Patent Box: Incentivising UK Innovation

An industry report on the Patent Box initiative and its impact on UK innovation
<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>Foreword</td>
</tr>
<tr>
<td>04</td>
<td>Introduction</td>
</tr>
<tr>
<td>06</td>
<td>Economic Perspectives</td>
</tr>
<tr>
<td>07</td>
<td>The state of UK innovation</td>
</tr>
<tr>
<td>11</td>
<td>How Patent Box works</td>
</tr>
<tr>
<td>13</td>
<td>The effects of Patent Box - Industry Response</td>
</tr>
<tr>
<td>16</td>
<td>Financial implications</td>
</tr>
<tr>
<td>18</td>
<td>Conclusion</td>
</tr>
</tbody>
</table>
Patent Box has the potential to deliver significant benefits for UK companies involved in the commercial exploitation of patented technology. However, as a new scheme there is still some uncertainty over its strategic impact on the UK economy and how the intended beneficiaries can take full advantage of the scheme.

In response to the growing interest in the scheme from our client base and the wider technology community, Cambridge Design Partnership has teamed up with University of Cambridge Judge Business School and international Patent Attorneys Marks & Clerk to create this report. We wanted to get some real insights into what the scheme means to its target audience, rather than undertake a ‘dry’ appraisal of the new legislation. Consequently, the research undertaken by the Judge students includes interviews with some of the UK’s leading technology businesses, which provide a fascinating window into how the scheme is being considered.

Whilst Patent Box was conceived to address macro-economic indicators, we wanted to deliver a report with relevance to our primary audience of technology-based companies, and establish how they can use it to maximise net profits. Patent Box is generous in that Corporation Tax reduces from 23% to 10% and all profits accruing from a product (no matter how large or complex) which encompasses a single patented invention qualify for the relief. Therefore the drivers for creating patented inventions now include favourable tax treatment as well as protecting innovations from competitors.

This new tax environment has a positive impact on the payback calculations for companies embarking on new product development initiatives, whether they are run by in-house teams or outsourced. The schemes value is increased further where consumable items are tied to the product, as these revenue streams qualify for relief. Patent Box also presents an incentive to assess existing product portfolios for opportunities to update and incorporate patented features and to reappraise the value of latent intellectual property.

UK policy makers have identified science and technology as a driver in the push for increasing domestic growth, and Patent Box is the latest in a growing number of Government initiatives aimed at supporting the sector. The key for unlocking the full potential of this new scheme is what already keeps successful companies ahead of their competitors: access to ideas, creativity and the engineering expertise to translate a concept into a patented product which is valued by the market. A principal aim of Patent Box, which we at Cambridge Design Partnership applaud, is to retain and build the skills required for this process in the UK.

We would like to thank Bassel Namih and Edward Cronan of the Judge Business School, who undertook the research with such enthusiasm and rigour, and Philip Martin of Marks & Clerk, who provided guidance and support to them during the project. Given the high levels of interest in the report we plan to undertake an on-going annual appraisal of Patent Box, based on the benchmark metrics used for this first report.
Despite green shoots, with continued troubles in the Eurozone and financial difficulties felt by companies across the UK, decisive action is necessary to spur growth among our SMEs and our corporates. In the Government’s Patent Box initiative, we see a promising move to encourage growth through innovation.

Although many UK companies understand that they have to out-innovate their competition if they’re going to stay ahead, many do not realise the legal protection for their innovations that is available to them and the extra benefits it bestows. Patents are available for a range of different inventions – from new diagnostic methods, to software, to pharmaceutical compositions – and they grant the exclusive right to commercial use of the patented invention for 20 years. What is more, this report shows that using Patent Box can increase the net present value of an innovative new product (if patented) by almost 10 per cent, even when the costs of patenting are taken into account.

Patents and other intellectual property rights have many other uses than simply preventing the competition from copying your inventions. Patents are now treated as assets in their own right, and can be bought, sold or monetised in other ways. A patent portfolio is also something that investors and banks look for when considering investment, loans or other financial agreements.

In reality, the savings afforded by Patent Box are simply the icing on the cake for those that realise the value of protecting their inventions, but we hope that it will galvanise those UK businesses that are not familiar with the patent system to commercialise their innovations. It has been a pleasure for Marks & Clerk to contribute to this report, which lays a foundation to revisit and assess the continuing impact of the scheme in years to come.
This report explores this new scheme, which began on 1st April 2013, and provides an understanding of its effects at a company, industry and national scale. We aim to measure background levels and practices for UK innovation prior to the scheme, and devise metrics for its measurement before its effects are seen.

Quantitative data from patent databases, company financial reports, the UK Intellectual Property Office and European Patent Office, in combination with qualitative insights from executives in companies ranging from major multinationals to UK small and medium enterprises (SMEs) provide the basis for our conclusions. Trends in patent filing information from Belgium, Luxembourg and the Netherlands (Benelux) from their introduction of comparable schemes were examined, and indicate a significant increase in patent filings.

