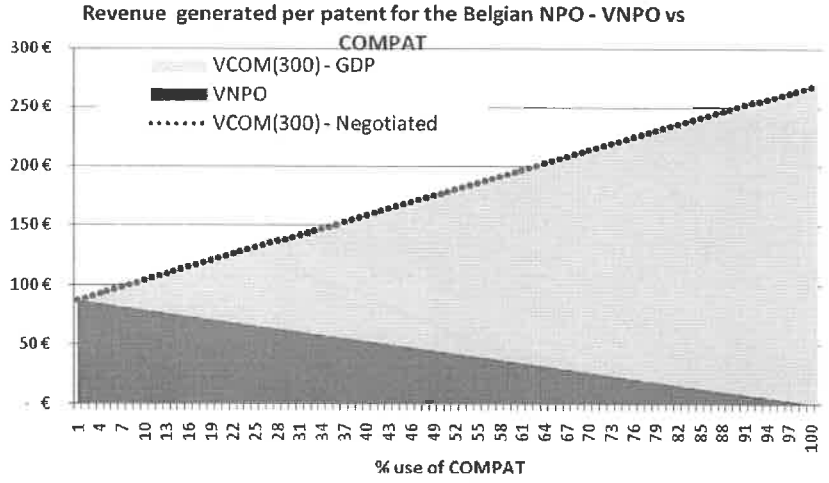

Revenue generated per patent for the Swedish NPO - VNPO vs COMPAT
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
350 €
300 €
250 €
200 €
150 €
100 €
50 €
- €
% use of COMPAT

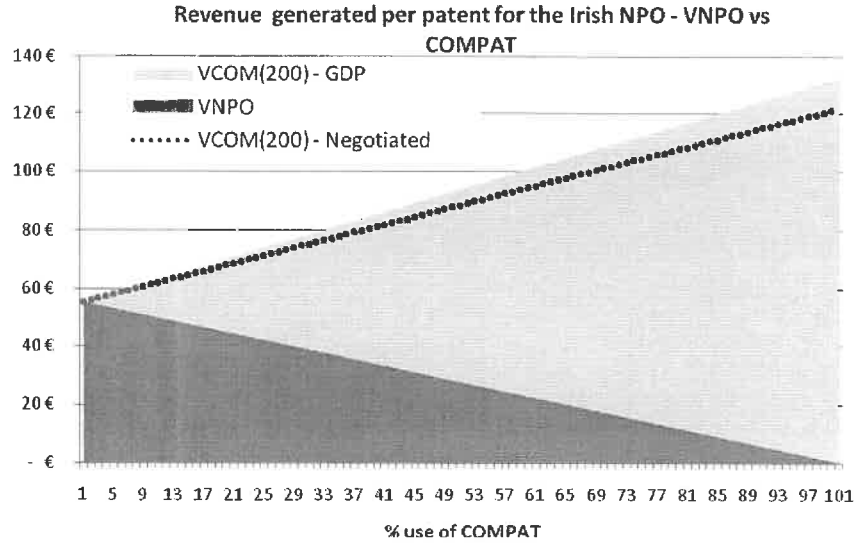

Revenue generated per patent for the Swedish NPO - VNPO vs COMPAT
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
400 €
350 €
300 €
250 €
200 €
150 €
100 €
50 €
- €
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

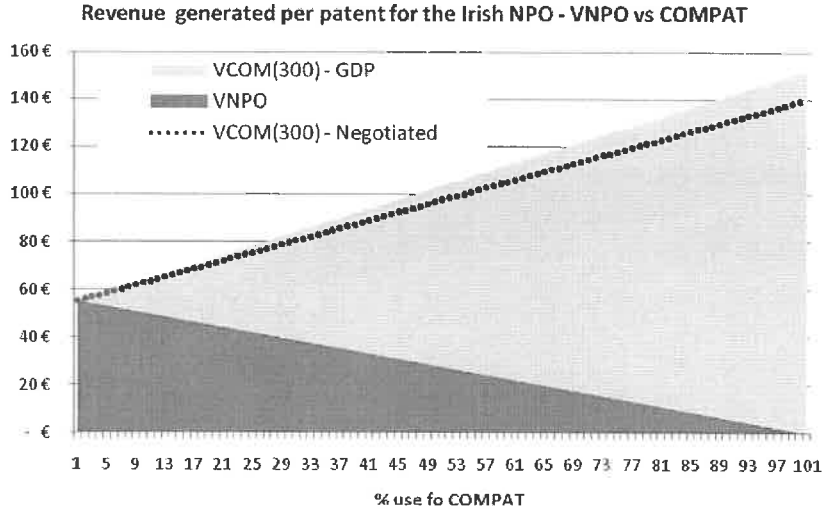

Revenue generated per patent for the Danish NPO - VNPO vs COMPAT
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
250 €
200 €
150 €
100 €
50 €
- €
% use of COMPAT

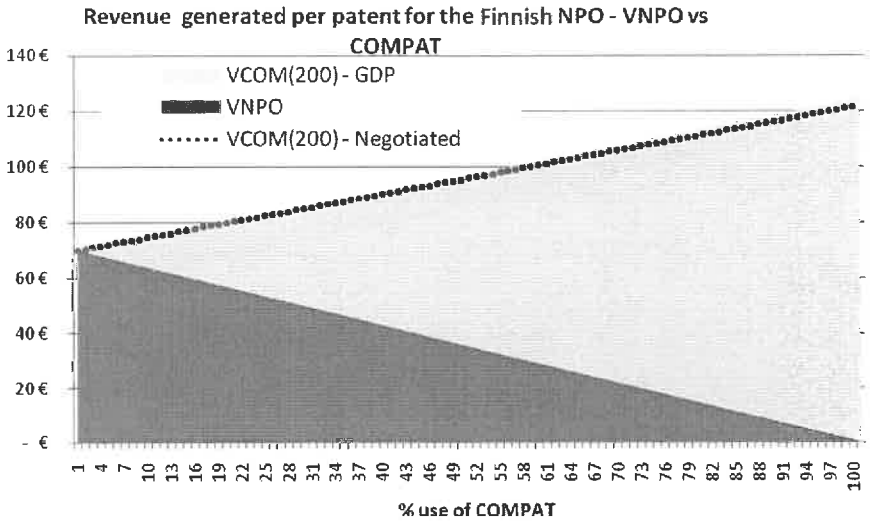

Revenue generated per patent for the Danish NPO - VNPO vs COMPAT
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
300 €
250 €
200 €
150 €
100 €
50 €
- €
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

