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EP PATENT FILING TRENDS FOR LEADING UK & GERMAN IP FIRMS: INDUSTRIES & LOCATIONS OF THEIR MAJOR INTERNATIONAL CLIENTS

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1 EXECUTIVE SUMMARY

IP Pragmatics is a technology and IP commercialisation consultancy, with broad expertise across many industry sectors. This white paper focuses on the European Patent (EP) filing trends of the top ten patent law firms in the UK and Germany for the time period 2014-2018, and aims to understand how these firms compare, particularly in respect of the type and location of their major clients in key international jurisdictions.

Most of the top ten UK patent firms tend to be of a similar size as measured by the number of annual EP filings, whereas there is a large degree of variance in activity of German patent firms even amongst the top 10, with the largest firms being significantly larger than any UK firm, but most of the top 10 being smaller than the 10th largest UK firm. Both UK and German patent firms have seen increases in the number of EP patents they file over the five-year period covered by this report, although growth has been more uniform for UK firms than for German firms.

For the top UK firms, the greatest volume of new patents has come from US clients, but the biggest growth has come from previously untapped markets in South Korea and China, suggesting a recent uptake of new clients from those regions.

The top German firms have seen the greatest increases in patent volume from Japan, with consistent growth across almost all 10 firms. Growth from the US sector has been more sporadic, with some firms actually losing US business over the period. German firms have also seen large growth from South Korea and China. While some firms already had connections to the Korean market in 2014, their links with China were negligible.

While US businesses may tend to use UK firms for their EP patents due to a combination of cultural and historical reasons, the dominating factor when choosing a patent law firm appears to be location. Firms with offices in Munich, close to the headquarters of the EPO, dominate the German top 10 firms, and 9 of the 10 top UK firms also have satellite offices in Munich. This effect is most pronounced when looking at clients from East Asia (China, South Korea, Japan), who overwhelmingly have chosen to work with German patent law firms.

While the UK firms are still behind in terms of numbers of EP applications with priorities from Asia, growth of business from these countries is faster for the top 10 UK firms than for their German counterparts, suggesting they are slowly catching up.

Analysis of the top IPC codes suggests that UK firms are more trusted with technologies related to medicine and therapeutics, whereas the German firms receive more work from the fields of digital communication.

The top 10 most active EP patent filing companies tend to work predominantly with German firms, although American companies appear to have a slight tendency to prefer UK firms. However, even when using UK firms, directing the business to the German offices of these firms is not uncommon, again suggesting that office location plays the decisive role in choosing a patent law firm to work with.

2 INTRODUCTION

In recent years, knowledge of patents and intellectual property as a whole has become more widespread and accessible, and patent offices all over the world have seen huge increases in application numbers. While the US has long been seen as the most important territory to have patent protection in, the regional European patent has gained a reputation for unrivalled quality. Such a reputation, combined with the enormous potential territory of protection and affordability, have made Europe a large and important market for patent protection for companies across the globe. Indeed, its relevance has only increased in recent years, with the chart in ***Figure 1*** showing that filing numbers have increased by over 25% in the five-year period from 2014 to 2018.

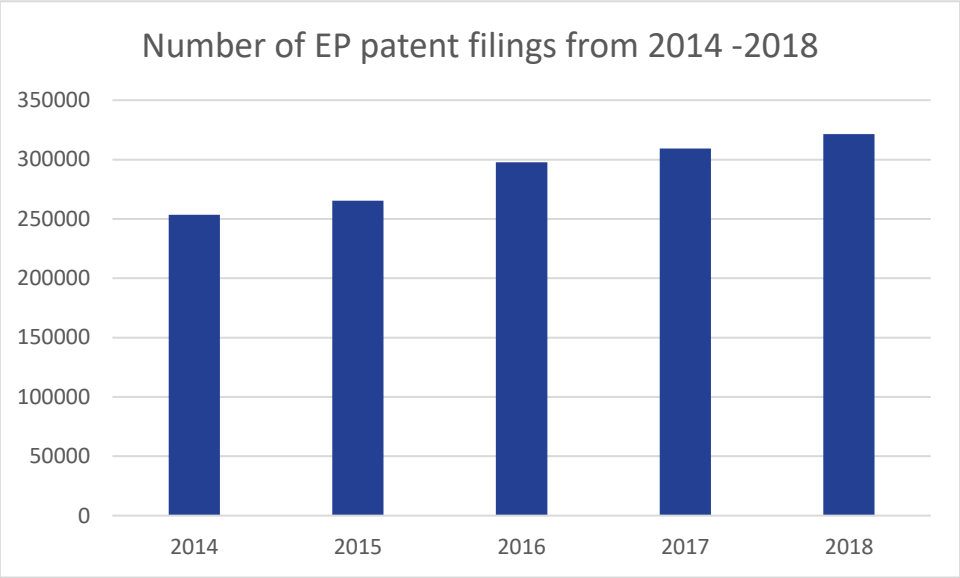

Figure 1 *– Chart displaying number of EP patent applications filed per year from 2014 to 2018*

These EP filings generally are part of a larger patent family, which could have origins anywhere in the world. The chart in ***Figure 2*** shows some of the priority countries for these EP patents, and how their numbers have changed over the 2014-2018 period.

As can be seen in ***Figure 2***, the greatest proportion of EP patent applications have US priority documents. Assuming that the vast majority of inventions are first patented domestically, this would indicate that a large number of EP patents are being filed on behalf of US clientele. Japanese clients occupy a distant second place position, while other Asian countries, such as South Korea and China, have been filing much less in Europe than Japan. However, as we can see over the period from 2014-2018, the most significant growth in patent filing numbers has been from China, with a 90% increase in applications over five years.

Increased globalisation, coupled with key innovation-promoting policies such as China's Made in China 2025, has made companies and inventors from the Far East more aware of the benefits of marketing and (perhaps more importantly) protecting their intellectual property on a much larger scale than purely domestic. While the first (and still most popular) foreign market for protection for these companies tends to be the US, Europe is increasingly being seen as an important market for protection by Korean and Chinese firms especially.

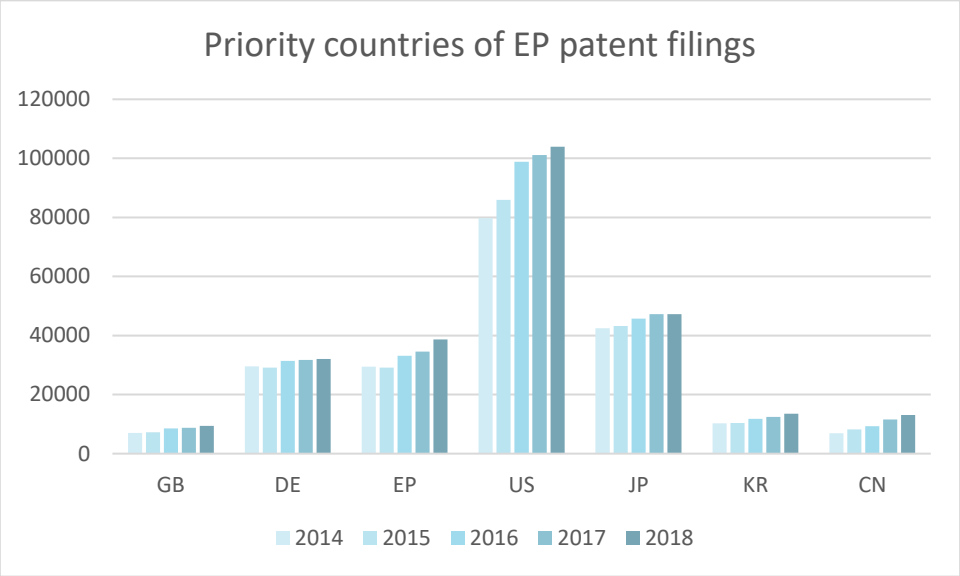

Figure 2 – Chart displaying priority countries for EP patent applications from 2014 to 2018

The combination of these factors has led to the significant increases in the number of EP filings in the last five years, and therefore increased business for many European patent law firms. As can be seen from the chart in ***Figure 3***, most of the business in patent filing is situated within Germany and the UK, with Germany having 50% more business than the UK, and over 400% more than the next closest country, France. It is safe to say therefore that the vast majority of companies globally wanting to file an EP patent will look for representatives in either Germany or the UK.