High patent coverage in larger corporations leads to lower strategic effects but higher realisable gains. Benefits to the UK economy from these sources are likely to be related to decisions on international localisation of intellectual property (IP) and the accompanying jobs. Smaller corporations with lower patent coverage will see greater effects on strategy but find the scheme harder to employ. Gains under the scheme will need to be better understood in order to motivate changes in patenting behaviour and to push non-patenting firms to engage with IP ownership.

Patent Box is a new UK Government initiative designed to promote innovation – (innovation being defined as ‘the commercial exploitation of new ideas’).

Patentability is used as a test for innovation and a reduced corporation tax charge is applied to revenue derived from products that incorporate innovative technology, as displayed by intellectual property. The relief is being phased in over five years, reducing corporation tax from 23% to 10%.

To realise the social benefits of increased innovation it is important that companies of all sizes understand the gains to be made under Patent Box, illustrated in part by sample net present value calculations in the section on financial implications. These calculations show that the reduction in the corporate tax rate can be of substantial value and can outweigh the cost of patenting including the cost of technology and product development.

In order for the scheme to realise its potential it is important that businesses of all sizes reassess their IP practices and place innovation at the top of the agenda, which can in part be achieved by promoting a greater understanding and awareness of the scheme’s effects.
The aim is to provide an additional incentive for companies in the UK to retain and commercialise existing patents and to develop new innovative patented products. This will encourage companies to locate the high-value jobs associated with the development, manufacture and exploitation of patents in the UK and maintain the UK’s position as a world leader in patented technologies.

HMRC, 2011

Patent Box is an innovation incentivisation scheme enacted by deductions to tax bills for qualifying companies. Innovation is promoted by a reduction in corporation tax for profits from products or services that benefit from inclusion of an innovative feature, represented by qualifying IP. In the UK’s scheme corporation tax on qualifying profits will ultimately be reduced to 10%. In this manner the scheme hopes to specifically reward those who engage in the commercial exploitation of research, unlike the R&D tax credit scheme which focuses on the generation of R&D as an end unto itself.

The UK is a world leader in terms of the amount and quality of research undertaken as measured by papers published and number of citations received, but historically has failed to fully exploit its strength in research to create positive economic outcomes at a national level. Fu & Yang (2009) analyse differences in patenting between countries and conclude that the UK’s low patenting capacity and efficiency relative to its research base is indicative of issues regarding the ‘translation of ideas into commercial practices’. The Patent Box aims to address this shortfall and provide a further incentive for companies to exploit new ideas, as well as compensating for the cost of the patenting process itself.

Patentability provides a sound, independent test for the novelty and utility of innovations, and so is a logical foundation for an incentivisation scheme. This allows the usage of the extensive infrastructure already in place for patent assessment to double up as a mechanism for assessment of innovation for tax purposes. The initiative has been praised for being efficient in design, as discussed in the Industry Response section of this report; however it is important to understand that patenting is not a perfect indicator of innovation.

The UK joins eight other countries to have introduced a Patent Box, or Innovation Box, as it sometimes termed. There are variations in the qualifying elements of IP, requirements for development and ownership and the tax deductions available, but the core message remains the same: promotion of innovation and generation of IP. HMRC predicts that the scheme will provide £1.1 billion in tax relief by 2019, equivalent in value to the R&D tax credit programme.

The Patent Box scheme is a key piece of legislation for UK innovation and growth prospects. It is therefore important that the implications and effects are well understood in order to allow both individual companies, and the country as a whole, to benefit.

HMRC predicts that the scheme will provide £1.1 billion in tax relief by 2019.

---

1HMRC (2011). Consultation on the Patent Box
2UK Department of Business, Innovation & Skills (BIS). (2011). International Comparative Performance of the UK Research Base
As the scheme was introduced on 1st April 2013, it is still too early to measure a response in the activity of UK businesses. However, Belgium and Luxembourg began similar innovation tax deduction schemes in 2008 and the Netherlands introduced their scheme in 2007. Changes in the number of patent applications from residents of the ‘Benelux’ countries in particular (rather than all applications to a given office) may provide an insight into the extent to which companies in the Benelux countries have been incentivised to increase innovation, and from this, the sort of reaction that can be expected to the UK scheme.

Figure 1a shows the total number of patents filed by applicants from the Benelux countries to their respective national patent offices and the European Patent Office (EPO) combined. There is a 3% decline in patents filed from 2005 to 2007, followed by an 8% rise in 2008. This increase was seen for all three countries, both in applications to the national offices and the EPO.

A comparison can be made with a sample of the highest patenting countries which did not enact Patent Box schemes over the same time period. Figure 1b shows the total number of patents filed by applicants from the UK, the USA and Japan to their respective national patent offices. In contrast to the Benelux countries, applications show an 8% rise from 2005 to 2007, followed by 5% fall in 2008. The fall in applications in 2008 and 2009 is most likely attributable to the financial crisis.