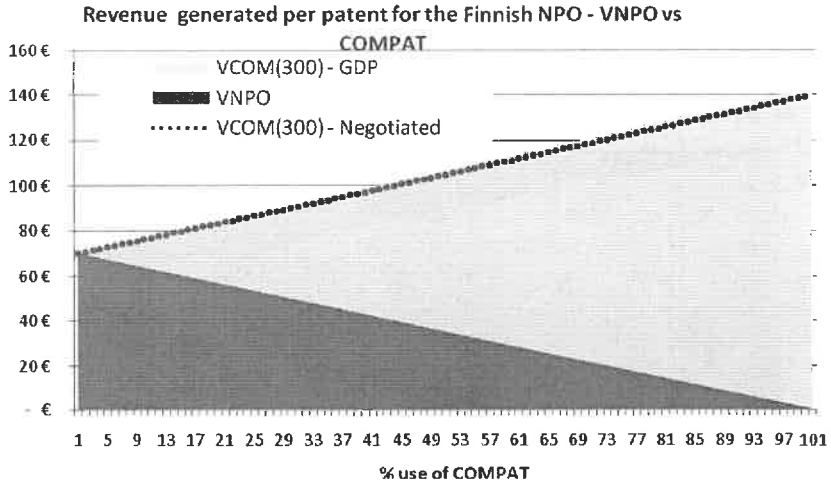

Revenue generated per patent for the Belgian NPO - VNPO vs COMPAT
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
250 €
200 €
150 €
100 €
50 €
- €
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

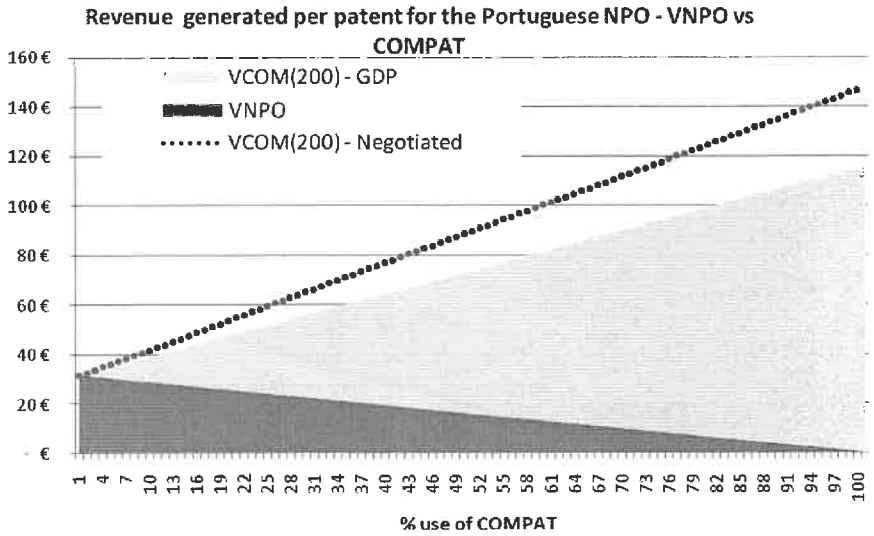

Revenue generated per patent for the Belgian NPO - VNPO vs COMPAT
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
300 €
250 €
200 €
150 €
100 €
50 €
- €
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
% use of COMPAT

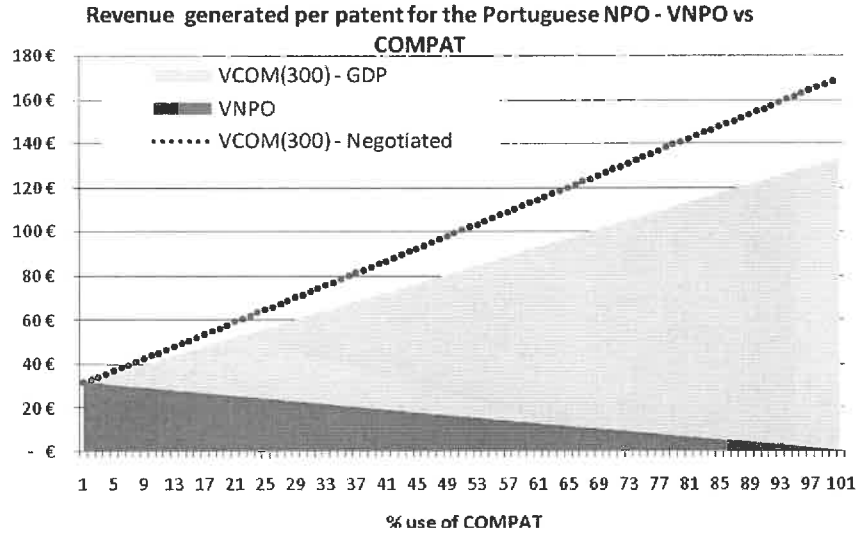

Revenue generated per patent for the Irish NPO - VNPO vs COMPAT
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
140 €
120 €
100 €
80 €
60 €
40 €
20 €
- €
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

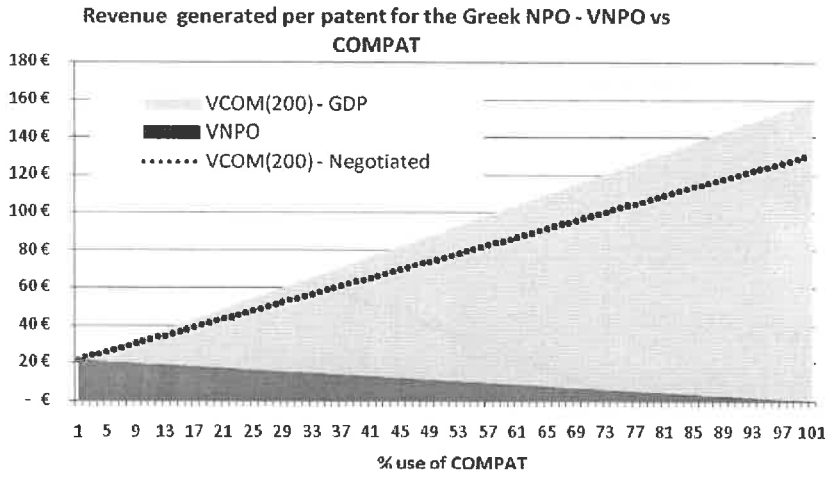

Revenue generated per patent for the Irish NPO - VNPO vs COMPAT
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
160 €
140 €
120 €
100 €
80 €
60 €
40 €
20 €
- €
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use fo COMPAT

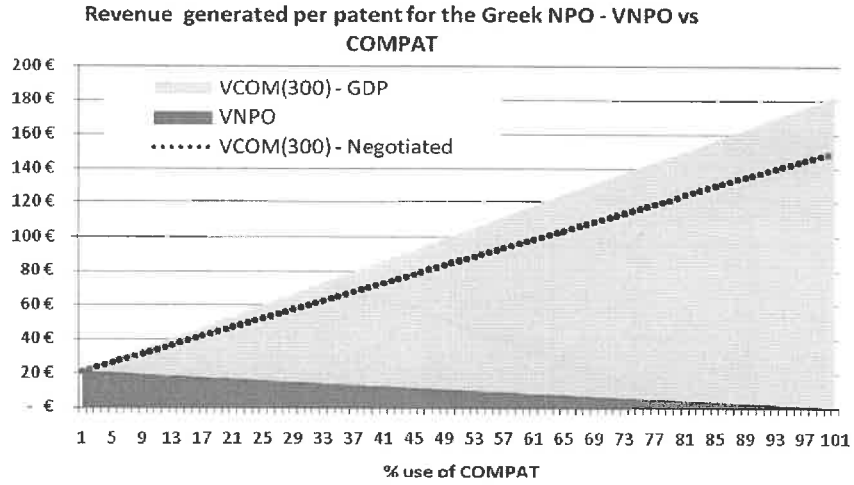

Revenue generated per patent for the Finnish NPO - VNPO vs COMPAT
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
140 €
120 €
100 €
80 €
60 €
40 €
20 €
- €
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
% use of COMPAT

