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**RESEARCH PAPER**

**The Impact of the European Patent system on SMEs and National States and the Advent of Unitary Patent[[1]](#footnote-2)**

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*A centralised and federal patent system in the EU changes economic and constitutional law structures by creating a ‘nationalised’ international patent. As the underlying economic policy has concentrated on the development needs of small and medium-sized enterprises (SMEs), accounting for 99% of all businesses in Europe, statistical analysis and data of their patenting activity and patent ownership are used to assess whether the new regime can help or hinder SMEs and the states in which they are based. Due consideration is given to the monopoly effect of patents and the adversarial nature of the judicial, federal system that is introduced in the absence of a federation of states. Although, generally, costs and benefits are inherent in such a system, objective evidence shows that the new legal/institutional developments amplify existing imbalances in technological and economic capacities that are already observed between and within member states, and between them and non-EU states in the current global conditions of technological competition.*

**Introduction**

We almost never hear any discussion of the costs of patent [...] monopolies, although these costs are almost definitional. (Baker, 2016, p.18)

In the period between mid-2011 and January 2013, EU organs and most of the EU member states negotiated and completed the European legislative acts and agreement for a federal patent system in Europe. This effort, which had often been attempted and had often been rejected for more than a generation, finally found fertile ground with the political paralysis that followed the recent and prolonged severe economic crisis which reached its peak in those years. This economic crisis is also relevant to the EU’s federal patent system in many aspects. It has exposed the EU’s economic currency system, the euro, for not having an effective control mechanism to deal with market failures, especially those caused by the EU’s internal market and, most importantly, it exposed member states for having surrendered vital powers of national sovereignty which have deprived the national state from effective resistance mechanisms and democratic control in such crises. In addition, the crisis has provided a reality test showing in the clearest way, what had already been known but not manifested, that after so many decades of continuous expansion of EU powers, there has not been much European integration, as national interests always prevail and the European partners have simply become strict creditors of other member states (See, e.g., Farrell and Quiggin, 2011; Erne, 2012; Mahnkopf, 2012; Leška, 2013; Varoufakis, 2015; Oltermann, 2015; Guzman, Ocampo and Stiglitz, 2016). This moment of truth has demonstrated that the continuous abolition and federalisation of national state powers, in the absence of a real federation, operating under the old, limited and anachronistic institutional design of decision-making structures of the EU, is a political oxymoron and paradox.

 Thus, on the one hand, national sovereignty is surrendered in the most important aspects of national independence and, on the other, economic losses that are caused by very unbalanced trade deficits and market failures within and beyond the EU’s internal market are not subsequently offset by a federal system where the continuous transfer of wealth from less developed to more developed states could have been redistributed to fund essential common systems, such as defence, fiscal sustainability, education, health and social welfare, R&D, etc. In the case of federalisation of the patent system, the situation is particularly serious because of its immense economic and technological importance, and its adversarial nature. It involves exclusivity in the use of technological inventions in almost all aspects of technology, when the latter is absolutely essential for the survival and sustainability of a wide range of state systems on which the people depend. More than that, unlike the euro, the EU’s institutional design for its new patent system is mainly founded around two international institutions – and hence beyond the direct control of the EU and the national states.

 The aim of the current study is to assess the economic impact of the new pseudo-federal/international patent system on national states. The national focus is appropriate because the only state that exists and the space where legal rights and obligations become a living experience is the national state. The national focus also has a pan-European dimension as far as European integration is concerned. This term, however, has become a buzzword that it is often cited and used without much explanation or in conjunction with the term ‘internal market’, which is frequently elevated to a sacrosanct objective and trump card without much elaboration (see, e.g., Ullrich, 2012; Jaeger, 2012). However, it should be stressed that integration is also political and can be undermined by the failures of the internal market – of which no one seems to speak – and, most importantly, by the lack of democratic control to deal with them. In this respect, European integration cannot possibly be achieved by a new system that increases substantially the existing, serious imbalances between member states and between them and the more developed, non-EU states (see patent statistics below).

 In contrast, a growing phenomenon of European disintegration has been observed in the sequels of the euro crisis which have created their own parallel universe of political dramas. Indeed, the most dramatic change in national politics has occurred in a good number of member states since the end of WW2: for instance, elected prime ministers have been replaced by former, national EU technocrats (Skelton, 2011; Hopkin, 2012; Muscatelli, 2018; Zielonka, 2018), ruling parties that have long dominated national and European politics have shrunk to a point of irrelevance,[[2]](#footnote-3) and the extreme right has acquired mainstream political status in coalition governments,[[3]](#footnote-4) or in opposition following democratic elections.[[4]](#footnote-5) As this is the new normal, political resistance weakens. The process of disintegration and of the widespread Euroscepticism that is associated with the growing expansion of the EU’s federal powers at the expense of national democratic control reached their nadir in 2016 when the British people voted to leave the EU. The UK’s exit from the EU is very serious, since the country and its people have long been the main and real force of European and global integration because of the indispensability of English language for communications between Europeans, access to information, and the openness of their influential educational system, which has become truly European.

 The creation of the new European patent system at EU level has taken place in a political landscape of growing and widespread realisation about the consequences of a continuous loss of national sovereignty, and in a period where global and regional institutional systems were already dominant. The EU’s new patent system, added to the denationalisation of essential state powers, multiplies that dominance substantially and in a vulnerable period, both political and economic. In addition, the negative consequences of the patent system exist by definition since patents are monopolies of industrial inventions. Indeed, the loss of sovereignty in the two areas of monetary currency and industrial property taken together (and without considering all other areas where national sovereignty has also been lost or substantially limited, such as state aid, competition policy and human rights), signals the emergence of zombie states, where democratic elections and powers no longer play any or much role in the most essential areas of the state’s business.

 EU organs have designed the ‘federalisation’ of the European patent system by upgrading and expanding the existing system of European patents that the international administrative organisation, the European Patent Office (EPO), grants and which are automatically nationalised as national property rights in the EPO member states chosen by applicants. The EPO’s institutional arrangement has long been seen as problematic as it allows property rights to enter national markets in massive numbers without adequate control and review of legal principles and economic policies that underlie - or ought to underlie - the determination of property rights (Borrás, 2006; Drahos, 2010).

 The founding fathers of the EU’s new patent system - the European Commission and a few developed EU member states - have not rectified the known democratic deficit surrounding the EPO system. Ironically, they reinforce it by placing it at the centre of their pseudo-federal project. For this purpose, two EU unitary patent regulations have been enacted that are directly applicable in all participant member states. [[5]](#footnote-6) By replacing in this way the current bundled system of a few EPO states, the influx of industrial property rights (as monopolies of industrial solutions, hereinafter, patent monopolies) in national markets increases from a few thousands to hundreds of thousands within a short period. The institutional design of the EU’s new system is accompanied by a new international court, the Unified Patent Court (UPC), that will exclusively enforce the EPO patent (with or without a unitary effect), creating a pseudo-federal system that is run mainly by international institutions, termed the ‘Unitary Patent Package’ (UPP).