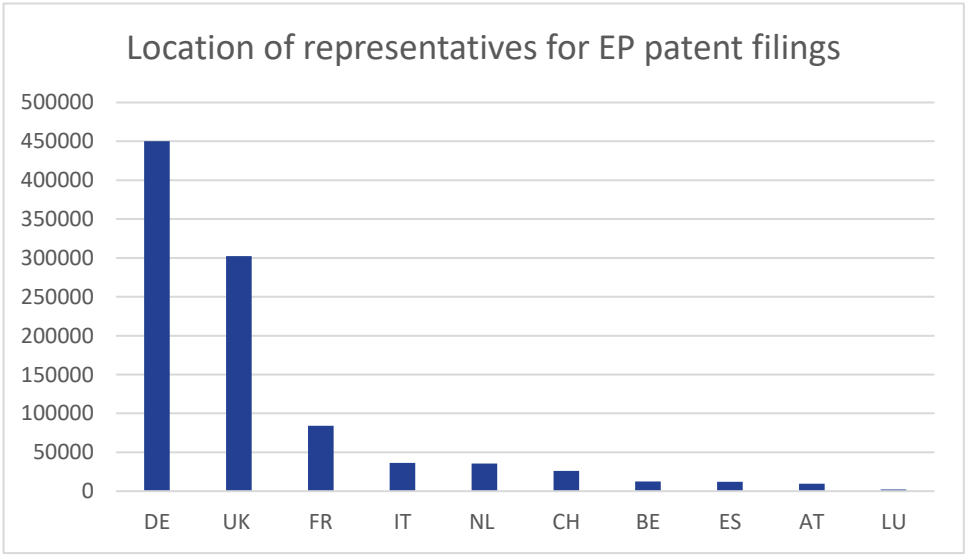

Figure 3 – Chart displaying the locations of representatives of EP patent applications

This white paper focuses on the top ten patent law firms within each of these two leading countries (Germany and UK), and looks to analyse how the increases in EP filing numbers are reflected within the increased business of those firms. More specifically, the paper also looks at how and if the origins of the business differ between the top German and UK firms, and aims to suggest possible reasons for any differences found. This analysis is then extended to encompass all EP patent filings in both countries in order to determine if these

reasons can be applied more generally. The identified trends and reasoning are then tested by analysing the patent law firms used by some of the most prolific filers of EP patents.

For reasons of privacy, patent law firms are henceforth referred to by number (i.e. Firms 1-10) for UK based firms, and by letter (i.e. Firms A-J) for German based firms.

3 EP PATENT FILINGS FOR UK IP FIRMS

As part of the analysis for EP patent filings, this white paper looks at the EP filing habits of 10 of the top filing UK patent law firms. This report defines a UK patent law firm as one with its main headquarters within the UK, although it may have satellite offices in other countries. The graph in ***Figure 4*** indicates the numbers of EP patents published in each year for each of these 10 firms during the period of 2014-2018.

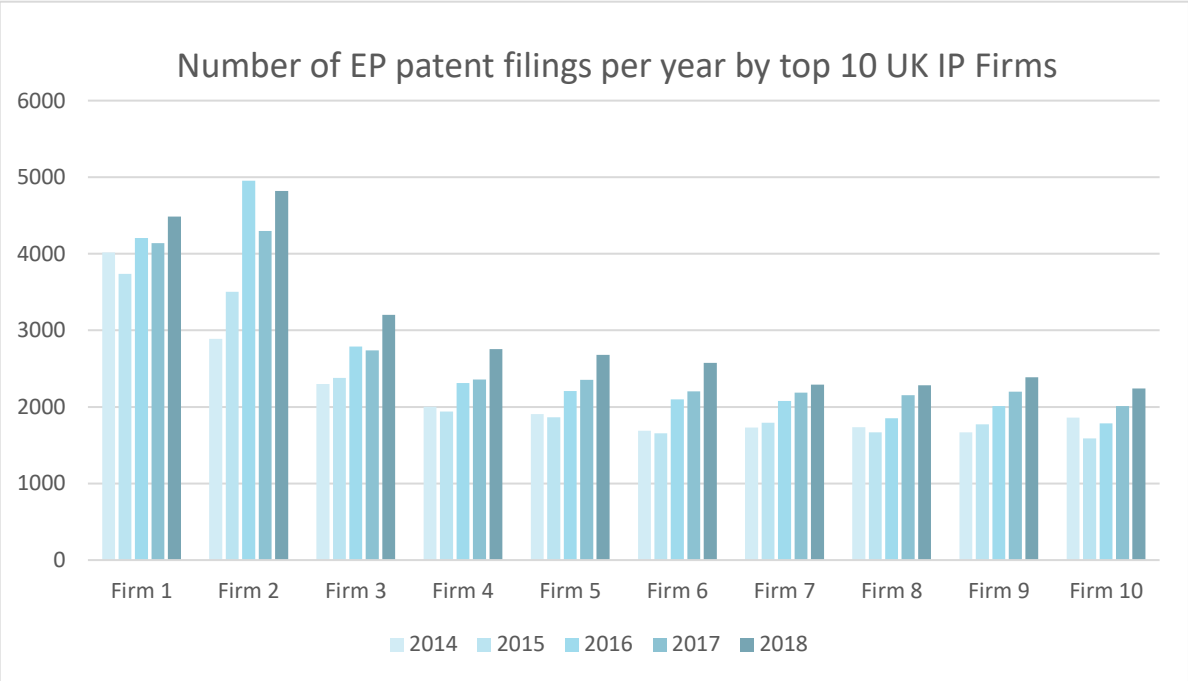

Figure 4 – Chart displaying the number of EP patent applications per year for 10 of the top UK patent law firms

As can be seen, all 10 firms have experienced significant increases in patent numbers over the time period, with most firms seeing growth rates of 30-50% over the 5-year period. Across the board, the 2014-2015 shows the weakest growth, with many companies actually seeing a decrease in publication numbers between 2014 and 2015. Excepting the top 3 firms, there is little variance between the number of publications for each firm, suggesting they are of a similar size with similar amounts of client activity.

Firm 2 also shows some interesting activity, with a large spike in activity in 2016. Assuming that growth over the 5-year period is otherwise similar to the other top 10 firms, the number of publications in 2016 is approximately 1200 more than predicted. This type of spike may be suggestive of either the firm acquiring a large new client or a merger/acquisition by one of Firm 2's existing clients, whereby the client has inherited a large back catalogue of patents in a short period of time, for which the client has changed the representative to Firm 2.

3.1 PRIORITY COUNTRIES OF EP PATENT FILINGS

Looking at the priority data for the EP patent filings in the previous section can yield some useful data with regard to the inventors/assignees. As priority applications tend to be filed in the applicant's country of origin, looking at the priority countries of a patent law firm's EP filings can give a good indication as to which countries they receive their business from (either directly or through a reciprocal arrangement with a law firm in that country). The graphs in ***Figure 5*** show the priority countries for the EP patents (and by extension the origins of business) of the 10 UK patent law firms in 2014 and 2018, respectively.

Figure 5 - Chart displaying the priority countries of EP publications in 2014 and 2018 for 10 of the top UK patent law firms

In 2014 we can see that, for nearly all of the patent law firms, the US was the most popular country for priority applications by a considerable margin. Indeed, for some firms (e.g. Firms 2, 7, 9) the number of EP filings originating from a US priority application far outstripped the combined total of priority patents from the rest of the IP5, indicating that the vast majority of the EP patents from these firms are filed on behalf of US-based clients. Several of the firms also had significant business from Japanese clientele, in some cases rivalling the amount of business coming from the US (Firms 4 & 8). Firms 1, 5 and 6 also received the bulk of their business from a combination of US and Japanese clients.

However, with the exception of Firm 3, business from South Korea and China was almost non-existent at this point in time. The low numbers of EP priority patents across the board is perhaps not surprising, considering that most priority applications will be national filings rather than regional. Firm 10 did however have a significantly larger proportion of EP priority patents than any of the other UK firms.

By 2018 we can see growth in EP patent numbers from all priority areas, although perhaps most noticeably in the number of US priority filings (steady, strong growth in an already established market). Firms 2 and 6 have seen huge growth in US business, with both firms seeing over 65% increase in business from American clients, and Firm 8 has also seen a 60% increase over the same 5-year period.

Numbers of Japanese clients have also increased, although it seems that only those firms that already had significant Japanese portfolios have seen much growth over the 5-year period (Firms 1, 4 and 5). Firms 6 and 8 seem to have focused more on growth in the American market, as numbers of Japanese priority patents have increased by only 17% over the 5-year period for Firm 6, and Firm 8 has actually seen a 49% decrease in business from Japan .

However, more important is the growth in patent (and therefore presumably client) numbers from previously untapped markets such as China and South Korea. While absolute numbers of EP filings from these priority countries is still very low (<150 for most firms), growth rates for patents from these areas outstrip other protection countries by an order of magnitude, such as Firm 2 seeing a 700% increase in its Chinese client portfolio, and Firm 9 with a 5400% increase in its Korean portfolio. Such large growth cannot be purely attributed to increased output of existing clients, making it likely that UK firms have acquired new Chinese and Korean clients with significant patent portfolios. These could be entire portfolios of SMEs, or portfolios of a division of a large company.