This data indicates that following the introduction of the Benelux Patent Boxes, there was a rise in the number of patent applications within these countries, whilst patent applications fell in countries that did not introduce similar schemes. This may suggest that the schemes provided a sufficient incentive for firms to increase patenting, and by proxy, innovation. When using national statistics it is difficult however to control for other factors that may have influenced the level of patenting, most notably, the economic recession, which may have had a differential effect on countries. Poor economic conditions in Europe may be responsible for the subsequent falls in patent applications from Benelux countries in 2009 and 2010, obscuring possible Patent Box effects.

It should also be noted that the details of each of the schemes vary and that the Benelux countries may not be analogous to the UK. In particular, Luxembourg’s scheme may have been aimed at encouraging multinationals to relocate IP for tax purposes, rather than to stimulate innovation per se. Whilst comparisons with the Benelux countries seems to suggest that the UK will see an increase in patenting as a result of Patent Box, additional metrics can provide greater understanding of its effects.
In order to gauge the effects of Patent Box on UK innovation, it is important to pre-establish a set of intuitive metrics that allow measurement of changes in a company’s activity. This can prevent post-hoc rationalisation and assumptions regarding the effects of the initiative.

We selected a set of sample companies, embodied by the FTSE techMARK Focus. Total revenues for firms in the techMARK have been roughly constant since 2010. Total spend on research and development has increased at an average of 4% annually for the last five years, having dropped sharply by 10% from 2007 to 2008. R&D intensity, defined as the proportion of revenues spent on R&D, for selected techMARK firms in 2012 is shown in Figure 2a.

Electronics and healthcare companies tend to have higher R&D intensities, whereas telecommunications companies and those operating in the general industrial sector tend to spend a lower proportion of revenue on R&D. In general, there has been a gradual decline in R&D intensities across all sectors over the last six years, and for the techMARK as a whole, as shown in Figure 2b.

Declining R&D intensity may be a concern if UK businesses want to maintain a leadership position in the quality of R&D. Future data will indicate whether Patent Box has increased R&D spend as a proportion of revenue; this will in part be affected by companies’ decisions regarding whether to specifically reinvest tax deductions from the scheme in innovation.

The number of patent applications published by the techMARK can also be considered, both in absolute terms, and in conjunction with R&D data. The number of patent applications published over the period 2010 to 2013 by the techMARK is shown in Figure 3 (see page 09). It can be seen that the total number of patent applications published has declined gradually year on year, though this may in part be attributable to the publishing lag in the patenting process. The majority of publications are attributable to a minority of larger firms, even in this index of valuable publicly listed businesses.

If businesses do not increase R&D spend, but choose to increase patent activity then the average R&D spend per patent can be expected to fall. In 2010 the average cost per patent for each firm, averaged over the whole sample, was £3.30m. Subsequent annual data will be more greatly affected by publication lag. The average cost per patent was generally consistent across all sectors, though was larger for companies in software or internet services.

\(^5\)techMARK Focus firms with R&D intensities over 80% in 2012 are excluded: Ark Therapeutics Group, Emblaze, Oxford Biomedica, Torotrak & Vectura Group

\(^6\)2013 data includes applications up to 28/05/13
Figure 2: Data from companies’ Annual Reports

<table>
<thead>
<tr>
<th>Year</th>
<th>Aerospace/Defense</th>
<th>Computing/Electronics</th>
<th>Consumer</th>
<th>Health</th>
<th>Industrials</th>
<th>Software/Internet</th>
<th>Telecommunications</th>
<th>techMARK average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>0.28</td>
<td>0.26</td>
<td>0.24</td>
<td>0.22</td>
<td>0.20</td>
<td>0.18</td>
<td>0.16</td>
<td>0.14</td>
</tr>
<tr>
<td>2008</td>
<td>0.20</td>
<td>0.18</td>
<td>0.16</td>
<td>0.14</td>
<td>0.12</td>
<td>0.10</td>
<td>0.08</td>
<td>0.06</td>
</tr>
<tr>
<td>2009</td>
<td>0.16</td>
<td>0.14</td>
<td>0.12</td>
<td>0.10</td>
<td>0.08</td>
<td>0.06</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>2010</td>
<td>0.12</td>
<td>0.10</td>
<td>0.08</td>
<td>0.06</td>
<td>0.04</td>
<td>0.02</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>2011</td>
<td>0.10</td>
<td>0.08</td>
<td>0.06</td>
<td>0.04</td>
<td>0.02</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>0.08</td>
<td>0.06</td>
<td>0.04</td>
<td>0.02</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. R&D Intensity for selected techMARK firms in 2012