 The current study has set, as its initial aim, an economic-legal analysis of the UPP by focusing on the cost of this new system. This focus is appropriate because, first, of the inherent adversarial nature of both the patent system and the new, judicial institution that is introduced and, second, the total absence in official EU studies and EU parliamentary debates of an evaluation of the consequences of the new system. Particular focus is put initially on the position of small and medium-sized enterprises (SMEs) in order to examine, subsequently, the degree of risk exposure of national states. In this respect, SMEs are a key focus of the current study not because they were used as policy targets in the EU official legislative texts, and in their communicative narratives and parliamentary debates, but because they are inextricably linked to the evaluation of the UPP’s impact on national states.

 One of the main reasons for the lack of an effective economic analysis by the EU organs was the non-examination of essential patent data and statistical information that would enable an objective appreciation of the UPP’s impact. For this purpose, the first part of the current study is devoted to identification of relevant statistical information and data with particular focus on the years close to the critical time of the UPP’s conclusion at EU level. An economic analysis will follow in the second part of the study to explain the various imbalances that are already observed among various economic actors and between member states and the more technologically developed non-EU states. It will subsequently be discussed how the current unbalanced situation will be affected by the UPP.

The initial aim for an economic-legal analysis has to be expanded by involving a political approach in the discussion because the new system forces the total and permanent abolition of national control in this crucial area – a situation that has no precedent in the political

history of independent states of the world. The wider economic implications of the UPP’s unconstitutional design, rather than just its legal and constitutional characteristics, will be considered. In view of the fundamental constitutional problems in the UPP’s design, what is also tested is the lack of democratic safeguards that expose both the EU organs and most importantly, the democratic organs of national states. It is also observed that, although the political paralysis that has followed the severe economic crisis gave the EU organs the opportunity to promote the UPP, recent events and actions have shown that expert opinion and institutional reflexes are waking up at national level, albeit with a very considerable delay. The recent reaction of some states can be observed in the very slow ratification of the UPC Agreement at national level, the constitutional rejection of the UPC Agreement in Hungary, and the waking up of law societies. Notable is the democratic paradigm of a specific state which rejected the UPC Agreement when it was passing the EU legislative stages (not *ex post*) because it had produced its own, national study showing that it would be worse off under the new patent system. The main problem is not the UPP as such, but the expert opinion, both national and European, which increasingly comes from a few private consultancy agencies and foreign research centres (such as the Max Plank institute) whose *modus operandi* excludes, consistently and deliberately, the vital interests of a great number of national states. This also begs the political question of how it is ever possible for national sovereignty to be surrendered without prior impact assessment at national level.

 Mancur Olson (1982, p.26) has pointed out that democracy suffers because of the ‘imperfect knowledge’ of citizens who are not aware of various important measures and policies that are introduced. Either citizens participate in studies of major EU decisions involving loss of national sovereignty in areas such as industrial properties, or studies will be provided by indifferent, foreign experts who may advise the surrender of national sovereignty and who are unable and unwilling to examine the impact on national states. The same caveat applies to the current study. The main focus of the current study is on economic and legal problems surrounding the UPP. However, its institutional design and the way it was imposed, as well as its recent, more critical treatment by some national states, reveals the use and abuse of expert opinion in democratic decision-making (Xenos, 2014b). Problems identified in this process expose the entire political system and its democratic structures.

***Ex-post* only statistical evidence: focus on SME patenting activity**

The political-economic focus on SMEs’ interests is particularly noted in the official UPP documents,[[6]](#footnote-7) parliamentary debates and voting sessions (Xenos, 2013, p.269) and has consistently and repetitively appeared in the all relevant EU communications and reports of both the pre and post-legislative period.[[7]](#footnote-8) However, it is manifestly absent from the EU’s official pre-legislative assessment studies of UPP that were carried out by Harhoff (2009) and the European Commission (2011). In the adversarial context of monopolies and especially of patents, the essential evaluation of economic impact cannot be secured without prior access to patent data of economic actors and states so as to estimate the costs and benefits involved. How has such a major institutional project passed all main legislative stages and pre-legislative studies and debates at EU level (including national scrutiny) when such objective and essential evidence was excluded?

 The first part of the current study presents statistical results of EU studies which appeared only *ex post facto*; that is, after the official setting up of UPP had already been concluded at EU level. However, as these studies have a narrow scope, we have undertaken additional statistical research of SME patenting activity (i.e., of granted patents), including corresponding national shares. National impact is rarely taken into account in EU studies, whose practice is constantly and increasingly based on aggregate numbers – as if the EU was a federation of states (Xenos, 2013, notes 40-1). As a result, what is usually missing from EU studies is any evaluation of the national impact and risk exposure relating to the UPP. What is more, the EU’s official, *ex post* statistical patent studies devote not a single reference to the UPP – a typical EU practice that has long made clear to all interested parties, lobbyists and powerful players how policy and decision-making actually operates in the EU. In contrast, the evaluation of patent statistics in relation to the existing patent system and the new changes that the UPP introduces is the main aim of this study.

 The general position of SMEs can be identified by key statistical information in the 2015 study of the EU’s Intellectual Property Office (EUIPO),[[8]](#footnote-9) which found that the percentage of all EU-based SMEs owning a least one patent is 0.8% (EUIPO, 2015, table 8, p. 40). It is clear that the monopoly effect of patents does not help the vast majority of SMEs (Hughes and Mina, 2010). This is also shown by their extremely low presence, 0.5%, in their national base.[[9]](#footnote-10) Where the competing environment is stronger, as is in the EPO system, patenting SMEs account for just 0.1%. In the post-UPP period, it is the EPO system which becomes dominant because of the unitary effect of the EPO patent. Bearing in mind this general picture, more specific aspects of patent data and statistics should be looked at with focus on the EPO system.

**SME share of European patent applications**

Some months after the UPP had officially been concluded at EU level, the EU, through its statistical office, Eurostat, published a study of the SME share of European patent applications. The study was carried out by external contractors, the research centre of only one university in collaboration with a consultancy firm (Eurostat, 2014, p. 4). The Eurostat contractors’ study does not mention standard methodological information, such as the exact size of samples or whether the financial databases used contained data about the SME definitional criterion of employee headcount. The Eurostat timeframe is the period 1999-2011, which includes the period 1999-2003, before the EU’s major enlargement with ten new states, and excludes the years 2012 and 2013 of the post-2008 economic crisis. As a result, the study did not take into account the consequences of the economic crisis: “SMEs’ innovations also suffered, as did *patent applications”* (European Commission, 2015, p.68, emphasis added). The focus of the study is on patent applications, which has both advantages and disadvantages. On the one hand, patent applications show potential and presence in innovative industrial activities in patent-dependent sectors and, more importantly, the data remain unaffected by the EPO’s ever-changing administrative and management policies and practices (e.g. recent staff recruitment resulted in a sudden increase in granted patents).[[10]](#footnote-11) On the other hand, applications do not accurately show industrial property ownership and actual innovative contribution as around half of patent applications are rejected.