4 EP PATENT FILINGS FOR GERMAN IP FIRMS

While EP patents can be filed from almost everywhere in Europe, the vast majority since 2014 have been filed from Germany. While patent filing numbers for the other European countries (aside from the UK) can for the most part be put down to domestic companies, the huge numbers of patents filed in Germany can only be explained if German patent law firms, like UK firms, are receiving significant amounts of business from outside their own borders. This paper therefore also looks at the filing habits and trends of 10 of the top EP filing German Patent Law firms (Firms A-J). A German patent law firm is defined as one with its headquarters in Germany, although it may have offices elsewhere around the world.

The graph below details the number of EP patent publications over the 2014-2018 period where these firms were listed as the representative. As can be seen, all 10 firms saw a period of growth in business from 2014-2018, although the rate of growth does differ substantially between firms (4% for Firm E vs 92% for Firm J). 2015 again seems to have been an uncharacteristically weak year, perhaps most notable in Firm E, which has maintained an almost identical number of patents every year since 2014 except for an 11% drop in publications in 2015. There are also significant differences in the number of publications even within the top 10 firms, suggesting either a fair degree of variance in the size of these patent law firms, or that some of these firms represent the entire patent portfolios of a small number of large clients.

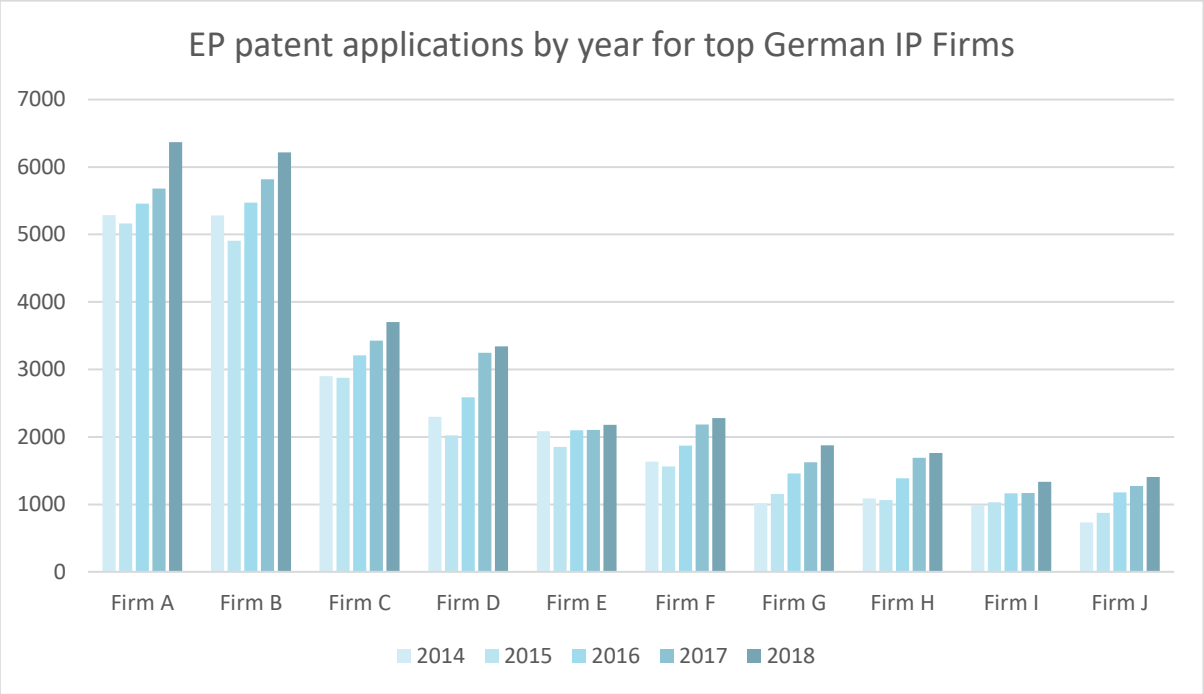

Figure 6 - Chart displaying the number of EP patent applications per year for 10 of the top German patent law firms

4.1 PRIORITY COUNTRIES

As with the UK firms, analysis of the priority data from EP patents where the 10 German firms were listed as representatives gives an indication as to the sources of their business. The graphs in ***Figure 7*** show the priority countries for the EP patents (and by extension the origins of business) of the top 10 German patent law firms in both 2014 and 2018.

In 2014 we can see that for most of the top 10 firms, Japanese clients provided the bulk of their EP patent business, with some firms having more business from Japanese clients than from all other IP5 areas combined (Firms A, B, E, F), and Firm E collecting its business almost exclusively from Japanese clientele (96%). Most of the firms also have a strong American client base, and several of the top filing firms also have significant amounts of business originating in South Korea (Firms B, C, D). However, while some of the firms do look to have business originating from China (D, G, H), the numbers of patents filed on behalf of these clients tend to be small (circa 200), and most of the firms have negligible Chinese-originating portfolios.

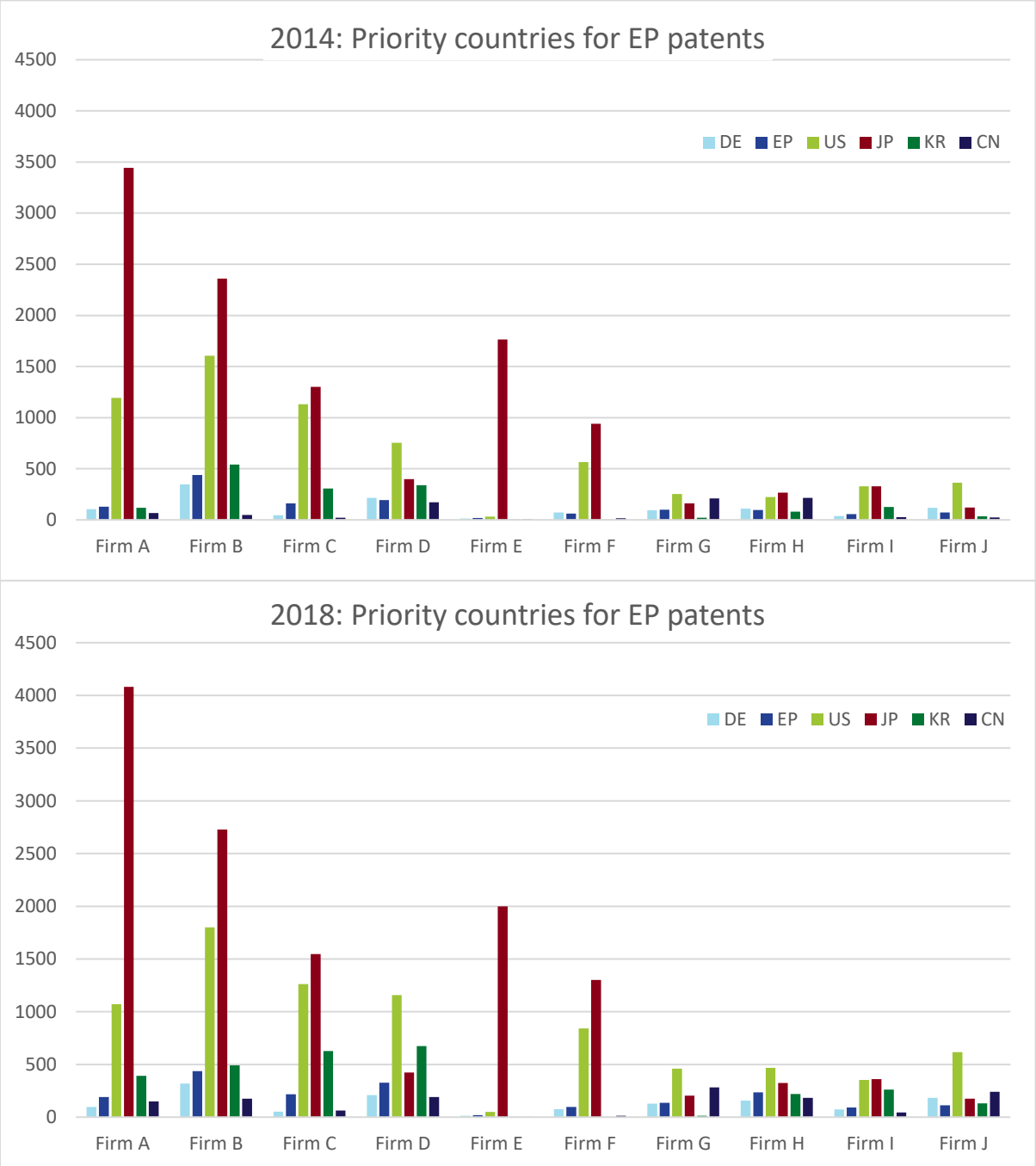

Figure 7 - Chart displaying the priority countries of EP publications in 2014 and 2018 for 10 of the top German patent law firms

By 2018, numbers of patents from all regions has increased for nearly all firms. Numbers of Japanese priority patents has in general seen only small growth over the 5-year period (10-20%), although Firm F saw growth of 68%, making it by far the fastest grower in terms of Japanese business, For the rest of the firms, the relatively small growth is likely to be related to growth of existing clients' portfolios rather than the acquisition of large new clients. Numbers of EP patents with US priorities has seen highly varied changes based on the law firm, with some firms seeing over 60% increases, while others (Firm A) have actually seen decreases in business from the US. Since it is unlikely that US companies no longer want the protection of an EP patent, this decrease

in numbers is more likely due to the movement of business to other patent law firms, either in Germany or elsewhere in Europe. Volumes of business from Korean and Chinese clients have seen the most improvement, and in several cases patents originating from these areas now form a significant part of the firm's business. For instance, Firm D saw a 98% increase in business from Korea from 2014 -2018, which now accounts for 22% of all their patent filings. While other firms saw greater proportional increases in business from Korea (e.g. Firm A with 230% increase and Firm J with 271%), for these other firms the Korean business still forms a very small part of their overall business.