b. Average R&D intensity by sector for the techMARK
Figure 3: (from p8): Heatmap for patent applications published from 2010 to 2013 for techMARK Focus firms. Data from LexisNexis® TotalPatent®.
The total number of patents applied for can be normalised across businesses and sectors by taking into account both R&D spend and company revenue. This gives a measure of the change in patent activity with regards to a particular R&D strategy (represented by the R&D intensity). An increase in the ratio of patents to R&D intensity might be expected if companies want to maximise the potential gains from their R&D and account for the new, additional incentive to patent. Looking at trends in the patent number per unit of R&D intensity for the techMARK using two separate sources and search strategies for patent publication data\(^7\), a downwards pattern is apparent. While this trend may be partly attributable to publication lag we may expect this figure to increase over the next few years as companies seek to maximise rewards from the legislation by increasing patenting and innovation.

A final metric that may indicate a change in company behaviour is the proportion of patents that provide eligibility for Patent Box. Figure 4 shows the proportion of patent publications\(^8\), 2007 to 2013, for the techMARK, by qualifying national and international patent offices (see Patent Box Practicalities). The average proportion of patents with qualifying patent offices for the techMARK was 0.28. This figure may be expected to increase over the next few years. It should be noted however that this does not account for proportionate Patent Box coverage of products or profits.

---

\(^7\)Two different search strategies (set of search strings under applicant field) were employed using two different patent databases: LexisNexis® TotalPatent\(^\circ\) and the European Patent Office Global Patent Index.

\(^8\)Data from the EPO GPI database used, due to greater national patent office coverage. Figures are compatible alongside those from TotalPatent\(^\circ\) as proportions are used.
Patent Box operates under a number of distinguishing criteria, and has been commended for the simple application guidelines in comparison to both Patent Box schemes in other countries, and the UK R&D Tax credit scheme, whose uptake was hampered by poor understanding of eligibility under the scheme’s complex rules. The limitation of the scheme to patents is a key element of this simplicity.

Another key feature in this administrative simplicity is that only one patented feature is needed for all profits from the product to be taxed at the lower rate. In addition to patent holding, an exclusive license can be used to qualify profits for Patent Box.

Unlike the R&D Tax credit, Patent Box operates as a ‘super-deduction’ - profits derived from products containing qualifying IP become eligible for the 10% rate, excluding profits derived from valuable marketing assets or routine activities. For most companies, the proportion of qualifying product profit eligible for the lower rate will be around 80%, though this may rise where brand is less important such as in business-to-business selling.

Where patent coverage is not absolute over a company’s offerings they can choose whether to apportion profits as revenue, or whether to stream profits separately, if they believe the qualifying profits generate a greater proportion of the company’s profit than revenue. In some cases streaming may be mandated.

For services or processes, notional royalties are calculated to give the proportion of the value generation attributable to the intellectual property. With regards to avoidance, the scheme will ignore those occasions where the patented item has been incorporated into the product without a commercial rationale.

The 10% Patent Box tax rate will be phased in over four years, with 60% of the deduction available immediately to those entering Patent Box. For patent applications, tax deductions can be applied in full retrospectively once a patent is granted.

### Basic Patent Box Tax Deduction Example

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Calculate the gross income from trading for the relevant accounting period</td>
<td>£10,000,000</td>
</tr>
<tr>
<td>2</td>
<td>Calculate the percentage given by dividing relevant IP income by gross trade income</td>
<td>£8,000,000 / £10,000,000 = 80%</td>
</tr>
<tr>
<td>3</td>
<td>Apply the percentage to the total profits</td>
<td>80% x £1,500,000 = £1,200,000</td>
</tr>
<tr>
<td>4</td>
<td>Remove routine returns (10% of certain trading expenses) to generate the qualifying residual profit (QRP)</td>
<td>£120,000 x 90% = £1,080,000</td>
</tr>
<tr>
<td>5</td>
<td>Exclude profits from brand and marketing: Small claims treatment means the lower of 75% QRP or £1m becomes the relevant IP profits. RIPP can also be calculated by removal of a notional marketing royalty (NMR).</td>
<td>Choose Notional Marketing Royalty Method</td>
</tr>
<tr>
<td>6</td>
<td>Where QRP is above the small claims level NMR is normally used to generate arms-length value of marketing assets under OECD guidelines. This is also ignored if under 10% QRP.</td>
<td>NMR is under 10% QRP (typical for B2B selling) Relevant IP Profits = £1,080,000</td>
</tr>
<tr>
<td>7</td>
<td>Apply Deduction formula to RIPP: RIPP x (MR-IPR)/MR where MR is the main tax rate and IPR the Patent Box rate</td>
<td>£1,080,000 x (23-10)/23 = £610,435</td>
</tr>
<tr>
<td>8</td>
<td>Apply Patent Box phase-in percentage (2013 : 60%, 2014 : 70%, 2015 : 80%, 2016 : 90%)</td>
<td>£610,435 x 60% = £366,261</td>
</tr>
</tbody>
</table>

First year tax deduction

---

9HMRC Research Report 101 (2010). Qualitative research into businesses’ R&D decision-making process
Active Ownership
The active ownership condition is designed to eliminate passive IP holding companies. For a company within a group to qualify profits for Patent Box, where another group company is responsible for the development, it must be actively involved in managing its patents.