 The study of Eurostat’s contractors estimates, within a margin of 5% statistical error, that 17.6% of all European patent applications are made by EU-based SMEs and 78.9% by large companies (Eurostat, 2014, table 11, p.36). These findings point to very low patenting activity by SMEs compared with that of large companies and corporations, which dominate clearly patent activity in Europe.

 The Eurostat results can be contrasted to the percentages that the EPO announced in the same period. For patent applications in year 2013 (the UPP setting-up period), the EPO’s website states that the share of large firms was 65.5%, compared with 29% for SMEs and 5.5% for universities and public research. The EPO’s percentage can only involve a higher number, as they do not distinguish between EU and non-EU-based SMEs in their statistical announcements. It should be noted that the EPO’s occasional announcements of SME shares are not accompanied by any information of their methodology – an established professional standard in statistical studies that is required in the interests of transparency and reliability of results (Arrowsmith, 2014; Moody, 2016).

 Eurostat also provides data for per country estimations of the proportion of SMEs in European patenting activity of all nationally-based companies. These are only indicative percentages as their sampling methodology focuses on the EU’s overall proportion. In particular, SME shares in European patent activity of all nationally-based companies include: Germany (10.3%), Finland (13.2%), Denmark (27.6%), UK (35.3%), Italy (37.1%), Bulgaria (53.8%), Poland (34.0%) (Eurostat, 2014, p.36). These percentages indicate the degree of a state’s dependency on patenting SMEs that justifies the examination of the UPP’s impact on national state through the prism of SME patenting activity.

 The Eurostat study does not attempt to make any evaluation of its results in relation to the UPP, which appears nowhere in the entire text. Notable is the affirmation from the outset of “SMEs’ contribution in developing technology and high R&D productivity” (Eurostat, 2014, p.3), which assumes the very point being assessed. Under this benefits-only approach typical of EU institutions, any patenting percentage of SMEs is always presented as good, as it always reflects a contribution to technological development and the economy.

**SME share in European patents**

The scope of Eurostat’s study of patent applications is legitimate, but does not reflect accurately the SME share in actual patents granted at the European regional level. The decision to conduct our own study is justified on two further grounds. First, it is in the interests of transparency and accountability to check the findings of official EU studies. Second, the methodology that the Eurostat’s contractors adopted is particularly complex and obscure, partly because of its main focus on the third criterion of the SME definition, namely a company’s autonomy/independence, which is inherently complex and difficult to establish – as the European Commission (2017) admits (see Centre for Strategy and Evaluation Services, 2012).[[11]](#footnote-12) As oversight of official studies is essential for democratic control, an obscure methodology and heavy reliance on very expensive private databases exacerbates the complexity of the subject. If important statistical studies are carried out exclusively by contractors of EU institutions, the policy and decision-making process will be fed (and controlled) by the very organisations whose work must be reviewed and held to account. Thus, a key aim of this section is to simplify the methodology on SME statistical studies to encourage participation in the scrutiny of EU policies and studies, especially in the crucial pre-legislative stages of the decision-making process.

 From the three definitional criteria the EU uses - a) employee headcount, b) limits to annual turnover and balance sheet total, and c) autonomy - the focus can be put on the first criterion. The Commission repeatedly affirms that this “must be observed as the main criterion” (European Commission, 2003, recital 4). The second criterion is often satisfied where the first one is met as they reflect interconnected business dynamics. This is also reinforced by the fact that only a small percentage of SMEs reach the upper category, that of medium-sized companies. The third criterion (company autonomy) requires detailed investigation and privileged access to expensive private databases. In addition, the degree of remoteness of intermediate links between interconnected companies has been very difficult to assess (Centre for Strategy and Evaluation Services, 2012; European Commission, 2017). The relevance of all SME criteria is encountered mainly at individual level; for example, to assess the eligibility of a specificcompany in relation to certain preferential EU systems favouring SMEs (e.g., funding programmes, state aid exceptions, reduced administrative fees). In general studies, however, examination of every single criterion is not a categorical requirement since the three SME criteria have a primary focus, the employee headcount, and the rest can operate as additional filters. As the application of the main, first criterion of employee headcount, i.e. SME ≤ 249 employees, suffices to determine a general representative percentage (e.g. A%), then, partial or non-examination of remaining filters simply means that the final accurate number is always less than the general representative result that the first criterion established (it will always be Final% < A%). Thus, if the general representative percentage (A%) points to a small share of SMEs, the even smaller (Final%) does not change the evaluation and conclusions of the given study.

 Our study focuses on the actual number of patents the EPO granted in 2014, which is the publication year of the EU studies discussed above and is close to the completion period of the UPP’s legislative texts. The period covered in our study is the entire year of 2014. The year-length scope should be considered a satisfactory innovative period, considering the rapid pace of technological innovation and global competition, seen also in the very large number of patent applications submitted in any given year. The statistical results of patent shares in the global competition in European patents are similar to those of the following years. The main change that is consistently observed, year after year, is the continuous reduction of the patent share of EU-based companies. It should be pointed out that, following the exit of the UK from the EU in 2020, all patent statistics of EU-based companies will automatically remove UK data, leaving a much weaker picture.