Firm J saw a 943% increase in Chinese business over the same time period, and its share of business originating from China increased from 3% to 16%. In much the same manner as for the UK firms, these sharp increases are indicative of increased numbers of clients from these countries. However, this increase in business from China and Korea does not appear in all cases. Firms E and F seem to have focused themselves on increasing business in territories they are already established in i.e. Japan and the US, and have seen almost no business come from China or Korea across the entire 5 year period (< 1% of patents represented by firms E or F have priorities from either of these countries).

5 COMPARISON OF EP PATENT FILINGS FOR UK AND GERMAN IP FIRMS

5.1 NUMBER OF EP PATENT FILINGS

While we have seen that the largest filing firms are based in Germany, the chart in ***Figure 8*** shows that there seems to be a significant gap in size between the very top German firms and the rest of the top 10, with the bottom end of the top 10 having approximately 20% of the business of the largest German firms.

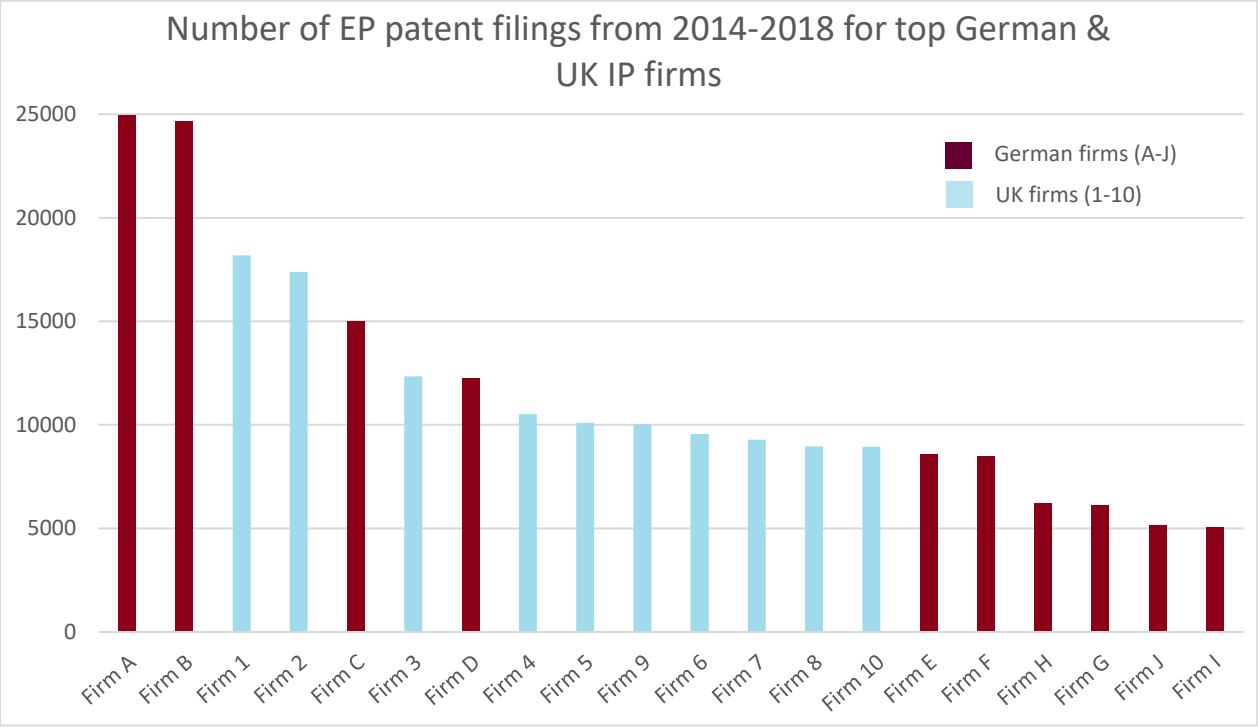

Figure 8 – Chart displaying the number of EP patent applications from 2014-2018 for the top German and UK firms

5.2 PRIORITY COUNTRIES FOR EP PATENT FILINGS

Comparing the priority countries of the EP applications gives an indication as to the relative proportions of business coming from those territories. Looking initially at the Top 10 firms, we can see that the UK firms seem to have a monopoly on business from US clients, whereas German firms have a similar monopoly on Japanese business. Shares of business from Korea are less clear cut, although Germany may have the edge on Korean business, with Firms A, B, C and D all receiving fair amounts of business from Korea by 2018. By contrast, only Firm 3 from the UK has comparable numbers of Korean priority patents to the top German firms indicating that, whilst there has been growth in the Korean market amongst UK firms, they are still considerably behind their German counterparts.

For both the top UK and German firms, China was an almost unexplored market in 2014, and the market size was still considerably smaller than the other key territories by 2018, although the number of patents represented by the top German firms was still 65% higher than those represented by the top UK firms. However, growth amongst UK firms was strong across almost all firms, with only Firms 1 and 9 seeing little to no increase in business. By way of contrast, most of the growth amongst the German firms was limited to Firms A, B, C and J. This is highlighted by the observation that combined, the top 10 German firms saw a 68% increase in business from China over the 5-year period, whereas the UK Firms saw 212% growth over the same period, albeit from a lower starting point.

With regards to the differences in shares of business from US, the most likely reasons why the top UK firms have a monopoly over US business are on cultural and historical grounds. The US and the UK have a shared culture and a shared language, and have historically been close, so it would be unsurprising that US firms would choose to work with UK firms over German firms. Formal or informal reciprocity agreements may also play a part, as US patent law firms are more likely to have close ties with UK firms, and are therefore able to provide US business for them.

However, when it comes to Japanese and Korean business, culture and history may be less important. Both UK and German firms are similarly disadvantaged here, dealing with clients of a wholly separate culture, with no shared language and little shared history. The reason why clients from these countries gravitate towards using German firms may be to do with the proximity of these firms to the European Patent Office.

The European Patent Office deals with the search, examination, eventual grant and potential opposition of every European patent application ever made. As such, when choosing a patent law firm on purely practical grounds (as would be the case for Japanese and Korean clients), the most logical decision would be to choose a firm in close proximity to the EPO, as they are more likely to know how to best navigate the patent granting process, and would have more experience in dealing with oral and opposition proceedings. This is evidenced by the fact that, out of the top 10 German firms, 7 are headquartered in Munich, with a further 2 having a satellite office in the city.

While the geographical advantage offered to German patent law firms may seem insurmountable, in recent years the top UK firms have attempted to level the field by opening up their own satellite offices within Munich. By 2018, 9 of the top 10 UK firms had an office in Munich, indicating that they were aware of the advantages that proximity to the EPO would give them. However, in most cases these satellite offices tend to be fairly small. While investment in the Munich satellite offices has increased over the 5 years, with several of

the UK firms expanding their Munich teams, it is clear that the advantage the German firms have has not been significantly eroded.

Since the behaviour of the top ten UK and German firms is not necessarily indicative of the general patent industry as a whole, in order to verify the observations made above, the scope of searches has been expanded to include all EP patents filed by patent representatives in the UK and Germany. The graphs below show the priority countries for all EP patents filed. This includes patents filed by in house attorneys as well as those from actual patent law firms.