HMRC defines active IP management as the following: the company must ‘be involved in the planning and decision making activities associated with developing or exploiting substantially all of its qualifying IP portfolio’[10].

Such activities could involve integrating the invention into products, licensing, patent maintenance or researching alternative applications for the innovation.

Development Condition
The active development condition exists to limit the benefits of Patent Box to companies fostering innovation. In order to satisfy the development condition companies must contribute significantly to the patented invention or the product or service incorporating it. This contribution could be in the form of time, effort or finance. Qualitative assessment means a significant contribution could also be indicated by value or impact on the final offering.

Significance is not defined as majority contribution: it is possible for several parties to contribute significantly, and indeed this will be the case where development is outsourced or commissioned[11]. In the case of group companies it is sufficient for another company in the group to have engaged in qualifying development if the patent possessing company can be shown to be engaged in active ownership.

Qualifying European patent offices

<table>
<thead>
<tr>
<th>EPO</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>Hungary</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>Poland</td>
</tr>
<tr>
<td>Estonia</td>
<td>Portugal</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>Romania</td>
</tr>
<tr>
<td>Denmark</td>
<td>Slovakia</td>
</tr>
<tr>
<td>Finland</td>
<td>Sweden</td>
</tr>
</tbody>
</table>

In order to gain an understanding of the new legislation’s potential impact, a number of interviews were conducted with R&D experts, IP managers and tax directors in senior roles at techMark businesses and multinational enterprises (MNEs). The general consensus was that Patent Box was unlikely to affect R&D intensity or have a major impact on the level of patenting activity for these companies, particularly where the product patent coverage was already high.

However, some reported that in certain cases, Patent Box would be a consideration in R&D and patenting decisions, particularly with regard to completing eligibility of the product portfolio and new product development. Others believed that the scheme underscored the importance of filing UK patents, particularly considering the greater value in litigation represented by US patenting. The issue of where to hold IP and conduct firm operations in the future was divisive, with opinions dependent upon the sector within which the company operated.

To better characterise the full range of companies that could stand to benefit from Patent Box, a survey was conducted of MDs and R&D heads at a number of SMEs. The general view was held that more needed to be done to specifically encourage and enable innovation in smaller companies.

Interviews (techMARK and MNEs)

All of the interview participants had been aware of Patent Box for a number of years. Some companies had been informed about the scheme by their patent attorneys who had been involved in the Government consultation before HMRC’s public announcement; others had themselves been part of the consultation. Preparation, in the form of producing coverage maps and assessing the extent of product eligibility, had generally commenced in the last twelve months, particularly after the final draft of the legislation.

R&D practices and the impact of the new legislation

Rather than rigid strategic plans, the technology firms tended to have road maps outlining the R&D intended to take place over the next three to five years. Industry leaders in this space engage the R&D team, marketing department and finance department in road map reviews covering all products as often as twice-weekly. Here, R&D is the primary focus, and sales, marketing and other firm activities are support functions, giving rise to R&D intensities of approximately 30%. In this context, interviewees foresaw little to no change in R&D activity: “It’s a very fast moving industry, even before Patent Box we had to innovate to survive.”

An R&D head within an MNE in the fast moving consumer goods (FMCG) space pointed out that as a company driven by marketing, not technology: “Brand developers discuss the strategy of the brand, and from there the technology is aligned. Within the brand strategy is a technology roadmap.” So here too, Patent Box would do little to affect R&D decision-making. An interviewee working within the industrials sector reported that R&D intensity and product development were driven by product cycles that were determined by the market, and so Patent Box would have little effect on the extent and timing of R&D: “We’re always looking to disrupt the market.”

That being said, a company’s Patent Box eligibility chart may generate pressure on engineers to innovate in a particular area. Businesses that did not already have close to complete patent coverage on products would look to get the remainder ‘in the Box’, which would therefore feed into the R&D decision-making process. In particular there was an incentive to generate widely applicable patents that could cover large product ranges easily.

Patenting practices and potential changes under Patent Box

All companies interviewed were committed to patenting as widely as possible. MNEs are top patenters: “constantly patenting at all levels”, where almost all products contain patents. They exemplify the extreme end of patenting behaviour. Some of the technology companies contacted conduct a weekly review of all the work carried out by engineers. In this labour intensive process, anything that is found to be potentially patentable is investigated further, and a patent filed if possible. This is accompanied by a patent bonus incentivisation scheme for engineers.