 From the EPO’s official and publicly available edition of the *European Patent Bulletin*, containing all European patents that are granted by the EPO on a weekly basis, data were extracted to build the dataset which consists of all patents granted by the EPO between 1 January 2014 and 31 December 2014. This dataset consists of a total of 64,585 patent records.[[12]](#footnote-13) From the dataset, four hundred B1 documents (ie. a European patent first granted in 2014) were selected using a random number generator in a python script. The size set was determined by the need to achieve a precision level of 5 % (confidence level of 95%) on the proportion of SMEs in the target patent population.[[13]](#footnote-14)

 The SME/non-SME status of each of the 400 entities of the selected sample was individually searched. The main criterion applied was employee headcount (fewer than 250 employees), which is the main criterion of the European Commission. For this purpose, internet searches were made based on the enterprise’s name and address, starting with the company website and publicly accessible financial databases. Additional websites, such as Linkedin, were searched to check the information. Where there was insufficient information on the internet, the information was found through direct contact, such as emails and phone calls. In addition to the main criterion of the number of employees, the dependency of SMEs on larger companies (the third criterion of the EU’s SME definition) was also searched using similar sources. Entities found to be controlled by large companies were classified as large companies. For relevant information on foreign-language websites, Google translate was used. The additional definitional criteria regarding annual turnover and balance sheet were not investigated. Five enterprises for which no information was found on the internet or through direct contact were classified as SMEs on the logical assumption that small companies tend to invest less in their digital presence than large entities.[[14]](#footnote-15)

 

**Figure 1**. Applicants’ firm size, 2014

 Figure 1 shows that 81.7% of all European patents are granted to large companies, whereas 17.3% are granted to SMEs. 1% of the patents can be assigned to universities and public research centres. Subdividing the SMEs’ share in respect of geographical origins reveals that 10.3% of all European patents are granted to EU-based SMEs, and 7% to non-EU-based SMEs. An additional examination of the total SME share of 17.3% can be undertaken to estimate national shares therein. Suchsubdivision should be seen as indicative since the initial working sample is reduced by the lower number of SME patentees found. It is observed that the share of SMEs based in Germany is 14.5%, whereas the other developed states of France, UK, Italy and the Netherlands have a combined share of 26.1%. For the other 23 member states the corresponding share is 18.8%. As fornon-EU-based SMEs, their share is 40.06%.

 The main findings show that the share of EU-based SMEs in the European patents that the EPO grants is very small and covers only 10.3% of patent volume in the year concerned, compared with 81.7% for large companies and corporations.

**National origins of European patenting**

The national origin of the patent applicant/patentee is the main feature of the EPO’s public data system and annual reports. Its statistical information presents the combined national share of European patent activity of all companies based in a national state, be it European or non-European. The national shares and those of company size can provide, in combination, a more comprehensive picture of how the costs and benefits of the patent systems are distributed. In the interests of consistency, the patent year that is examined is 2014. The results are similar to those presented in Xenos (2013), as well as to those of subsequent years, as seen in the EPO’s annual reports and statistics.National shares are calculated from the actual total number of patents the EPO grants and the patent data for each individual state. Adding together all 28 member states, the shares of EU-based patentees can be categorised, as follows:



**Figure 2.** Applicant's country of residence for EPO patents granted in 2014 (% of 64,613 grants)

 Figure 2 shows that most European patents (54%) are granted to applicants that are not based in the EU. This corresponds to 34,892 patents that entered the European market as monopolies of technological solutions which did not originate from, or are not owned by, EU-based companies. This majority share of European patents shows that technological and commercial competition from non-EU economic actors is very strong. As the unitary patent regime increases substantially the scope of monopoly of the European patent, the dominance of non-EU based companies is expected to increase substantially. For the great majority of 23 EU member states, the combined share of European is just 9%. Some of these states have a negligible number of patents, such as Poland (108 patents) and Bulgaria (7 patents), while others do rather better, such as Finland (633 patents). In contrast, companies based in Germany had 13,086 patents, that is 20.3% of all European patents that the EPO granted in the relevant year, a share that is close to the combined share of the other 27 member states.

 When the focus is put on certain technological areas the difference in patent shares between EU-based and non-EU based companies is much greater. Such information was presented by Eurostat (2016) that looked at EPO patent applications in years 2012 and 2014. In particular, in certain key technological sectors, such as information and communication technologies (which accounted for almost one third of all patent applications), the share of EU-based companies is only 32.0%. A similar picture is observed in the biotechnology and nanotechnology sectors.

In sum, where economic positions are very unequal, the extra benefits (including discriminatory ones) that the unitary patent system gives are designed to help those in an already dominant position most.

**The European/international patent system’s impact on SMEs: primary and secondary considerations**

SMEs were the main focus of EU organs when the UPP was set up. It is also an economic fact that a great number of member states are dependent on SME patenting activity. In the current study, emphasis is put on the cost of the patent system as this essential information is absent from the official EU legislative studies. Despite their focus on SMEs, EU organs did not examine the UPP’s impact on SMEs. In addition, the studythat the European Commission’s external academic contractor, Harhoff (2009) produced on the UPC is not European as it covers only a handful of the most developed national states that are the main beneficiaries. What is more, this official ‘economic’ study is not economic at all as it mainly provides basic metrics for the privileged, few developed states (Xenos, 2013). As it does not cover serious inherent costs, such as the endemic anti-competition effect of monopolies created by patents and the associated market failures, it is not an economic study. The fact that the European Commission did not prepare an economic study on the UPC is also evident by the objective observation that its UPP studies never passed procedural institutional scrutiny by any economic committee of the EU Parliament. It is significant that the official study of Harhoff (2009) has long been removed from the EU’s main portal and from the list of public information that the European Commission provides on its relevant UPP website.

**Benefits of secondary consideration as the European** **Commission’s trump cards**

The contribution of patents to technological innovation is a textbook justification for patents as objects of property. Though there are also major costs inherent in the anticompetitive effect of patents, the EU adheres to a benefits-only approach. The apparent benefits of the UPP can be identified by the very nature of the institutional framework that is introduced, the communicative narratives of EU organs and the wording of the official texts that have been adopted. Under the new system, the existing European patent will acquire a unitary effect, thereby extending its territorial coverage to 25 participant states. This confers a clear benefit to the patentee as the more states in which a patent can be enforced, the greater the monopolistic effect of that patent. However, the same applies to the great dangers associated with the inherent anticompetitive effect of patents. The administrative system is centralised to ensure the unitary application of EPO patents, and promising that the administrative fees for coverage in all twenty-five member states would be less than the sum of the individual fees for each country. This administrative fee discount appears, at a first glance, to be an economic benefit of the unitary patent. However, these measures do not much benefit SMEs because these entities do not have many patents.

 Under the current system, the territorial coverage of a EPO patent concerns usually 3-6 states that the patent owner selects (Pagenberg, 2012, p. 583). As these are often the biggest European markets, their combined territory is admittedly very large. Therefore, making richer under the UPP those who are already rich under the current bundled system does not make any ground-breaking difference. Professional associations of patent law firms confirm that only a very small percentage of SMEs ever seek protection at a pan-EU level (Chartered Institute of Patent Attorneys in the UK, 2012, p.122), simply because they do not do business in the markets of all EU states. Consequently, a reduction in patent fees is for wide territorial coverage that is not much used. In addition, as the EPO (which will administer the unitary patent) is not an EU body, the EU cannot exercise direct control to guarantee its political promise of reduced patent fees. Recent studies suggest that patent fees are likely to increase (Stjerna, 2016).