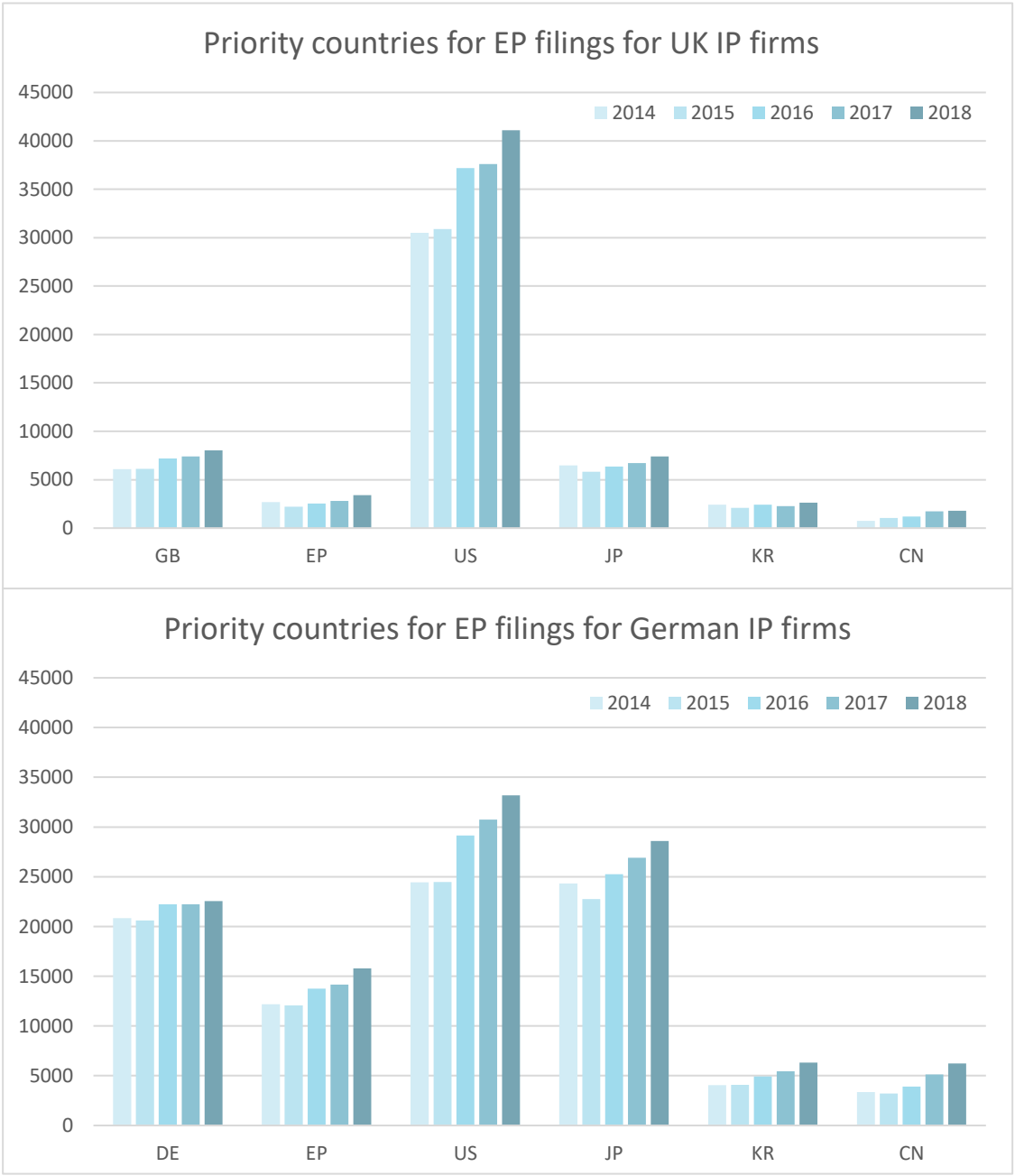

Figure 10 – Charts displaying the priority countries of EP publications from 2014-2018 for all UK and German IP law firms respectively

When comparing the wider filing landscape to that of the top 10 firms, the most notable difference is in the volume of US business, as the data suggests that the UK monopoly is not as large as the data of just the top 10 firms would otherwise indicate. The likely reason for this is that the number of German patent law firms far outstrips the number of UK firms, meaning that while the average number of US priority patents might be low amongst German firms, the sheer number of German patent law firms means that the total business from the US is higher than the data on the Top 10 firms would suggest.

While relative proportions of Japanese and Korean business fall broadly in line with the data from the top 10 firms, German firms look to have considerably more business overall from Chinese clients. This could be due either to the relatively large number of German patent law firms as mentioned above, or it could be the case that the are some German firm who work mainly with Chinese clients, but who would not appear on the Top 10 list due to the relatively small size of the Chinese market. It is worth noting that, while German firms have significantly more business in terms of numbers of patents, the growth amongst the UK firms (139%) still outstrips that of the German firms (86%). This however may be due in part to the comparatively small size of the Chinese market in the UK initially in 2014, at approximately ¼ of the size of the equivalent market in Germany at the time.

Another discrepancy is in the number of domestic priority patents. Amongst the top 10 firms, it seemed that the UK firms dealt with greater numbers of domestically filed patents than their German counterparts. However, when looking at all patents filed, it is clear to see that there are far more DE priority patents than GB ones. The most likely reason for this is the fact that the total data includes patents filed by in-house attorneys, and that several of the largest EP-filing companies (e.g. Bosch, Philips) are based in Germany and file almost exclusively via in-house representatives. The (often significant) patent portfolios of these and other domestic companies would therefore not appear in the data on the Top 10 firms. Additionally, amongst the top 10 German firms, proportions of EP priority patents tend to be higher than those of DE priority patents. This is in contrast to the trend across all filed patents, suggesting that the top firms may advise their clients to file directly for an EP patent, rather than initially filing a DE patent.

5.3 IPC CODES FOR PRIORITY APPLICATIONS RELATED TO EP PATENT FILINGS

The International Patent Classification (IPC) provides a hierarchical system of language independent symbols for the classification of patents and utility models according to the different areas of technology to which they pertain. The IPC divides technology into eight sections with approximately 70,000 subdivisions. The appropriate IPC symbols are indicated on each patent document, of which more than 1,000,000 were issued each year in the last 10 years.

It is useful to look at IPC codes of the priority documents of the EP applications, as this will give an indication as to the main technological areas of innovation within those countries. When combined with the data on all UK and German patent law firms from the above charts, this can help determine whether UK or German law firms are preferred when it comes to different technological areas.

Since the US and Japan are the largest priority countries for both UK and German firms, this section will focus on the IPCs of the priority applications from these countries from 2014-2018. The market size for China and

Korea is still too small for any meaningful analysis to be carried out, so this section will not mention priority applications from these countries.

The pie charts in ***Figure 11*** represent the top 10 4-character IPC codes of all the US-priority EP patent applications represented by UK and German firms. In both cases, the top 10 IPCs are found in around 60% of applications.

Overall, the IPCs are very similar between the UK and German firms, with 9 IPCs appearing in both the patents represented by the UK and German firms. The only difference in the top 10 is the inclusion of **C07D** (Heterocycles) with the UK firms, whereas **A61M** (Devices For Introducing Media Into, Or Onto, The Body) appears for the German firms.

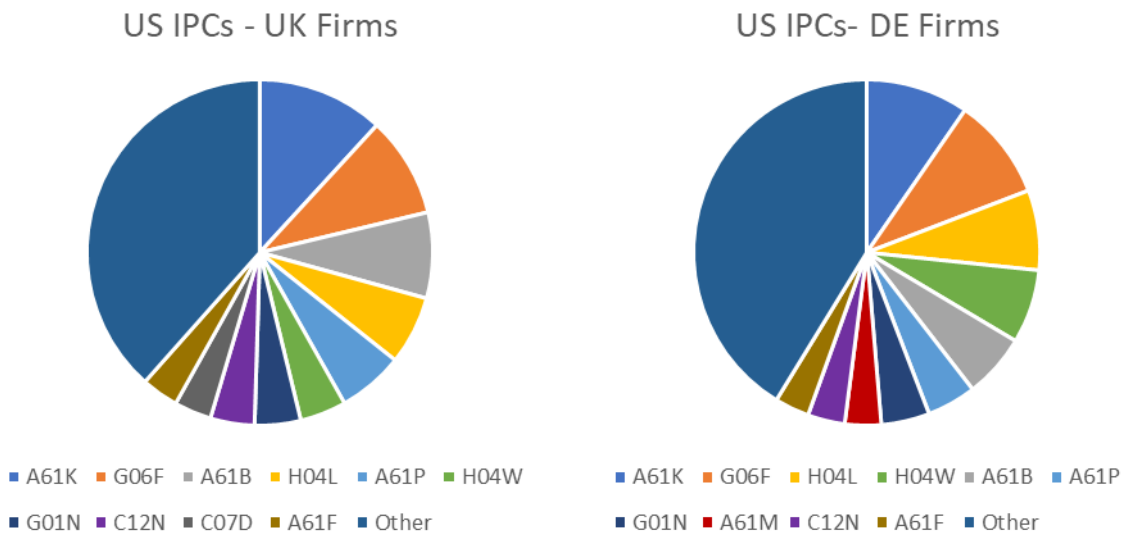

Figure 11 – Pie charts comparing the top IPC Codes of EP patents with US priority applications represented by UK or German patent law firms

Within the top 10 IPCs, it appears that the UK firms attract more business from medical and therapeutic technologies (**A61B, A61K, A61P**) from the US, with approximately 29% of patents having one or more of these IPCs. Contrastingly, only 23% of the patents represented by German firms are classified by one or more of these IPCs.