“Even before Patent Box, we had to innovate to survive.”
A marketplace occupied by highly litigious competitors meant that for one interviewee, a defensive portfolio was necessary, giving the business a credible threat to return litigious action by competitors.

Given the commitment to patenting that already exists amongst larger firms, they are well positioned to maximise benefits from Patent Box. One interviewee highlighted that: “IP is already a priority, so there is a natural synergy”. Several believed that it would help raise the profile of the IP process, and the value of innovation, within the firm, reducing concerns about the costs outweighing the potential benefits.

Several emphasised that the high cost of filing and maintaining patents meant that for financially constrained companies maximising commercial benefit would be a priority: “If Patent Box hadn’t come in, we may not have filed as much in the UK. We may have just focused on overseas patents, as that is where our biggest threats lie. It has made us ensure that we also have UK patents on our portfolio going forward.”

In particular, the USA was highlighted as the market where companies felt most at threat from litigation. Data from the UK IPO shows a falling trend in applications from within the UK over the last six years, suggesting that the existence of limited resources available for patenting may be causing businesses to prioritise patent activity in other countries.

Not only will Patent Box encourage businesses to maintain UK patents, but for companies that have IP distributed globally due to acquisition-driven growth, it will result in a consolidation of IP in the UK over the next few years. One director interviewed said that: “looking to move offshore IP to the UK is something that I believe we will do, and I think that is also something the Treasury wanted to stimulate.”

Therefore, for companies that already patent widely, Patent Box will reinforce and refocus patenting efforts. In cases where filing for patents in the UK may have started to move down the agenda, it will provide further reason to patent in the UK (in addition to it providing a reliable and cheap first search).
Business operations in the future

Most of the electronics companies that were interviewed believed that Patent Box would have some impact on decisions over where to locate operations in the future. They acknowledged that: “there were times when we asked ‘is it better for us to hold our IP in other countries’, like Singapore, or in Ireland.” Tax efficient practices for international localisation have come under scrutiny recently with firms such as Apple facing the US Senate, and Google facing criticism in the UK.

Whilst some European countries such as Ireland and Luxembourg look to shed their reputations as tax havens, the UK clearly faces pressure to provide a hospitable tax environment for large businesses.

Within the sample of businesses that were interviewed, the issue of where to carry out operations produced differing opinions. One interviewee asserted that: “Patent Box has secured our presence in the UK... because this is now a friendly place to hold IP.”

By contrast another believed that the UK was playing ‘catch-up’ with other countries that had already introduced similar schemes, pointing out that: “we need one [Patent Box] just to level the playing field”, and that greater incentives would be needed to compete with the lower cost of conducting R&D overseas.

In addition to tax considerations, some interviewees highlighted other, overriding factors regarding where they locate operations. For one, world-leading expertise in a given technology area was the driving force behind relocalisation in recent years. It is likely that there will be an interactive effect between the UK’s areas of technology leadership and the favourable business environment created by Patent Box, together promoting innovation and the location of the high-tech jobs in the UK, as desired by Government.

Survey of SMEs

Respondents to the survey were MDs and R&D heads of small and medium enterprises in the energy, biotechnology, IT and technology sectors. They were asked questions regarding the level of R&D and patenting activity of the company, whether they were aware of the new legislation and if they believed it would affect their business activities.

Almost all reported having R&D roadmaps that were reviewed at least annually. In half of the companies, the roadmaps were reviewed more than four times a year. Approximately a third were yet to commercially exploit their work, and those that did reported revenues ranging from several hundred thousand to £25m. For companies that were producing revenue, the R&D intensity was high, with a range of 20% to 100%, and an average intensity of 56%. Financial constraints and a commitment to a current product or strategy were the two main reasons given for why more R&D was not conducted.

Interestingly, approximately half of the firms had a product patent coverage of less than 10%, whilst the remainder had coverage of over 90%. Only one company had an intermediary patent coverage. This suggests that small businesses may choose either to fully commit to patent any potential IP, or to avoid the process almost altogether. One respondent expressed that the patenting system was largely inaccessible to smaller companies due to the perception of prohibitive costs of application, maintenance and enforcement for meaningfully large patent portfolios.

The majority of respondents disagreed or disagreed strongly with the statement that “the UK Government offers enough incentives for innovation”, and fewer than half had heard of the Patent Box scheme.

Nearly all of those interviewed, when asked about the legislation’s potential to aid SMEs and start-ups, acknowledged that given the scheme concerned tax relief on profits made, and lacked the provision of patent loss relief in the form of cash, it would most likely be of limited benefit to companies in the early stages of growth. Survey respondents pointed out that they needed help in overcoming the obstacles they faced in trying to convert R&D into innovation. One respondent highlighted in particular the difficulties faced when SMEs and academia apply jointly for grants.