 Moreover, as a reduction in patents fees is enjoyed by everyone, this will benefit mostly large companies, which patent most. If the official focus on SMEs were not fake, a preferential system would have been introduced in which SMEs would pay reduced administrative fees, as is the practice in various business sectors. Equal rules for all can lead to more inequalities when the main players are a small number of large corporations from a small number of states, the majority of which from outside the EU. Most importantly, patent fee reduction alone is a factor at the very bottom of applicants’ priorities. There are far more important factors that precondition patenting ability.

**Could SMEs benefit from the patent system and the UPP?**

The EU’s focus on a possible (but not certain) reduction of patent fees concerns an issue that is largely unreachable for the greater majority of SMEs. The focus on reduced fees or the much wider territorial monopoly/reach of the unitary patent is like reducing train fares and expanding the rail network without providing access facilities for the disabled – meaning that both transport and its network is beyond their reach (see Stanisław Sołtysiński’s similar metaphor, Krakowiak, 2014, slide 12).

 Moving beyond the benefits-only, restrictive framework of secondary considerations within which the EU organs frame their studies, and by extension, the political and economic debate, the primary issue remains whether SMEs have benefited (actually) or can benefit (potentially) from the patent system, especially under the new international arrangement with the UPP. To see if and how in the future, the UPP can help SMEs when it becomes operational, the examination should start from the current European patent system, as the UPP is an expansion of it. In particular, in order to have a comprehensive appreciation of what is going on and move beyond narrowly-framed EU studies and policies, certain aspects of patenting ability need to be identified, as the UPC exacerbates them all.

a) *R&D*

In a number of industries, such as pharmaceuticals and nanotechnology, innovation is inextricably linked to large spending on R&D (research and development). The role of funding is indispensable for competitive innovation and patenting activity and affects the whole spectrum of technological research, starting with young persons’ education and research (Bell *et al.*, 2017). The main issue is, of course, funding sources. The key observation is that SMEs do not have large funds to undertake R&D, especially at the usually advanced level of global competition. Limited finance is also the second criterion of their eligibility status under the EU’s SME definition. Consequently, SMEs are inherently disadvantaged vis-à-vis large firms.

b) *Existing and future market share*

A good market share secures the requisite financial position of a company, allowing it to devote funds to R&D. Market share is facilitated considerably by patents and patent portfolios. Exclusivity and the monopolistic effect of commercially successful patents can increase considerably a company’s market share. As SMEs do not have many patents, the increasing ability of their large competitors to acquire new patents (through their own innovation and/or by buying others) reinforces and augments their market share, which in turn further boosts their ability to compete successfully in patenting activity and acquisition. This is the win-win circle of patent acquisition:

*...market share →funds for R&D → patent acquisition → market share → funds for R&D → patent acquisition → market share …*

In the formula above, the starting point is not patent acquisition, but the established market share through which funds are directly secured for the research and development required to achieve patent acquisition. As a result, the starting point favours established players in the European patent system and industrial markets.

c) *Existing know-how*

Competition in technological innovation does not start from a zero basis in that existing patenting activity and presence in markets reinforces future patenting ability. In this respect, market share and patenting activity are seen as objective indicators demonstrating scientific and technological know-how and technological ability, Conversely, they confirm that those with low or non-existing patenting activity, as is the case with SMEs, cannot easily compete in sectors and markets where innovation is expensive and competitive alongside established large firms.

*d)* *State’s educational and funding system*

As industrial innovation requires a high level of scientific knowledge and, in certain sectors, expensive laboratories and research equipment, the patenting ability of a company is closely linked to the state’s investment in scientific research and education (Lazonick and Mazzucato, 2012; Mazzucato, 2013; Buchanan, 2013; Cable, 2014; World Economic Forum, 2014). In addition, as state funds for the education system and research circumvent the state aid restrictions that the EU imposes, the necessary state funding is channelled through university research and teaching that benefit mainly the nationally-based companies, whose subsequent successes sustain the state’s budget.

e) *Room for innovation and market entry and sustainability prospects in reverse proportion to the number of granted patents*

The ability to innovate is limited by the available number of technical solutions. In this respect, the more patents that enter the system, the more difficult it becomes to innovate. This issue is pertinent as the UPP gives the EPO patent a very wide territorial coverage which is much larger than that of the US and causes a dramatic increase in patent imports. For current purposes, it suffices to illustrate the negative impact on innovation by the presence of large numbers of patents with reference to the phenomenon of patent thickets: “[p]atent thickets decrease entry (i.e. first time patenting in an area) by 20%, which is substantial bearing in mind that the average probability of entry into a technology area is only about 1.5%” (Hall, Helmers, and Graevenitz, 2016). As the UPP exacerbates this situation by the sudden and automatic expansion of the scope of monopoly of technological solutions, the new, high influx of mostly foreign patents, mostly from non-EU based states, will restrict considerably the already limited room for innovation, especially for SMEs (Deloitte, 2012, p. 32).

f) *Patent fees*

Unless there is some ability to compete with a technological invention for which there can realistically be a patent application, the fees for a patent application are hardly relevant. And yet, this was the main economic focus of the EU for the UPP (European Commission, 2011).

**Revealing the real focus of the UPP**

The lack of pre/post legislative studies on the position of SMEs *vis-a-vis* the UPP suggests that SMEs are not the real targets of the UPP. Rather, they are merely convenient slogans that appeal to state representatives at EU level. In the current, ex post EU legislative period, pertinent facts are gradually appearing, albeit in piecemeal fashion. They reveal that in the current conditions of global technological competition, the average size of a patenting company is that having more than 1573 employees (EUIPO, 2015, pp. 8 and 36). This concerns a company that is four times larger than the maximum size of a SME. In such a competitive environment, the issue is not about the innovative ability of SMEs, but how fast they can outperform their global, larger and stronger competitors. Therefore, the patenting ability of SMEs is a matter that is assessed mainly in relation to the ability of other competitors (and the supportive state systems of the foreign states in which they are based). In contrast, for all other intellectual property rights, such as trademarks, copyright, and designs, innovative ability can be assessed in its own right without comparative innovation standard.

 As the average patenting company is clearly not a SME, theEuropean Commission is now openly seeking to revise the thresholds of the EU’s SME definition so as to accommodate start-ups/scale-ups, opening the way to intermediate-sized companies and possibly to companies with links to large companies (European Commission’s Inception, 2017; Xenos, 2018). If larger companies are included in the SME definition, this will distort all previous studies, and will show improved SMEs statistics. However, what matters ultimately is not the position of SMEs, as such, but their economic relevance to the national states’ industrial and economic activity and how the patent system and the UPP will affect them when it becomes operational.