On the other hand, US companies with technologies concerning transmission of digital information or wireless communication (**H04L, H04W**) are slightly more likely to be represented by German firms, with 14% of patents represented by German firms belonging to these IPC subclasses. These IPCs only appear in 10% of US priority patents represented by UK firms.

The Japanese priority patents tell a slightly different story. The charts in ***Figure 12*** represent the top 10 IPC codes of all of the Japanese-priority EP patents. For these patents, the top 10 IPCs only represent 40-50% of the whole patent base, indicating that the Japanese priority patents have more varied technological background than their US counterparts. Additionally, the variation in IPCs between the two representative countries is greater, with only 7 of the top 10 IPCs being shared between them.

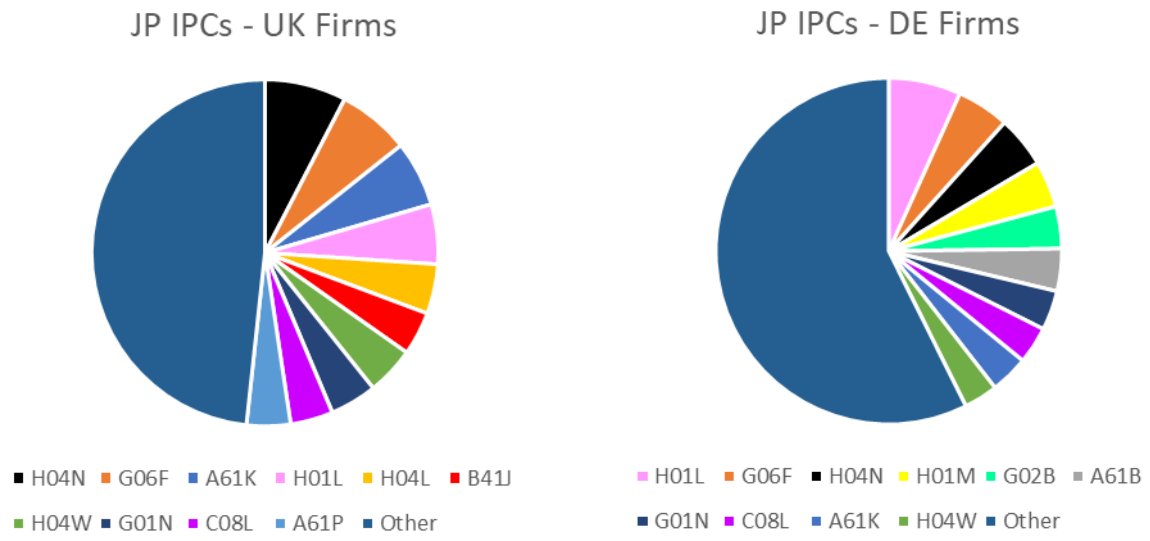

Figure 12 – Pie charts comparing the top IPCs of EP patents with JP priority applications represented by UK or German patent law firms

The UK firms have **H04L** (Transmission of digital information), **B41J** (Typewriters; Selective Printing Mechanisms) and **A61P** (Specific Therapeutic Activity Of Chemical Compounds Or Medicinal Preparations) within the top 10 IPCs, whereas these are replaced by **H01M** (Processes Or Means, E.G. Batteries, For The Direct Conversion Of Chemical Energy Into Electrical Energy), **G02B** (Optical Elements, Systems, Or Apparatus) and **A61B** (Diagnosis; Surgery; Identification) for the German firms.

Amongst the top 10 IPCs, for both the UK and German firms the cast majority of patents are in some way related to digital technologies (H04N, H01L, H04L, H04W, G06F), reflecting Japan's main areas of innovation. While the UK firms do seem to do proportionally more work with medical and therapeutic patents (A61K, A61P) than their German counterparts, it should be mentioned that in terms of raw numbers, the German firms still deal with significantly greater numbers of patents with these IPC codes.

5.4 IP FIRMS REPRESENTING TOP ASSIGNEES FOR EP FILINGS

As well as looking at the biggest patent law firms in the UK and Germany, we have also looked at some of the biggest assignees of EP patents over the 2014-2018 period and the patent law firms that they used. The graph in ***Figure 13*** details the headquarter countries of the patent law firms used by some of the most prolific patent filers, and the proportion of patents represented by said firms.

This data clearly illustrates that most of the business generated by these firms goes to German law firms, with only Samsung, GE and Google having more patents represented by UK firms than German ones. Sometimes the reasoning for a company's choice in patent law firm is obvious - for a German assignee such as Siemens, it is only natural that they would choose to be represented by German patent law firms.

The relative proportions for Japanese, Korean and Chinese companies also are consistent with the analysis thus far, with more patents being dealt with by German firms than by British. Samsung remains as the only

exception. The US companies broadly follow the trends previously identified, with the portfolios being shared between British and German firms. Of particular interest however is Intel, a US company whose EP patent portfolio is largely managed by German patent law firms. The remaining 20%, while not being represented by a German firm, are actually dealt with through the German offices of a British firm. Intel's entire EP patent portfolio is therefore represented by various patent law firms in Germany, suggesting that in some cases, geographical location is indeed the deciding factor when choosing a European Patent Attorney.

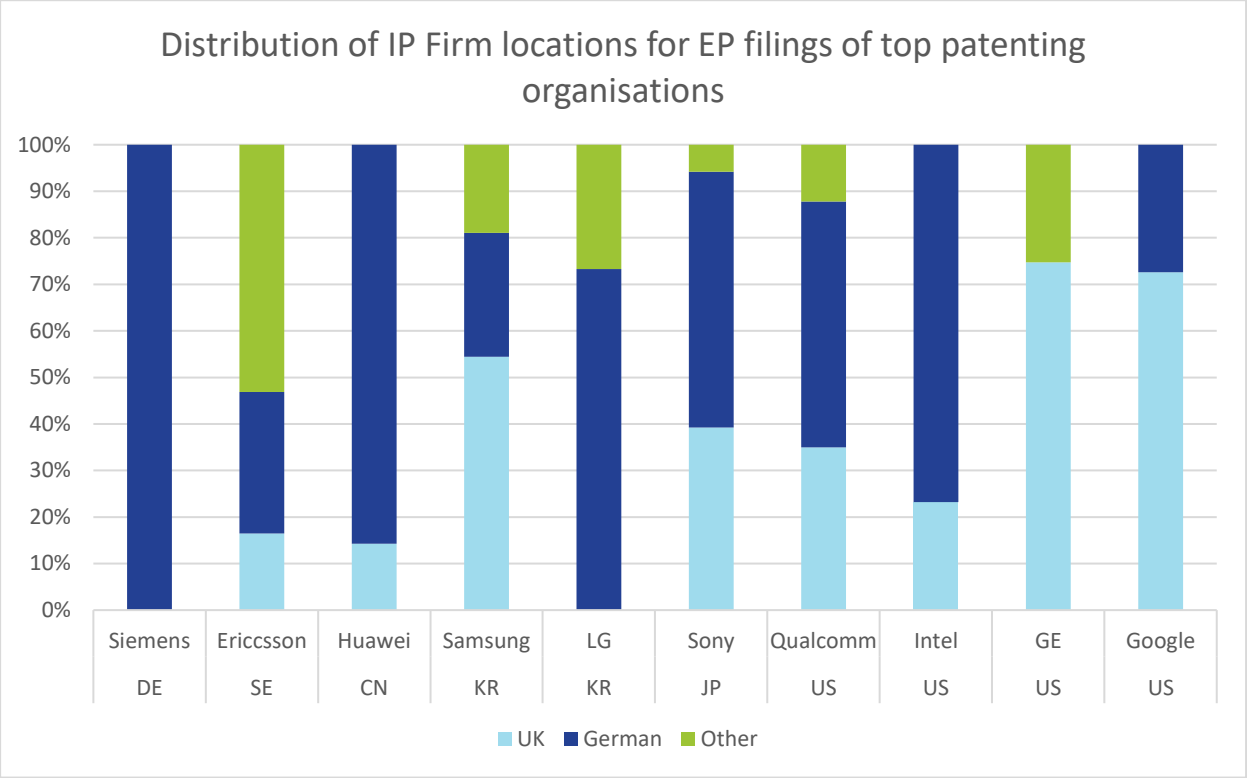

Figure 13 – Chart displaying the relative percentages of EP patents represented by attorneys from UK, Germany or other countries for companies with large EP patent portfolios

It is important to note that the data within the graph omits patents for which the representative attorney is a direct employee of the assignee company. Firms like Bosch and Philips, while being amongst the top EP filers, file almost exclusively via in house attorneys, so are not included in the analysis.