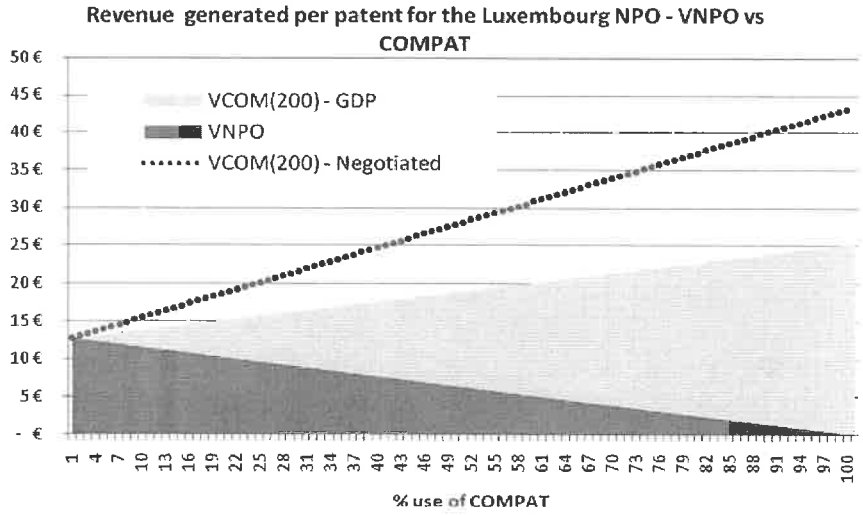

Revenue generated per patent for the Finnish NPO - VNPO vs COMPAT
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
160 €
140 €
120 €
100 €
80 €
60 €
40 €
20 €
- €
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

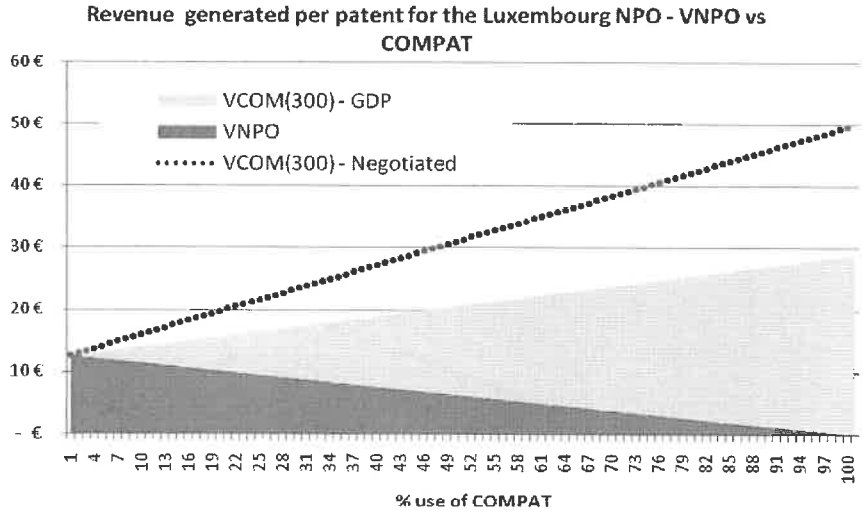

Revenue generated per patent for the Portuguese NPO - VNPO vs COMPAT
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
160 €
140 €
120 €
100 €
80 €
60 €
40 €
20 €
- €
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
% use of COMPAT

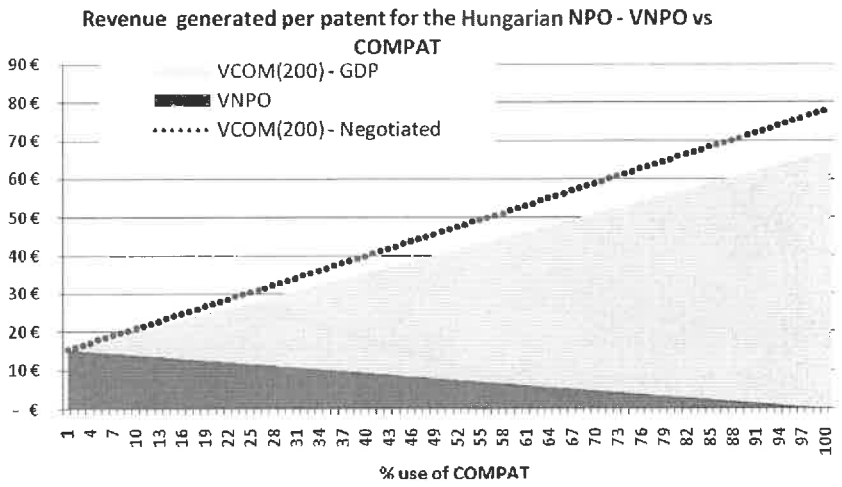

Revenue generated per patent for the Portuguese NPO - VNPO vs COMPAT
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
180 €
160 €
140 €
120 €
100 €
80 €
60 €
40 €
20 €
- €
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

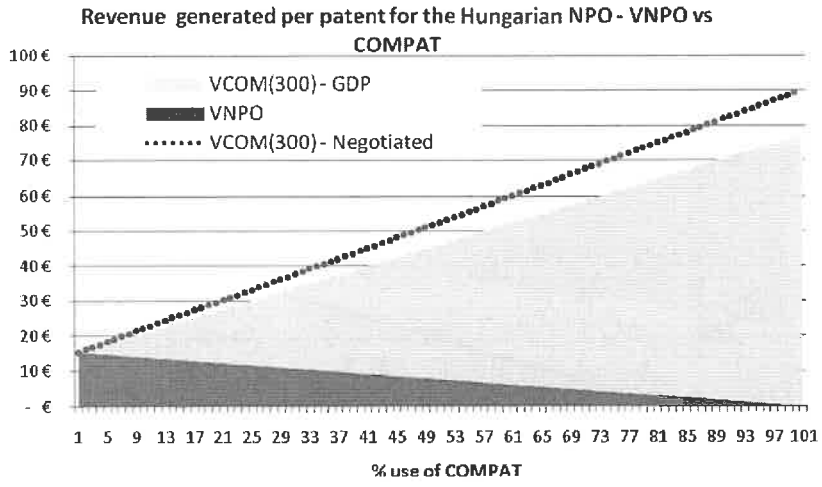

Revenue generated per patent for the Greek NPO - VNPO vs COMPAT
180 €
160 €
140 €
120 €
100 €
80 €
60 €
40 €
20 €
- €
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