**The wider impact of the UPP on national states**

To examine the UPP’s impact on national states, it is necessary to rely on the statistical information for SMEs because a great number of national states depend on their industrial and patenting activity. In addition, the states’ position can be appreciated by looking at their patent export-import ratios.The impact of the patent system is felt mainly at national level, where business activities are a living experience, and where a state’s social-economic and security systems provide relevant avenues and infrastructure for economic development and sustainability. EU policies and measures in the context of industrial property affect the state’s entire mechanism, including important areas, such as national security and defence. As patents exclude or limit the use of technological solutions in products and processes, vital technologies (e.g,. in cybersecurity) increasingly fall into the hands of a few foreign states. Not only does the EU have nothing to do with defence issues, but there is also no pan-European co-operation between member states in defence technology. In this context, the main relationship that exists between EU member states is that of client-seller.The example is typical of the ongoing transfer of wealth from less developed to more developed states (of EU/non-EU) that relates to technologies controlled by a small number of players through the patent system. Such transfer of wealth could only be offset if a common federal (e.g. defence) system existed.

 The risk exposure of national states under the unitary patent system can be appreciated by looking first at the degree of a state’s dependency on nationally-based SMEs. This relates to the proportional patenting of SMEs in total European patenting of national businesses. Some SME shares from the Eurostat 2014 study have already been mentioned: Germany (10.3%), Finland (13.2%), UK (35.3%), Italy (37.1%), Poland (34.0%), Bulgaria (53.8%). The degree of risk exposure is lower in Germany and Finland and very high in Bulgaria and relatively high in Italy, Poland and the UK. Accordingly**,** the risk exposure of the national state to the negative effects of the patent system, and in particular of the new unitary patent regime, is related to the state’s dependency on SMEs.

 Based on the statistics about the national origins of European patenting, as presented above, it can be asserted thatwith the exception of some states, such as Italy and the UK, the European patenting activity of states increases in inverse proportion to the SME share in that activity. The higher the national SME share in the overall number of European patents of all nationally-based companies, the lower the patenting activity of that state at European (EPO) level. Where the state depends on the patenting activity of SMEs, that state’s innovation capacities, technological development and economic competitiveness in technology sectors tends to be weak compared with states where large companies and corporations have a more dominant share.

 Even when states are not particularly dependent on the patenting capacity of SMEs, this does not mean that the European patent system or the UPP is risk-free. Thus, although Finland performs better than many other SME-dependent states, because its degree of dependency on SMEs is relatively small, the concentration of economic and technological power in a small number of corporations and large companies has wider socio-political and economic dimensions. In such circumstances, any economic failure that may be caused by the continuous successes of other global competitors creates an equally high degree of risk exposure. By way of example, NOKIA, the Finish telecommunications company, until recently one of the market leaders in mobile phone technology at global level, is now confined to a very small market and its presence is little noticed (Surowiecki, 2013; Taulli, 2013; Juan, Khanna, and Snively, 2017). Finland does not have the number and size of multinational corporations of Germany, neither do they cover a wide range of technological sectors allowing loss of competitiveness in one sector to be mitigated by technological activities of large companies in other sectors.

 An additional parameter that increases the national state’s risk exposure relates to the actual numbers of patents owned by SMEs and state-based economic actors. Although both the UK and Poland have a similar, relatively high, degree of dependency on SME patenting, the actual number of patents of UK SMEs and all UK economic actors is much higher than Poland’s. The observed differences in the numbers of actual patents granted annually is a pertinent factor in determining the states’ risk exposure and reveals who benefits most at the expense of others. In general, this factor can be estimated by identifying a state’s patent export-import ratio of patents, and estimating how this will change under the UPP.

 It is possible to use the example of Poland, since it is the only state that prepared a comprehensive economic study (within the usual technocratic scope of accounting standards) at the time when the UPP was passing the final legislative stages at EU level (Deloitte Polska, 2012; Xenos, 2013, p.268). It is also a European state with very low patenting activity, typical of many other European states. The relevance and value of the Polish study can be attested by its publication on the website of the Slovenian Intellectual Property Office, from which it is currently available. The Polish study finds that, in 2011, under the current patent system, Poland had 38,000 patentsin its national market (Deloitte Polska, 2012, p.3; Krakowiak, 2014, slide 11), most of which should be imports since the country’s patenting activity was, and still is, very low. Under the unification of national patent markets by the UPP, patent flow will increase dramatically at national level. For Poland, it is estimated to reach almost 900,000 patents within twenty years (Deloitte Polska, 2012, p.5).

 Because of the automatic, much wider territorial coverage that the UPP creates, the already unbalanced, patent import-export ratio that is observed between member states and between them and non-EU states can only be exacerbated. For this examination, it is necessary to look at the annual number of European patents the EPO grants to nationally-based companies and compare it with the total number of all EPO patents that can potentially become enforceable in the much wider territorial market created. In this way, the difference between exported and imported patents under the UPP can be estimated, as follows:

*(annual number of European patents of state-based companies) - (total annual number of European patents) = -Y*

and *(-Y) x (five consecutive years)*

 In the statistical analysis of patent data in previous sections, the share of economic actors and states could generally be identified by considering one year only. However, the actual volume of industrial monopolies is not limited to one year only but has a cumulative, piling up effect (year-after-year-after-year…). In 2011 and 2015, the EPO granted 62,112 and 68,400 patents respectively. Thus, in any given year, a high number of industrial monopolies enter national markets in Europe. If the average annual patent number is taken for the five-year period 2011-15 (approximately 65,000 patents), the total number of European patents in the last five years isaround 325,000. As the numbers of granted patents increase,[[15]](#footnote-16) many European patents are to be expected when the unitary patent becomes operational. Although the current EPO system of bundled patents will still be available, it is expected that a great many of the hundreds of thousands of existing patents will be upgraded to take advantage of much wider territorial coverage than the current system offers. Consequently, as the unitary patent automatically extends the EPO patent to 25 member states, a much higher volume of imported patents will enter the national markets of 25 member states within the first five-year period, and will increase continuously.