For SMEs that have achieved a high product patent coverage, Patent Box will provide a more favourable environment for growth and therefore increased investment in innovation. For start-ups yet to become profitable, R&D tax credits and agencies like the Technology Strategy Board remain the primary assistance available on the path to commercialisation.
To provide insight into the financial effects of the Patent Box tax deduction on the innovation decisions that companies face in the real world, we’ve created two stylised business scenarios:

**NPV PD: Net present value of product development**

This scenario aims to illustrate the effects that Patent Box has on the profitability of new product development. Under the new scheme the profitability of innovation is increased, meaning that greater returns on investment in product development may lead to altered strategic priorities. From this case study it is also clear that the Patent Box tax deduction more than compensates for the up-front and ongoing cost of patenting - this is particularly relevant to small businesses concerned with the costs associated with patenting.

**Now, Later, Never: The financial effects of timing of Patent Box entry**

This scenario aims to illustrate the strategic importance of immediately realising the reduced tax rate available from Patent Box. This means that there is an imperative to apply for patents on innovative features as soon as possible, in order to be eligible for backdated tax relief when a patent is granted. It may also be necessary to reassess product development roadmaps, bringing forward future re-development to enable products to enter Patent Box as soon as possible.

Net present value of product development

This scenario focuses on a start-up B2B company. The company is assumed to have a gross margin of 40% on the device and to have operating costs equivalent to half of their gross profits. From the timeline of events below the following figures are derived:

- **Net present value of profits, minus cost of development:** £339,455
- **Net present value of tax deductions, minus cost of patenting:** £32,120

2013: The business invests £50,000 in developing a new product and pays £5,000 to apply for a patent with the UK IPO. No profits are made.

2014: The business sells 100 units at £400 each. The business generates £8,000 in profit: £800 is removed as routine returns, but as the business is B2B and not reliant on marketing there is no further reduction from the £7,200 qualifying residual profit (QRP), giving relevant IP profits (RIPP) of £7,200 also. The business cannot claim the Patent Box deduction until the patent has been granted however.

2015: The business sells 1,000 units now and generates a RIPP of £72,000; this is also rolled over.

2016: The patent is granted, at additional cost of £5,000 involved in communications with the UK IPO. 1,500 units are sold and an additional £108,000 in RIPP added. With the patent now granted the deduction can be applied. The accumulated RIPP figures, adjusted by the relevant phase in percentages, amount to £159,840, providing a £15,984 tax deduction from the business’ £24,000 corporate tax charge for the year.

2017: Sales rise to 1,800 and £12,960 is removed from the business’ £28,800 tax charge. If the previous year’s deduction had exceeded the tax charge it could be rolled over to this year.

2018 & 2019: With sales at 2000 units the corporate tax charge is reduced from £32,000 to £17,600.
**Underlying Assumptions:**
Both calculations ignore the effect of R&D tax credits, use arbitrary figures for profitability and assume an accelerated patenting process. These figures are only illustrative, and designed to show how Patent Box can benefit businesses. Both examples calculate cash flows up to 2019, though Patent Box will continue to benefit businesses after. The costs of patent maintenance from the fifth to twentieth year are not represented, but can be assumed to be insignificant in comparison to the benefits derived from Patent Box. Discounting of cash flows is carried out at a discount rate of 8%.

As addressed in the Industry Analysis section, companies may find themselves adjusting development roadmaps or otherwise seeking to increase patent coverage in the short term in order to realise these benefits.

---

**Now, Later, Never**
This scenario focuses on a mature business incorporating a patentable feature into an existing product line and thereby qualifying the revenue stream for Patent Box. No direct benefits from the innovation undertaken accrue to the company in this case, in order to highlight the financial effects of just the Patent Box scheme. In reality we will expect revenue to increase where there are product improvements from the customer’s perspective. In this case higher rate corporation tax is applied. The benefits of redeveloping the product to incorporate a patentable feature, even without an increase in revenue, are quite substantial:

Immediate redevelopment, as laid out in the timeline below has an NPV of £83,048, inclusive of the £110,000 cost of development and patenting. Delaying by two years (‘Later’) reduces this benefit to £32,120. This is relative to the £0 NPV generated by no redevelopment (‘Never’).

From this we can see that even where all benefits of innovation accrue to the public not the company, or there are no realised benefits for either party, there is still a significant financial gain for the company when engaging in product redevelopment to incorporate a patentable feature. As addressed in the Industry Analysis section, companies may find themselves adjusting development roadmaps or otherwise seeking to increase patent coverage in the short term in order to realise these benefits.

---

**There is a significant financial gain for the company when engaging in product redevelopment to incorporate a patentable feature.**

---

**2013:** The company redevelops the product to incorporate a patentable feature at a cost of £100,000 and applies for a UK patent for a further £5,000 and elects to enter Patent Box. The corporate tax charge is £138,000 at the 23% rate.