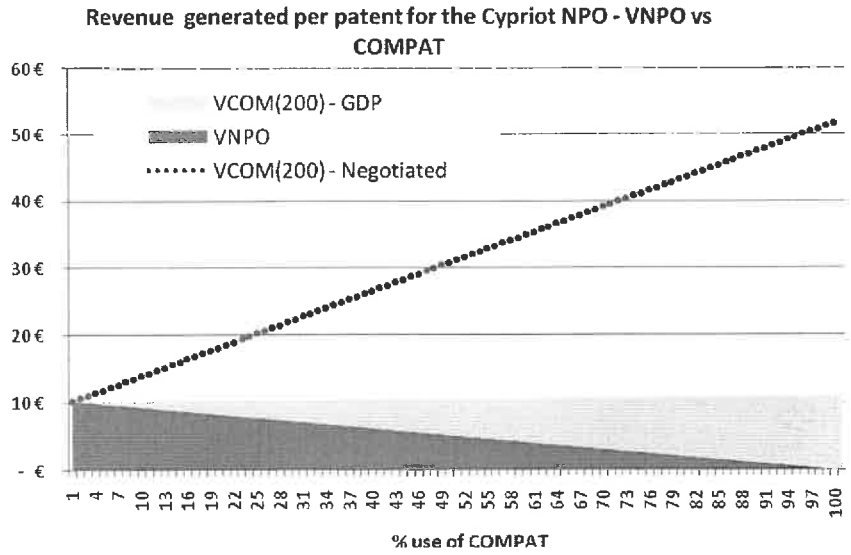

Revenue generated per patent for the Greek NPO - VNPO vs COMPAT
200 €
180 €
160 €
140 €
120 €
100 €
80 €
60 €
40 €
20 €
- €
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

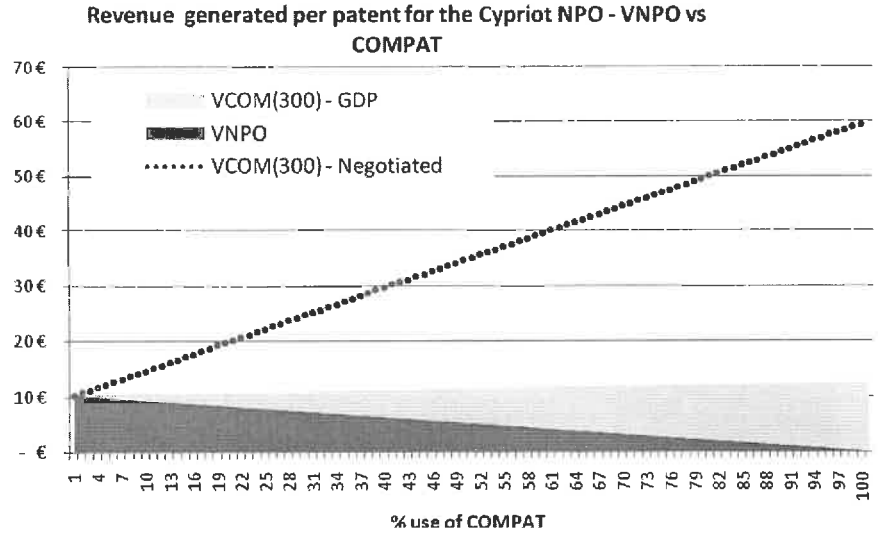

Revenue generated per patent for the Luxembourg NPO - VNPO vs COMPAT
50 €
45 €
40 €
35 €
30 €
25 €
20 €
15 €
10 €
5 €
- €
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
% use of COMPAT


Revenue generated per patent for the Luxembourg NPO - VNPO vs COMPAT
60 €
50 €
40 €
30 €
20 €
10 €
- €
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
% use of COMPAT

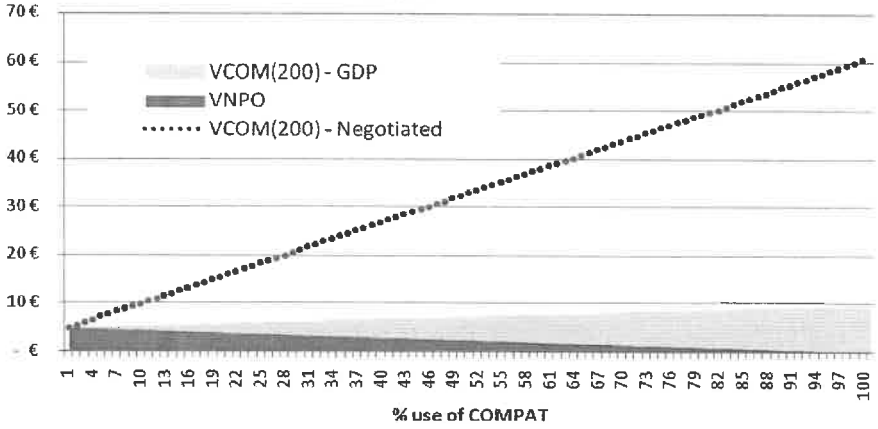

Revenue generated per patent for the Hungarian NPO - VNPO vs COMPAT
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
90 €
80 €
70 €
60 €
50 €
40 €
30 €
20 €
10 €
- €
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
% use of COMPAT


Revenue generated per patent for the Hungarian NPO - VNPO vs COMPAT
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
100 €
90 €
80 €
70 €
60 €
50 €
40 €
30 €
20 €
10 €
- €
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

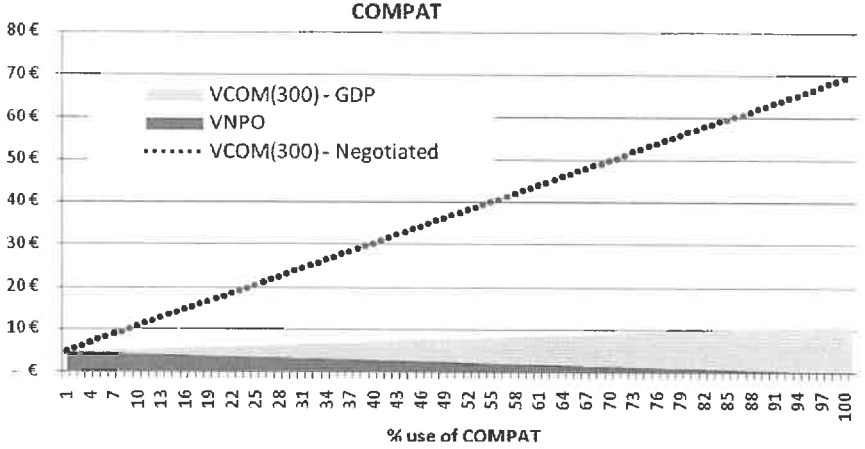

Revenue generated per patent for the Cypriot NPO - VNPO vs COMPAT
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
60 €
50 €
40 €
30 €
20 €
10 €
- €
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
% use of COMPAT


Revenue generated per patent for the Cypriot NPO - VNPO vs COMPAT
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
70 €
60 €
50 €
40 €
30 €
20 €
10 €
- €
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
% use of COMPAT