 The advent of the UPP will flood national markets with an unprecedented import of European patents, most of which are owned by non-EU-based companies, thereby aggravating considerably the already poor opportunities for technological innovation, SME sustainability and entry prospects of young companies in patent-dependent technological markets. The sudden and massive increase of industrial property monopolies will affect all innovative and industrial economic actors in the EU because the majority of European patents are granted to large companies from a few states, mostly outside the EU. In short, the unification of national patent markets through the UPP disturbs a very crucial factor in innovation and industrial activity, which is the available room for such activity.[[16]](#footnote-17)

**Constitutional implications and their economic effects**

There are some serious constitutional problems with the UPP that have economic implications also. At first glance, it may seem that EU organs tried to create a federal patent system that would be institutionally similar to the existing EU federal trademark system. Instead, they ended up with an asymmetrical, unconstitutional arrangement under which the main, pseudo-‘federal’ institutions are international, non-EU organs (i.e., the EPO and UPC). Involving international bodies as the main institutions of the new European patent system virtually eclipses the legislative power, national and EU, which would directly and effectively influence and control them.In addition, the EPO and the Unified Patent Court (UPC ) are not institutionally connected to each other and, therefore, the new international court, the UPC, cannot exercise the fundamental constitutional function of judicial review to control the interpretation, application and development of patent law by the administrative body involved, the EPO – nor would it matter if it could as the UPC is not directly controlled by the elected representatives of the people. The democratic deficit that is characterised by the absence of direct judicial and legislative control of the EPO at regional and European level has not been addressed by the new unitary patent system of the EU.[[17]](#footnote-18)

 More seriously, the minimal and *ad hoc* control that currently exists at national level in the form of case-by-case national judicial examination of EPO decisions and principles is to be abolished. Even then, only 1% of EPO patents ever came before a court (European Commission, 2011, p. 32 and footnote 101).

 The fundamental constitutional role that national courts currently play is illustrated in thedomestic legal case of Aerotel which involved a software patent the EPO had granted, the national judges modified the EPO test for the patentability of software, by simply adding one, additional question to the existing EPO test (Court of Appeal of England and Wales, 2006). Such issues are of crucial importance because they determine or adjust the rules from which the patent emerges and remains valid as a proprietary right. In a legal case under the current system (in the pre-UPP period), two stages are relevant: first, the EPO stage from which the patent emerges as an object of property in legally-binding terms and, subsequently, the national courts, which deal with its enforcement. In the Aerotel case, these two stages produced two different legal tests to determine the emergence of patents, with the national court’s being more difficult to establish since an additional question had to be examined and satisfied. This begs the reasonable question of whose test is more appropriate, that of the EPO or that of the national Court of Appeal?

 A large number of patents or their concentration in the hands of few companies may hinder innovation and the sustainability of many companies. To address this problem, a judge can set a more difficult test making patentability more difficult, thereby reducing the patent flow in the market. In this way, judicial control can mitigate against an unwarranted anticompetitive effect of patent monopolies. In the Aerotel case, the national court has justified the application of a stricter test with reference to an economic policy that would suit the needs of UK industries. However, at the European/international, nobody really knows which policy and for the benefit of which state the EPO’s tests serve. Certainly, the EPO’s own interest are served - more patents mean more income from administrative fees (Drahos, 2010).

 As the UPC is going to abolish the already limited, case-by-case-only, jurisdiction of national courts, there will be nobody to protect national economic actors, such as SMEs, from undesirable policies and actions of the EPO. Indeed**,** national control will be needed more than ever as a result of the dramatic increase in the nationalisation of international patents under the UPP. Although the UPC Agreement says that a better ‘enforcement’ framework will be secured by foreign, international judges, the total abolition of national judicial jurisdiction means there will be no judge who is genuinely concerned with the sustainability needs of SMEs and other economic actors. The judgment and especially the reasoning in the Aerotel case show, in the clearest possible way, that the national judge not only protects SMEs’ industrial activities and innovation by restricting/adjusting the flow rate of patent monopolies, but also discourages legal action being taken against SMEs.**[[18]](#footnote-19)**

 There are additional problems relating to certain discriminatory arrangements that contravene basic human rights.The single route that the UPC aims to provide is divided by local, regional and central divisions. Although the local base of the international court may determine the national language in which the defendant company is based, such a local base may not exist and relevant expertise may gradually grow in the central divisions, whose very purpose is speciality in certain technological sectors. Regional divisions may not allow the language of the defendant, and central divisions restrict their operational language to the one language in which the claimant’s patent has been granted, which will be one of the three official languages of the EPO. Such direct discrimination infringes constitutional human rights, namely the right to fair trial that applies either alone and/or in conjunction with the protection of property (of the defendant).[[19]](#footnote-20) Unlike, economic law, constitutional law sees human rights as inalienable rights that reinforce the entire constitutional structure and values of the political system. They cannot be abolished without threatening the entire constitutional system, which sees no exception to clear-cut human rights violations as they fly in the face of the whole system. Therefore, this is a matter that will affect the entire status of constitutional law and of the democratic, constitutional structures of the state.

 Language discrimination also has economic implications in that it imposes financial burdens on the defendants in patent litigation (including those forced to settle litigation threats). As SMEs do not have many patents, the language discrimination regime will burden them considerably. Given the adversarial nature of the patent system, any disadvantage or discrimination confers a benefit to one party only. It is perhaps in this context that the European Commission has recently admitted – under its standard *ex post facto* practice – that the cost of patent litigation under the UPC “hits SMEs disproportionately hard” (European Commission, 2015, p.71).

**Conclusion**

By regulating almost all aspects of technology, the patent system affects industrial competition, activity and use of technology. There is hardly any economic activity that is not dependent on patented technology. Some sectors, such as health care, environment, energy, security, defence and software are particularly vital. Therefore, the democratic control of industrial property in national markets is an essential responsibility of the state. Yet, the state is being stripped of democratic control by the EU’s new, pseudo-federal patent system.

 The technocratic approach that characterises the institutional political debates at EU level is convenient because a more thorough political-economic and social examination would have revealed the paradox of federalisation of the patent systemin the absence of a federation. As the EU is neither a state nor a federation, the inherently adversarial nature of the international/European patent system has already contributed to an ever-increasing transfer of wealth from less developed to more developed states. Had EU actually been a federal state, such a transfer of wealth might have been offset by the redistribution of wealth to support all other federal systems, such as education, social welfare and defence. Such a genuine federal system exists in the US, which - unlike the EU - maintains a reasonably balanced, patent import-export ratio. As a result, in US there is accumulation of wealth which is subsequently redistributed to the common systems of the state. In Europe, the absence of federation means that there is no redistribution of wealth. In addition, there is not much wealth to redistribute in that the majority of European patents are taken out by non-EU based companies. Given the disadvantages under which the international patent system in Europe operates, the EU has pushed its pseudo-federalisation by augmenting all the key elements of the adversarial nature of the patent system. First, it gives a unitary/federal effect to the European patent that increases the number of imports of patent monopolies from dozens of thousands to hundreds of thousands; and second, it abolishes national control, resulting in a total loss of national sovereignty in circumstances where national control is needed more than ever because of the unprecedented increase in the volume of patent imports. The loss of national control is exacerbated by discriminatory, and hence, unconstitutional, procedural conditions allowing foreign patent litigation in a foreign language. Such absolute surrender of national sovereignty in peacetime is institutionally and historically unprecedented. In this respect, the UPP facilitates the emergence of zombie states where democratic control and national elections play little role in state business and the well-being of the people.