**2014 & 2015:** The business generates £600,000 in qualifying profits, giving £540,000 qualifying residual profit (QRP) after removal of routine returns, and relevant IP profits (RIPP) of £486,000 after removal of profits attributable to brand and marketing each year. These amounts are rolled over until patent grant. The corporate tax charge drops to 21% and 20% respectively each year under current Government plans.

**2016:** Under an accelerated patenting process the patent is granted, incurring a further £5,000 in costs in communication with the UK IPO. The business incurs a £120,000 corporate tax charge in this year, however the accumulated RIPPs since the patent application are combined at the relevant phase in percentages to provide the Patent Box deduction, which amounts to £116,640. This reduces the corporate tax charge to £3,360.

**2017:** The company continues to generate an RIPP of £486,000. The Patent Box deduction of £48,600 reduces the tax charge to £71,400. If the deduction had exceeded the tax charge in the previous year the company could have chosen to roll it over to further reduce this tax bill.

**2018 & 2019:** The company continues to generate the same RIPP, and the standing Patent Box deduction of £48,600 continues to reduce their corporate tax charge from £120,000 to £71,400.
Patent Box is likely to lead to increased patenting by companies seeking to qualify more of their profits for Patent Box. In the short term the gains are likely to accrue to larger businesses with long periods of preparation and high coverage and revenue. Even where these companies do not directly reinvest savings in R&D there may be spill-over effects in the localisation of IP, and thus jobs, to the UK, leading to an indirect increase in innovation.

SMEs must be made aware of the scheme for the direct promotion of innovation and alteration of business level strategy to occur. We can expect many first time patent filers who will stand to benefit greatly from large accumulated tax deductions when their patents are granted towards 2017. As HMRC have chosen to institute a scheme based on patenting, we suggest that to ensure fair uptake across business sizes, effort is made by HMRC to increase understanding of the patenting process by smaller businesses, perhaps even to proffer an example tax deduction figure on a business by business basis to make clear the financial benefits relative to the cost of patenting. This could also be taken up by accountancy firms.

Smaller businesses, even if able to take advantage of Patent Box, may not be adequately supported in their innovative efforts by the UK Government. Work with the Technology Strategy Board to bring companies to the point of patent ownership may be beneficial. In particular, mechanisms to bridge the gap between the world-leading research within UK universities and the small innovative start-ups created to commercialise their ideas could help create economic growth through innovation.

Part of HMRC’s stated aim for the initiative is that it ‘should encourage companies to locate the high-value jobs associated with the development, manufacture and exploitation of patents in the UK.’ Considering this goal it is perhaps useful to investigate mechanisms to encourage corporations to reinvest money saved under the scheme in the UK, in innovation or both. This could be undertaken by a condition on R&D expenditure or, for the larger businesses, on a case by case basis, in order to prevent public misconception of the scheme as only beneficial to MNEs.

The scheme has rightly drawn praise for its simplicity of application and for putting innovation higher on the corporate agenda. In coming years metrics based on patenting statistics and research and development expenditure, in addition to reporting on the strategic decisions of the UK’s companies, large and small, will inform as to the consequences for innovative activity in the UK and the resulting economic outcomes. As we plan to report annually on the Patent Box initiative, to attempt to measure its effectiveness going forward, we hope to see an increase in UK innovation as a result.
Cambridge Design Partnership

Cambridge Design Partnership is an innovative research, design and development consultancy working in the consumer, healthcare and cleantech markets. For over 16 years, we’ve created value for clients by converting innovative ideas and technology into breakthrough products and commercial success.

From offices in Cambridge and Palo Alto, our specialist staff of engineers, scientists and designers has built a world-leading reputation for technical excellence, astute project management and, above all, thinking differently. The team has delivered hundreds of new product development projects and well over 300 patents, winning many international design and innovation awards.

www.cambridge-design.co.uk
info@cambridge-design.co.uk

Marks & Clerk

Marks & Clerk

The Marks & Clerk group is recognised as a world leader in intellectual property. Our patent attorneys, trade mark attorneys, solicitors and consultants offer a comprehensive range of services – covering patents, trade marks, designs, domain names and copyright. This includes protection worldwide, portfolio management, IP strategy, commercialisation, licensing, enforcement, due diligence, litigation, valuation and product design consultancy. The extent of our resources means we are able to offer expertise covering an exceptionally diverse range of technologies and commercial sectors.

Our international network of 17 offices – in the UK, France, Luxembourg, Canada, China, Hong Kong, Malaysia, Singapore and Australia – and unrivalled IP connections around the world, enable us to provide single point access to a consistently high quality and cost-effective service both locally and globally.

www.marks-clerk.com
patentbox@marks-clerk.com

Interviews with businesses (8 SMEs, 5 large firms and MNEs) were conducted by Bassel Namih and Edward Cronan, University of Cambridge Judge Business School, on behalf of Cambridge Design Partnership and Marks & Clerk in June 2013. We would like to thank Bassel and Edward for undertaking the research and writing the initial version of the report.