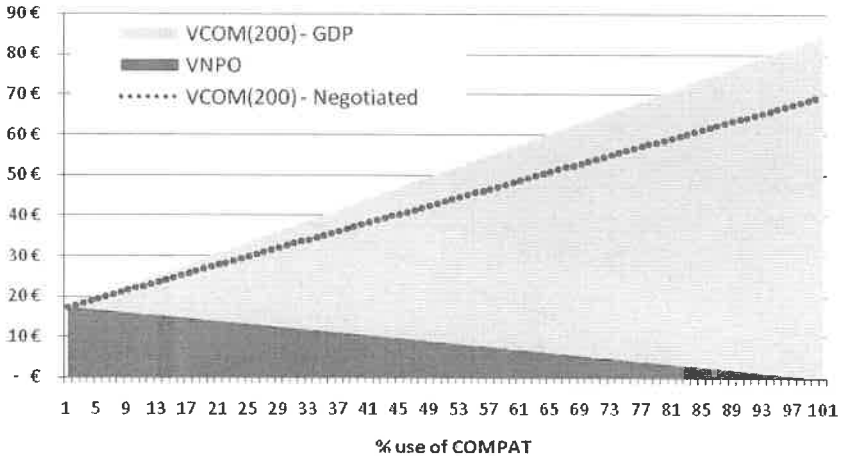
Revenue generated per patent for the Estonian NPO - VNPO vs COMPAT



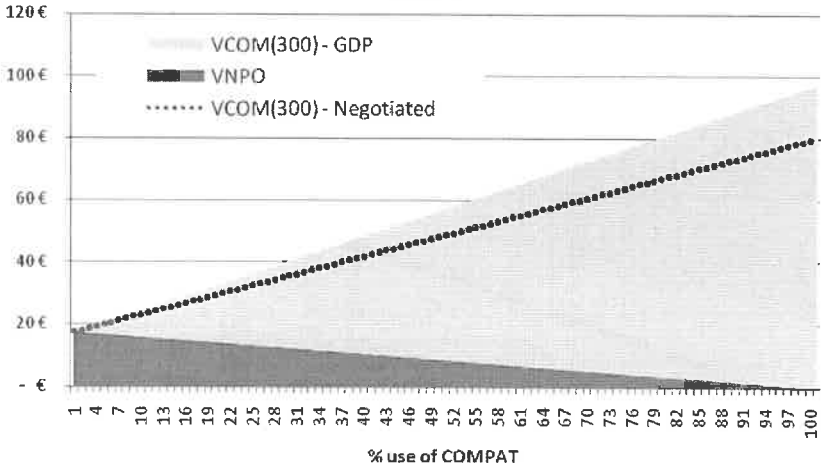
Revenue generated per patent for the Estonian NPO - VNPO vs COMPAT

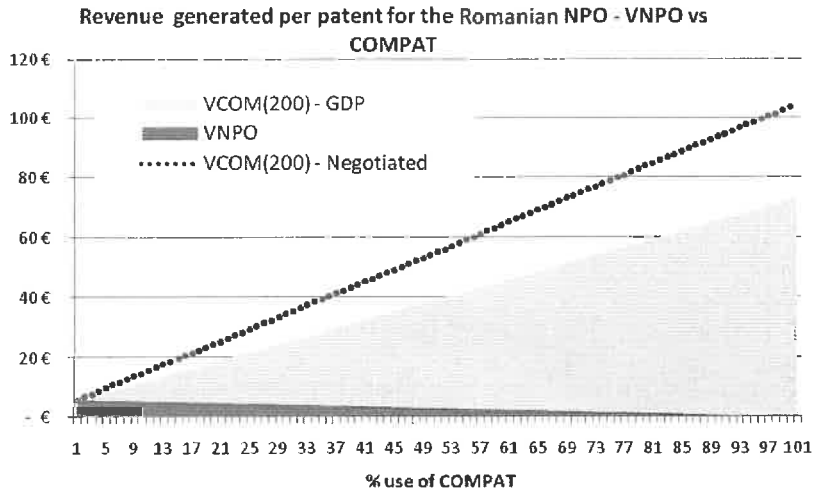


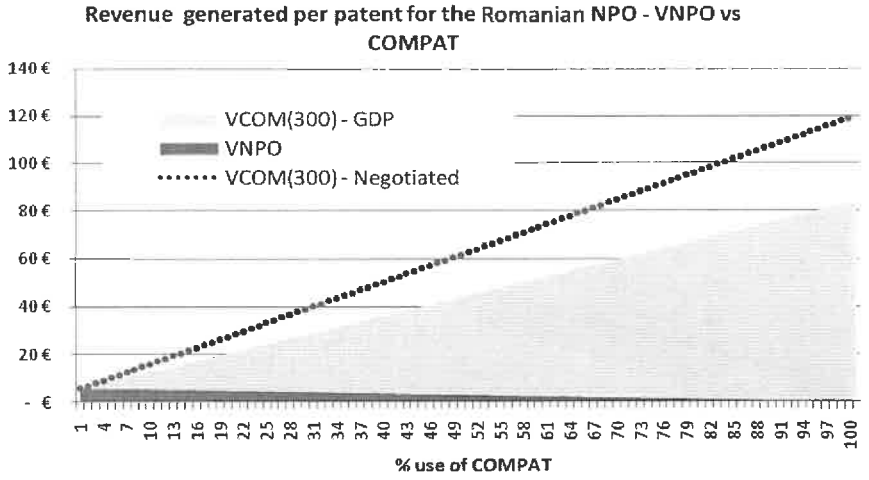
Revenue generated per patent for the Czech NPO - VNPO vs COMPAT