 The patent data confirm what is already apparent: European markets have long been dominated and are increasingly being dominated by large companies that are based in few states, mostly from outside the EU and increasingly from Eastern Asia (China, South Korea and Japan). In the minority share of the total number of European patents, one state, Germany, has almost as many patents as all other member states of the EU combined, a situation that will become more dominant when the UK leaves the EU in 2019. The combined share in patenting of 23 member states is just 9%, while there is a good number of states where such activity is negligible. The EPO’s has been allowed to set itself beyond judicial and legislative oversight. Objective evidence has emerged, albeit *ex post*, showing that the position of SMEs is very weak under the EPO system as their share of annual European patents granted is less than 10% and 17% in patent applications. These statistical results contradict the official justifications of the UPP, which focus on benefits for SMEs.

 The current study presents a manageable methodology for the collection and evaluation of patent data. Additionally, key economic factors that determine patenting capacity have been identified and evaluated. Such a holistic approach, with emphasis on preliminary conditions, enables us to escape the framing of the debate within the secondary considerations which EU organs have employed. Democratic control and effective oversight of such major economic-political issues requires external independent research and evaluation. Loss of national sovereignty removes not only national control, but also the contribution of independent expert opinion.

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1. The research work for the article's section 'SME share in European patents' was carried out by Ms Hanh Mai Nguyen under my supervision. I would like to thank her for her contribution. [↑](#footnote-ref-2)
2. Consider the Greek socialist party (PASOK) in 2012-3, and subsequently, that of France (PS - Parti Socialiste) in 2017. Both parties were once pioneers in the re-emergence of socialist parties as ruling governments in Western European political scene in the difficult years of the Cold War, a preponderant status which they have long maintained in centre-left European politics, until their recent and rapid demise. [↑](#footnote-ref-3)
3. Consider the current coalition government in Austria and Italy and the rise of the far right in the Netherlands, France, Italy and Greece. [↑](#footnote-ref-4)
4. The current parliamentary opposition in the Netherlands, and the finalist candidate in French presidential elections (see Louwerse and Otjes, 2018). [↑](#footnote-ref-5)
5. Regulation (EU) No 1257/2012, pp.1–8, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32012R1257. Regulation (EU) No 1260/2012, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32012R1260. [↑](#footnote-ref-6)
6. Regulation (EU) No 1257/2012, Recitals 19 and 22, Article 12; European Commission (2011); opening page, second paragraph of the Agreement on a Unified Patent Court (2013) OJ C 175/1, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1544563830568&uri=CELEX:42013A0620(01). [↑](#footnote-ref-7)
7. “… the EU Patent should dramatically reduce the cost of patenting in Europe, *particularly for SMEs*” European Commission (2010, p.18) (emphasis added). Convenient statements about SMEs have been appearing in all relevant public communications of the European Commission (see UPC-related tweets of the current, European Commissioner of the Department of Internal Market, Industry, Entrepreneurship and SMEs, Elżbieta Bieńkowska – a Polish national whose national state rejected the UPC on the ground that it would hurt SMEs, on which Poland’s economy depends (Deloitte, 2012). [↑](#footnote-ref-8)
8. Known until recently as the Office for Harmonization in the Internal Market, its responsibilities do not cover patents but only trademarks and designs. [↑](#footnote-ref-9)
9. The monopoly effect of patents is general, but is more directly felt when the patent is valid at national level too. In the current pre-UPP period, European patents are validated less often in small or poor national markets - the great majority of member states (Deloitte, 2012). [↑](#footnote-ref-10)
10. In 2018, 924 EPO patent examiners wrote to the EPO's Administrative Council raising serious concerns about the continuous decline in the quality of patent examination at EPO (available at https://regmedia.co.uk/2018/03/15/epo-examiners-letters.pdf. Reference was made to a position letter (Bausch, 2018). See also Schestowitz, 2018. [↑](#footnote-ref-11)
11. Similar problems have also been encountered in recent decisions of the EU General Court, *Crosfield Italia Srl v European Chemicals Agency* (available at http://curia.europa.eu/juris/liste.jsf?language=en&num=T-587/14) and EU General Court, *K Chimica Srl v European Chemicals Agency* (available at http://curia.europa.eu/juris/liste.jsf?language=en&num=T-675/13). [↑](#footnote-ref-12)
12. The number of patents displayed on the EPO’s website is 64613 for year 2014. Compared to the number of our dataset, there is a very negligible difference of 28 patents that does not affect the statistical examination. [↑](#footnote-ref-13)
13. Both the dataset and the sample, which derived from it, have been verified by subjecting them to an additional analysis regarding the geographical origins of patent shares (i.e., applicant company’s address in the *Patent Bulletin*). The national shares found in the sample match the actual national shares of European patents. [↑](#footnote-ref-14)
14. The same assumption is made by the Eurostat study (Eurostat, 2014, p.30). [↑](#footnote-ref-15)
15. In the last two years, the number of granted patents has suddenly and substantially increased reaching 100,000, but the patent applications rate remains at the same level. This is mainly attributable to management pressure and the EPO’s recruitment of more patent examiners. It is difficult to say whether this will be the new average or will have a short-term duration until the existing backlog within EPO is reduced. [↑](#footnote-ref-16)
16. “[the unitary patent system] limits creation of [technical] solutions which do not infringe those patents, which may decrease willingness to invest in innovations”. This should be considered in circumstances where innovation opportunities in patent-dependent industries is already very small. (Deloitte Polska, 2012, p. 32). [↑](#footnote-ref-17)
17. “In fact, the decisions of the EPO concerning patents can only currently be reviewed by the internal chambers of appeal created within the EPO, excluding any judicial appeal before an external court. There is no possibility of the European Court of Justice ensuring the correct and uniform application of Union law to proceedings taking place before the chambers of appeal of the EPO” (Kokott, 2010, para.71). This important opinion was never published and archived on the Court of Justice of the EU (Curia)’s web portal. It was only leaked on some websites, which have now cut most of its pages (see also Metzler, 2010). This is yet another example of lack of transparency at EU level, including that of the Court of Justice, which never found it necessary to address the remarks of its Advocate General, Juliane Kokott (see also Borrás, 2006; Drahos, 2010). [↑](#footnote-ref-18)
18. See, similarly, the US Supreme Court case of Alice Corp. Pty. Ltd. v. CLS Bank Int'l et Al., 573 U.S. 208. A higher dismissal rate of legal actions has been observed in the post-Alice period (Morton and Shapiro, 2015). [↑](#footnote-ref-19)
19. Article 6 of the European Convention on Human Rights, and Article 47 of the Charter of Fundamental Rights of the European Union, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:12012P/TXT (Xenos, 2014a). [↑](#footnote-ref-20)