6 CHANGES IN ATTORNEY

From time to time, companies will change their representative patent attorney firms. While this may be for a variety of reasons, e.g. conflicts of interest, budget changes, dissatisfaction with the results of the existing attorneys etc, any change in representative presents an opportunity for rival firms to acquire new business.

In this section we look to identify if and how the base country of the firms used by some of the top assignees from Japan, Korea and China has changed over the period from 2014-2018.

6.1 JAPANESE COMPANIES

As can be seen from ***Figure 14***, in most cases Japanese companies are mainly represented by German patent law firms, with only Fujitsu and Ricoh having a greater proportion represented by UK firms. Additionally, over the 5-year period, approximately half of the companies have seen little to no change in the nationality of their representatives. Of the remainder, Toyota and NEC have seen large increases in the proportion of patents represented by UK firms, suggesting that business was moved from German attorneys to UK ones. Conversely, the opposite can be seen for Sony and Fujitsu, where German firms seem to be taking business from UK firms. In the case of Toshiba, the proportion of business to German firms remained stable over the 5-year period, but firms of other nationalities, such as French and Italian firms, seem to have taken some patent business away from UK firms.

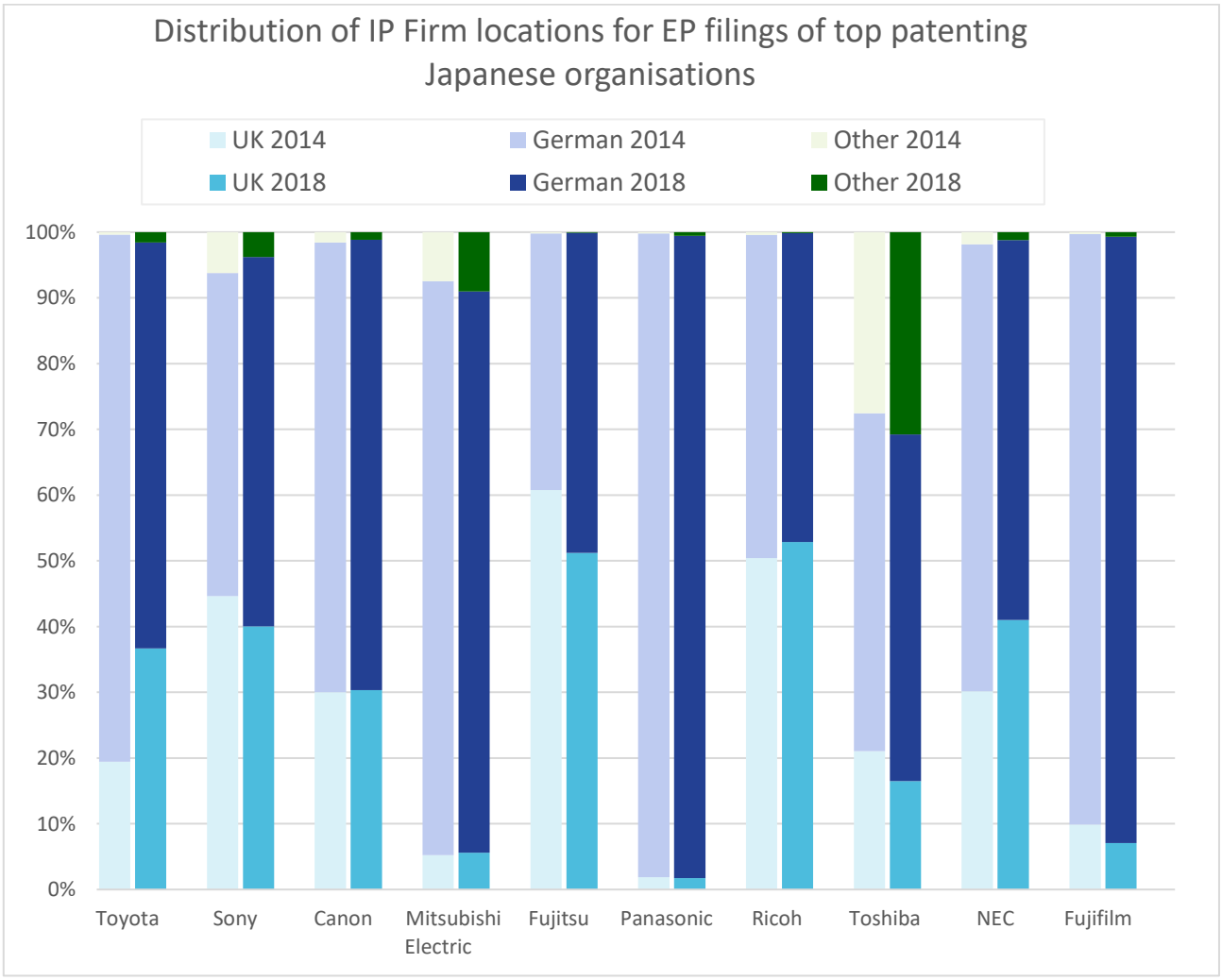

Figure 14 – Chart displaying the relative percentages of EP patents represented by attorneys from UK, Germany or other countries for the highest patenting Japanese companies

It is important to note that the data cannot be used to determine if a company has changed attorney firm within the same country e.g. from one German Attorney to another. Additionally, some changes may be due purely to the shifting of a portfolio from one regional office to another within the same patent law firm.

6.2 KOREAN COMPANIES

While there are fewer Korean companies with significant EP patent portfolios, the pattern seen amongst the highest filing companies broadly matches the analysis in previous sections, with the majority of patents being handled by German law firms.

As can be seen from ***Figure 15***, Samsung seems to be the only exception to this, although over the 5-year period the proportion of business handled by UK firms has decreased to less than half of all its EP patent filings. Indeed, the UK firms seem to have underperformed with regards to Korean business, with only business from LG showing any increase. While German firms have fared better, with increases in business from LG, Hyundai and Posco, it seems that the larger Korean companies have branched out into using patent law firms from countries such as France, Italy and the Netherlands. Both Samsung and LSIS have seen significant increases in patents being handled by firms from other countries, and over 25% of LG's portfolio is still handled by non-UK, non-German firms (although this proportion has decreased since 2014).