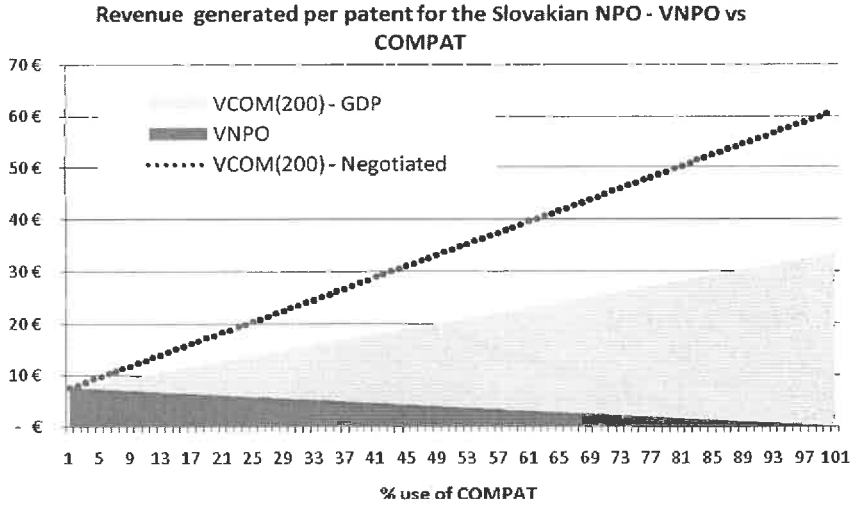


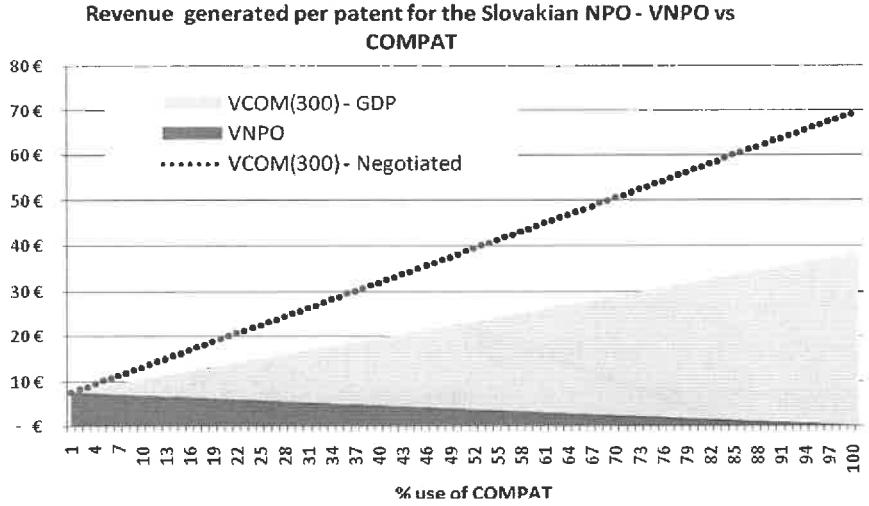
Revenue generated per patent for the Czech NPO - VNPO vs COMPAT

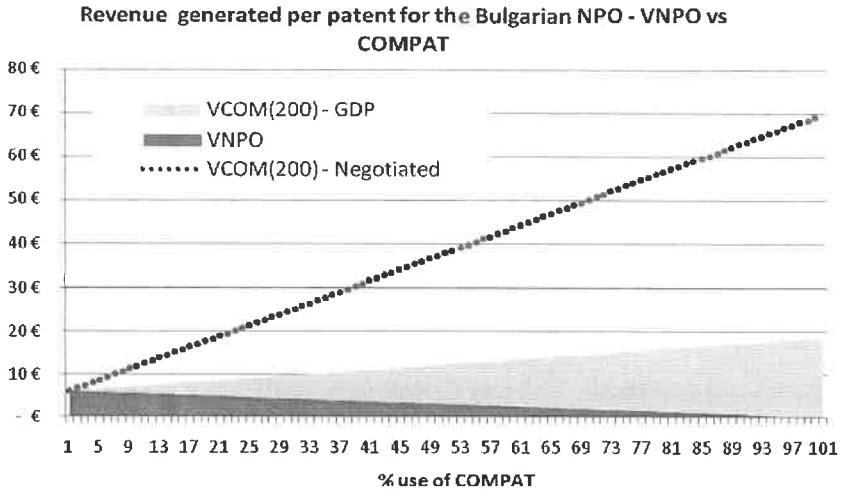


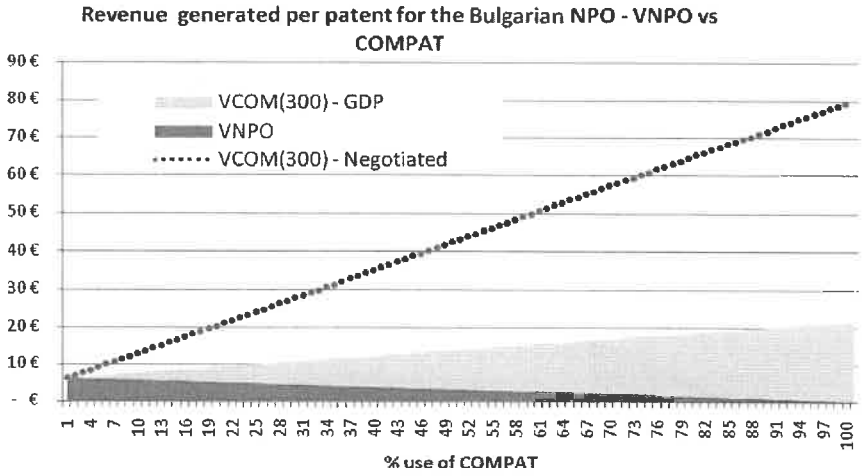

Revenue generated per patent for the Romanian NPO - VNPO vs COMPAT
120 €
100 €
80 €
60 €
40 €
20 €
- €
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT

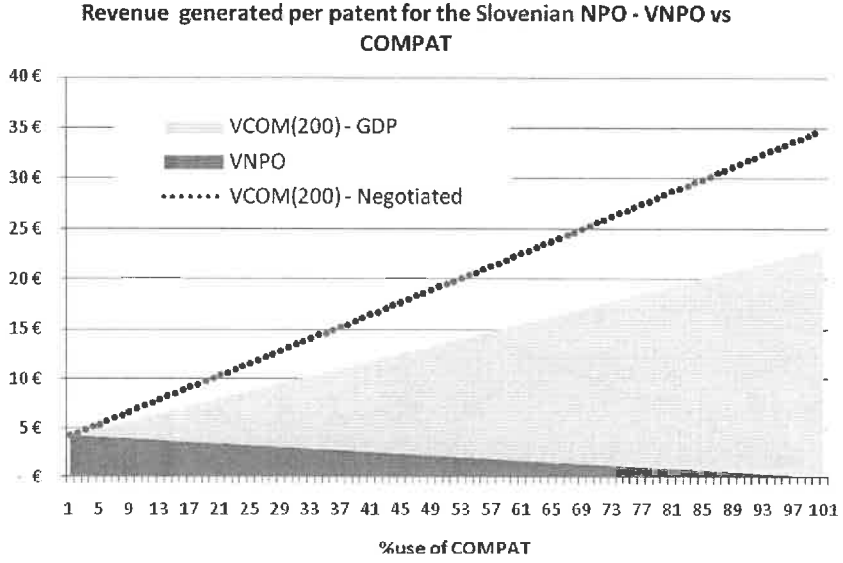

Revenue generated per patent for the Romanian NPO - VNPO vs COMPAT
140 €
120 €
100 €
80 €
60 €
40 €
20 €
- €
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
% use of COMPAT

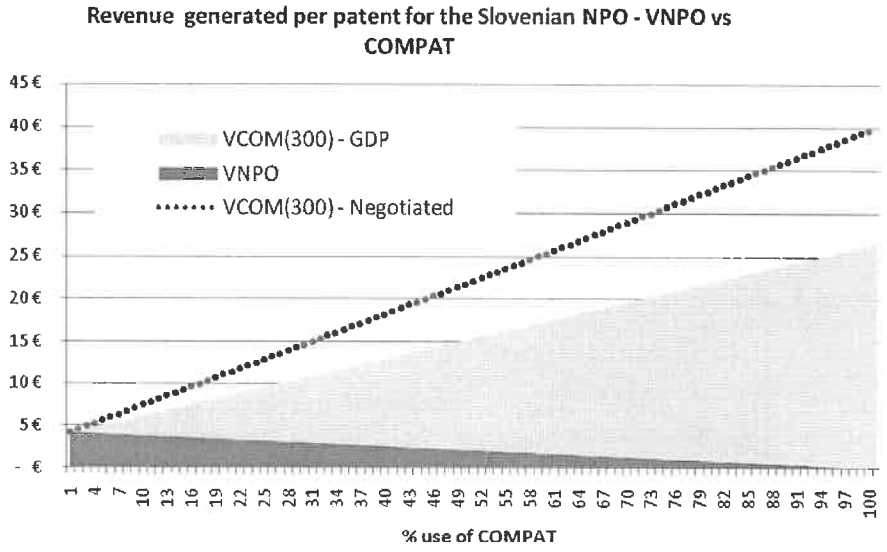

Revenue generated per patent for the Slovakian NPO - VNPO vs COMPAT
70 €
60 €
50 €
40 €
30 €
20 €
10 €
- €
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT


Revenue generated per patent for the Slovakian NPO - VNPO vs COMPAT
80 €
70 €
60 €
50 €
40 €
30 €
20 €
10 €
- €
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
% use of COMPAT

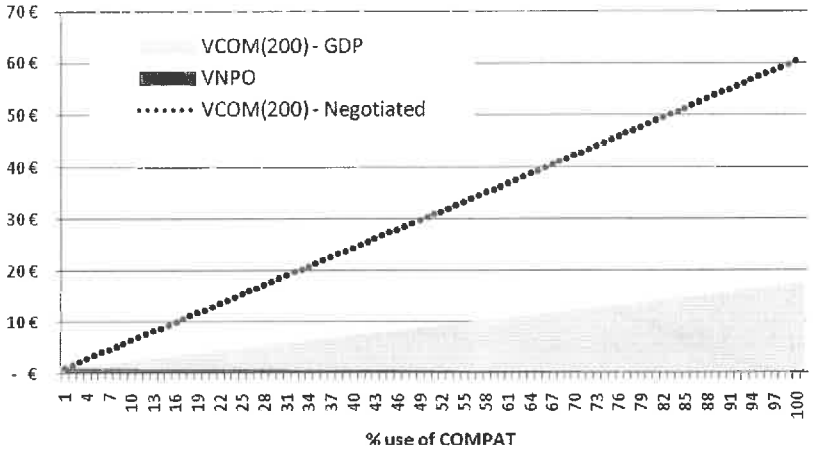

Revenue generated per patent for the Bulgarian NPO - VNPO vs COMPAT
80 €
70 €
60 €
50 €
40 €
30 €
20 €
10 €
- €
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT


Revenue generated per patent for the Bulgarian NPO - VNPO vs COMPAT
90 €
80 €
70 €
60 €
50 €
40 €
30 €
20 €
10 €
- €
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
% use of COMPAT

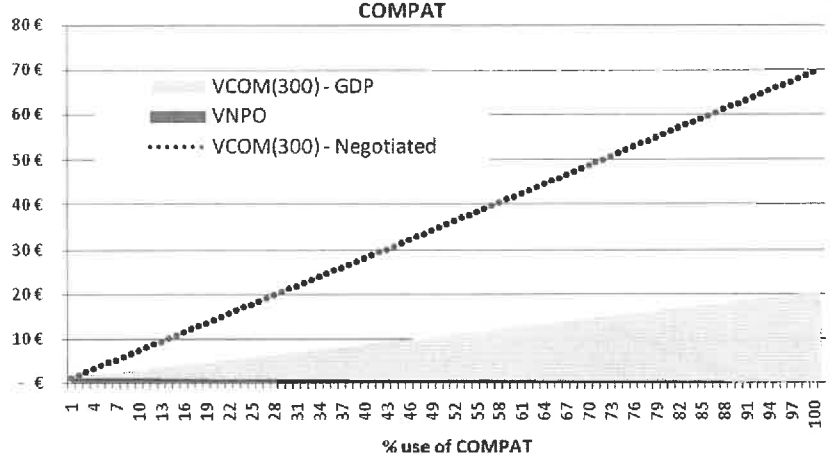

Revenue generated per patent for the Slovenian NPO - VNPO vs COMPAT
40 €
35 €
30 €
25 €
20 €
15 €
10 €
5 €
- €
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
%use of COMPAT


Revenue generated per patent for the Slovenian NPO - VNPO vs COMPAT
45 €
40 €
35 €
30 €
25 €
20 €
15 €
10 €
5 €
- €
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
% use of COMPAT

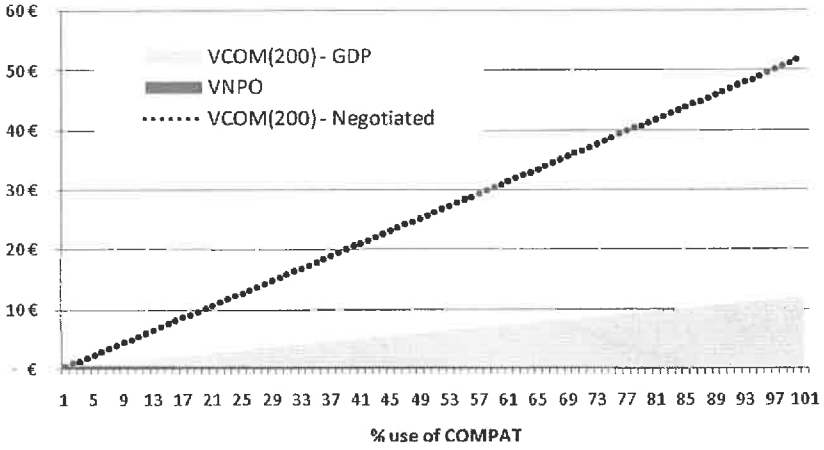
Revenue generated per patent for the Lithuanian NPO - VNPO vs COMPAT



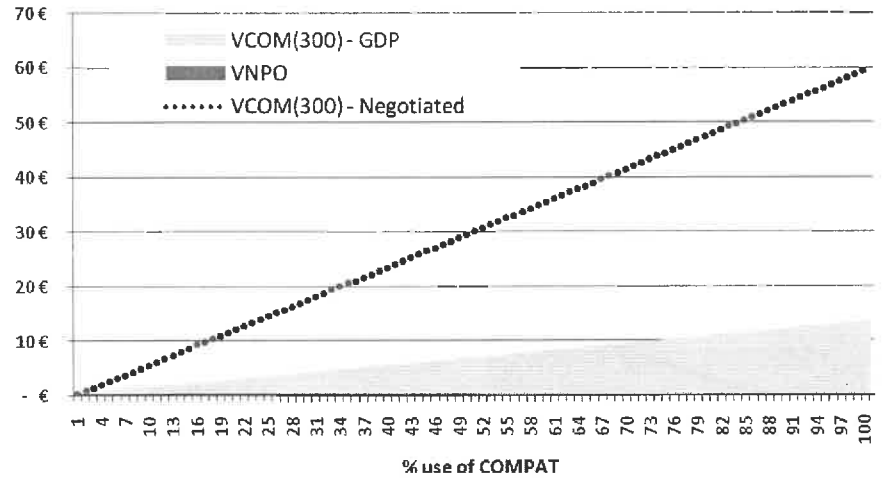
Revenue generated per patent for the Lithuanian NPO - VNPO vs COMPAT