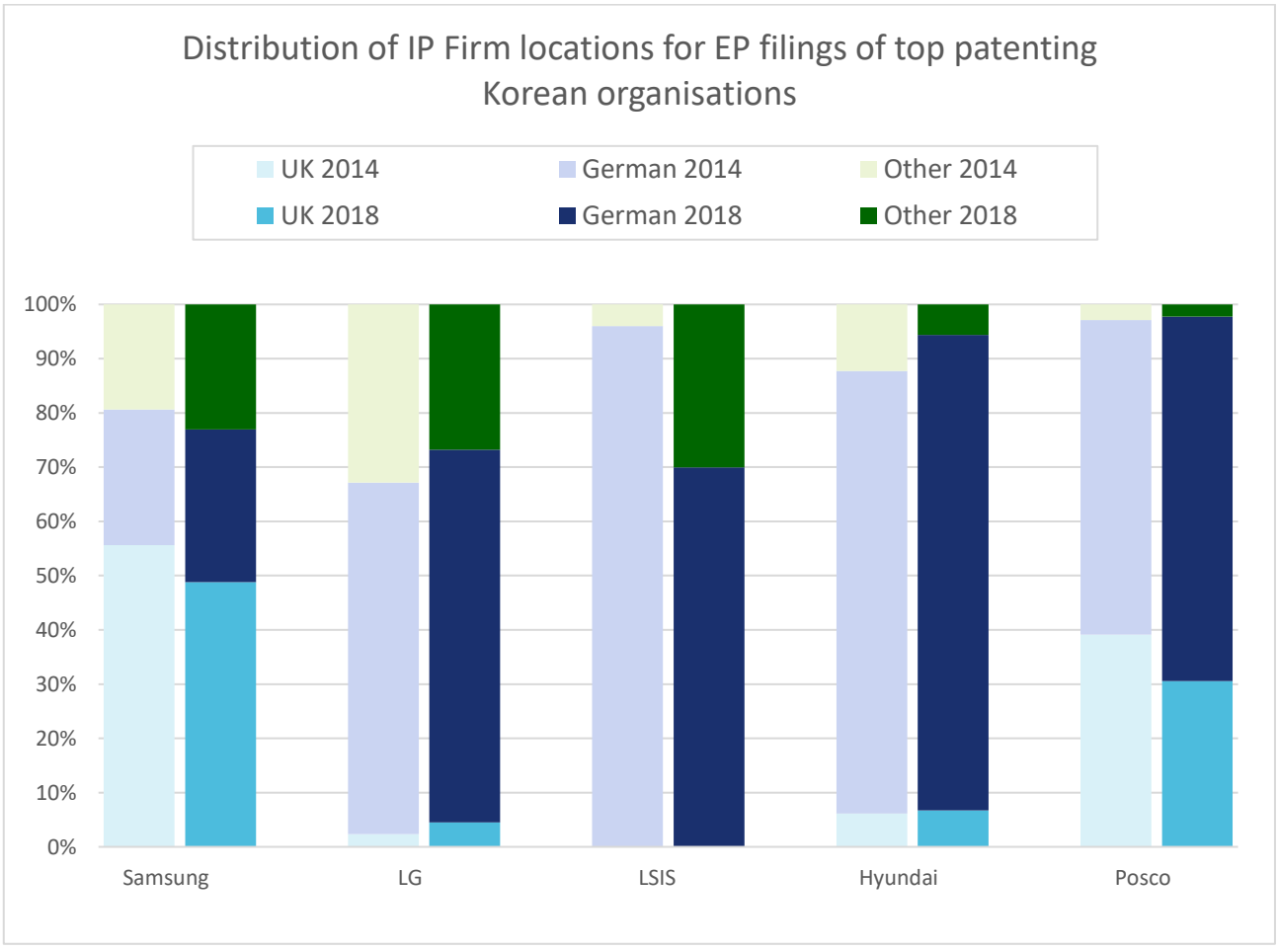

Figure 15 – Chart displaying the relative percentages of EP patents represented by attorneys from UK, Germany or other countries for the highest patenting Korean companies

6.3 CHINESE COMPANIES

As seen in ***Figure 16***, the trend amongst Chinese companies is much the same as with Korean companies, with the majority of patent business being handled by German firms. The only exception to this is ZTE, a telecommunications company who seem to have split their business fairly evenly between UK, German and other country firms.

Over the 5-year period, there seems to have been very little movement in terms of nationalities of law firms used. Huawei and BOE have both seen increases in the amount of business dealt by UK firms, with a corresponding decrease in German business. The apparent large shifts in movement by Oppo are mainly due to the fact that only 2 EP patents were filed on their behalf in 2014, as opposed to approx. 350 in 2018. It is also worth noting that, although the increased proportion of UK business from Huawei may look small, in fact Huawei have filed more patents over the 5-year period than the other 4 top Chinese companies combined. Therefore, the apparent small proportional increase in business to UK patent firms corresponds to a large increase in terms of raw patent filings. The relatively small filing numbers from Chinese companies (with the exception of Huawei) verify the findings that Chinese companies are still warming up to the idea of patenting in Europe, rather than being as fully invested as Japanese firms.

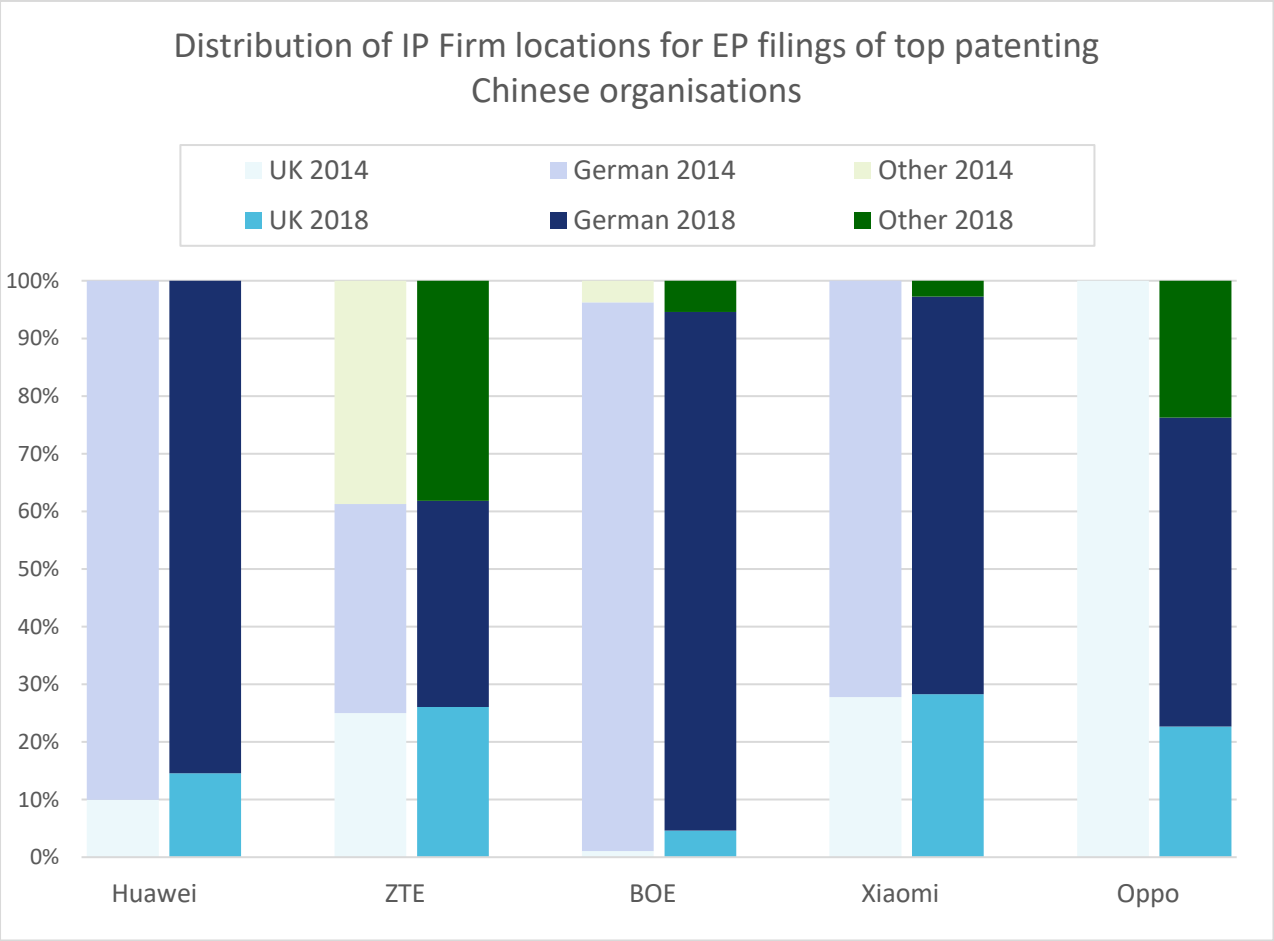

Figure 18 – Chart displaying the relative percentages of EP patents represented by attorneys from UK, Germany or other countries for the highest patenting Chinese companies

7 CONCLUSION

Overall, from 2014 to 2018 there have been increasing numbers of EP patent filings from all over the world, although the US and Japan are still the largest priority countries for EP patents. Korean and Chinese companies have also entered the European patent market, and growth from these sectors has seen the largest acceleration. However, they still make up only a small proportion of all EP patents filed.

Amongst the top patent law firms from the UK and Germany, we can see that the UK firms still receive most of their business from American clients. The top German firms, however, deal mainly with Japanese companies, with some receiving nearly all of their business from Japan. Several of the German companies do also have a significant portfolio of American clients. For both UK and German companies, growth in patent filings from Korean and Chinese companies has seen the largest proportional increase, although in most cases this still only makes up a small percentage of their overall business. German law firms still do far more business with companies from the Eastern hemisphere than UK firms, and this may be due to the location of the European Patent Office in Munich, as attorneys located in Munich are more likely to have increased experience in dealing with oral proceedings and oppositions, as well as being more familiar with EPO procedure as a whole. Overall, both UK and German firms have seen increased business from Japan, Korea and China, but UK firms still lag behind their German counterparts.

In terms of technological background, life sciences patents tend to be dealt with more by UK patent attorneys, whereas patents in the fields of computing and digital technology usually fall in the hands of German attorneys. This may be in part due to the nationalities of their clientele, as many of the patents from Japan, Korea and China are more technologically focused than those from the western hemisphere, which has a thriving life sciences industry.

Amongst top Japanese, Chinese and Korean assignees, changes in nationality of attorney are being seen, but not overwhelmingly to any one country, and not with all companies. This may either indicate that most changes of representative are intranational rather than international or that UK and German patent firms are evenly matched when it comes to poaching clients from other attorneys. However, while Japanese companies still overwhelmingly use either German or UK attorneys, Korean and Chinese companies have been more open to working with firms from other European countries, such as France, Italy and the Netherlands. Over the 5-year period many of the top companies from these countries have increasingly used non-UK, non-German patent law firms, suggesting that competition for these clients has become more complex.