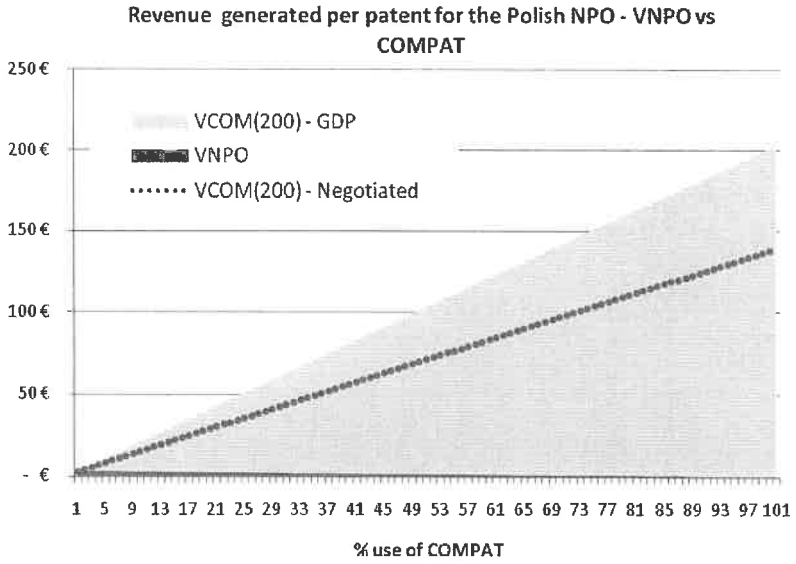


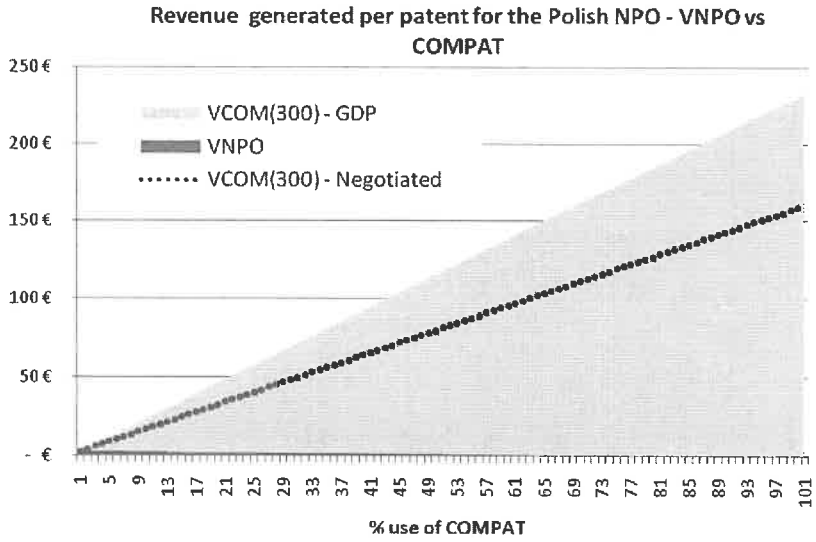
Revenue generated per patent for the Latvian NPO - VNPO vs COMPAT

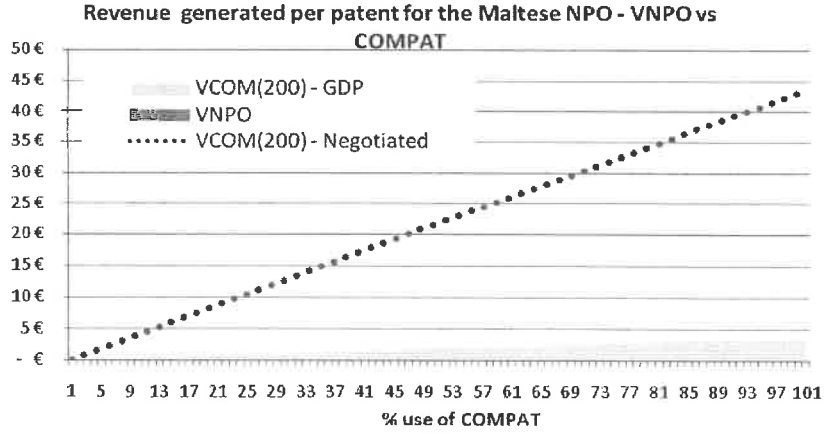


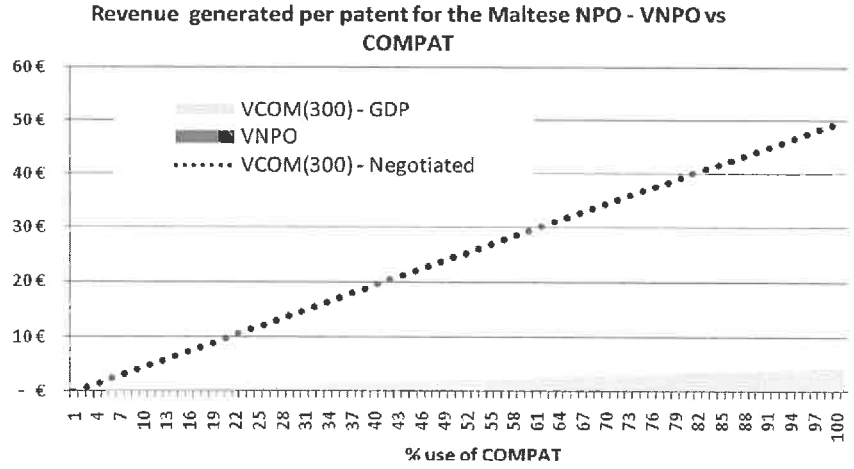
Revenue generated per patent for the Latvian NPO - VNPO vs COMPAT




Revenue generated per patent for the Polish NPO - VNPO vs COMPAT
250 €
200 €
150 €
100 €
50 €
- €
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT


Revenue generated per patent for the Polish NPO - VNPO vs COMPAT
250 €
200 €
150 €
100 €
50 €
- €
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT


Revenue generated per patent for the Maltese NPO - VNPO vs COMPAT
50 €
45 €
40 €
35 €
30 €
25 €
20 €
15 €
10 €
5 €
- €
VCOM(200) - GDP
VNPO
VCOM(200) - Negotiated
1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 101
% use of COMPAT


Revenue generated per patent for the Maltese NPO - VNPO vs COMPAT
60 €
50 €
40 €
30 €
20 €
10 €
- €
VCOM(300) - GDP
VNPO
VCOM(300) - Negotiated
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
% use of COMPAT