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Will the Patent Box boost the UK innovation ecosystem?

Policy Briefing

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The Big Innovation Centre is an initiative of The Work Foundation and Lancaster University. Launched in September 2011, it brings together a range of companies, trusts, universities and public bodies to research and propose practical reforms with the ambition of making the UK a global open innovation hub as part of the urgent task of rebalancing and growing the UK economy, and with the vision of building a world-class innovation and investment ecosystem by 2025. For further details, please visit www.biginnovationcentre.com.

Headlines

The government plans to introduce a new form of tax relief on incomes from patents through a scheme known as the 'Patent Box' in 2013. It is hoped that this will encourage the development and retention of patents in the UK, thereby boosting investment in innovation and therefore growth.

It is almost impossible to understate the importance of innovation to our economy. We are currently facing a growth crisis, and the only viable route to recovery will come from a rebalancing of our economy towards productive entrepreneurship and the creation of new and innovative product and service offerings. If this initiative can support and stimulate innovation then it could have important implications for the long-term trajectory of UK growth.

This note looks at the recently confirmed details of the measure and considers where and how it is likely to impact our innovation ecosystem. Overall we are optimistic about the promise of additional public resources in this area, but have concerns that a Patent Box might not offer as high returns as more targeted investments.

It is hoped that the Patent Box will encourage more UK firms to invest in innovation, will encourage international companies to locate their innovation activities in the UK and to domicile valuable patents in the UK for tax purposes. Unfortunately, there is limited evidence that these effects will work in practice. There is a real risk that the Patent Box could have a negative net impact on tax income from patents. Perhaps of greater significance however, the Patent Box may create distortions in our economy which skew investment away from the most productive areas of our economy, excessively towards patent intensive industries, formal IP arrangements, large firms and away from service-based business models in technology industries. This should be cause for concern since these are areas where we need to be looking to improve the offer of our intellectual property regime, a major topic of research for the Big Innovation Centre in 2013.

Our concern is that other measures could yield greater returns. In implementing the Patent Box the government should:

1. Consider changing the scheme so that it does not cover existing patents
2. Develop new metrics to monitor the patent box effects
3. Ensure that commitment to this type of broad policy is matched with targeted investments to deliver a strong and well functioning innovation ecosystem

A smart way to boost investment in UK innovation?

The Patent Box aims to boost investment in UK innovation by offering a corporation tax cut on profits associated with patents that are held and developed within the UK. Currently, UK patents protect new, practical inventions by giving the owners rights to prevent others from making, using, importing or selling the invention without permission. The principle is that patents support investment in innovation by allowing financial returns to be better captured. They enable competition, they promote the sharing of knowledge through the disclosure needed to file a patent, and promote the financial sustainability of individuals and firms. The Patent Box, in effect, strengthens the benefits associated with patent ownership.

This reform has been presented predominantly as a tax measure, so this briefing focuses on that aspect. Any patent regulations are also instruments of intellectual property (IP) regulation. We therefore conclude by also considering the place of this initiative within the government's broader IP reform agenda.

As a tax measure, the closest policy instrument for comparison is the Research and Development (R&D) Tax Credit introduced in 2000. Both are horizontal, accounting based industrial policies aimed at building a more supportive environment for innovation.

The R&D Tax Credit seeks to address the market failures which cause many firms to underinvest in the development of new products and services. This is because firms cannot capture all of the benefits from investment in new knowledge, as some will spill over and benefit other players. This means that an optimal investment for a firm can often be well below the notion of a social optimum for the economy.¹ Originally credits were only available to SMEs, but subsequently a separate scheme covering large companies has been introduced. The current rates of relief are 225% for SMEs and 130% for larger companies.

However, by focusing on only R&D the credit has only supported a narrow subset of the ways in which companies pursue and invest in new ideas. For example when Apple expanded from computing into music devices, its investments in marketing and research on alternative business models were as central to the success of the iPod as the development of the device itself. One proxy for this broader investment in innovation is spending on intangible assets (R&D, software, design, brand equity and human or organisational capital). Highlighting just how narrow a portion of innovation investments R&D make up, recently NESTA calculated that R&D represented only 13% of investment in intangible assets in 2009.² In effect, the Patent Box concept looks to broaden out this subsidy. Rather than targeting the research activity itself, the Patent Box offers a tax break to firms which derive incomes from patents, a proxy for new ideas and to some degree innovation.

1 Supporting growth in innovation: enhancing the R&D tax credit, HMT (2005)
http://www.hmrc.gov.uk/consult_new/rd-taxcredit.pdf

2 UK Innovation Index, NESTA (2012)
<http://www.nesta.org.uk/library/documents/WPIInnovationIndex.pdf>

A reduction in the tax liability on income derived from innovative products has the potential to complement the R&D credit, as well as encourage investment in a broader range of innovative activities. A further potential advantage of the Patent Box over R&D tax credits is that tax relief will be unlimited. The R&D tax credit scheme is ultimately limited to a proportion of the total spent on research and development, whereas the Patent Box is only limited by profits. From the perspective of a potential research commissioner, the unlimited benefits from the relief on profits associated with a patent may be much more enticing, especially when considering one-off, high-risk, but also potentially high-return investments.

The box below sets out the key features of the scheme:

What is the Patent Box?

The Patent Box offers a 10% rate of corporation tax on profits associated with patents that are held and developed in the UK. This is less than half the main rate of corporation tax rate of 24%.

Key features:

- All profits arising from the commercialisation of products and processes covered by patents are eligible subject to the deduction of a proportion attributable to marketing assets and a percentage amount set by the Treasury to approximate 'routine' profits. The level of relief is not weighted by the significance of the patent to the product or process;
- Service profits arising from patents are eligible only up to the level of an arm's length royalty – complementary services are not covered. This means that firms with business models that rely on the sale of patented products at low prices in order to sell high-margin related services, as is the case for example in areas of the mobile phone market, may not feel a big benefit from the measure. It is the treasury view that such services derive much of their value from skills and other factors separate from patents, meaning that this would not be an effective proxy.;
- Ownership alone is not enough to qualify – the holder of the patent must either have developed it or met 'active ownership' requirements. Loosely, subsequent expenses on the patent must exceed a certain proportion of its value on acquisition in order to qualify.
- Patents must have been approved either by the UK Intellectual Property Office or the European Patent Office, although the Treasury plans to extend this to cover other national bodies in Europe that use similar patentability criteria;
- Claims for the relief can only be filed once the patent has been granted, but refunds can be back-dated to the time of the application, going back up to four years. Eligibility for relief expires with the patent.
- As well as patents the reduced tax rate applies to plant variety rights and regulatory data protection but not to copyrights or design rights.

Following consultation, the Treasury plans to phase-in the measure over the period to 2017. It is estimated that the cost to the Exchequer will be £350m in 2013-14, rising to £910m by 2016-17.

The three mechanisms through which it is hoped the Patent Box will operate are set out below. The paper goes on to consider the potential of each of these in detail:

1. Will the Patent Box encourage firms to take forward investment decisions at the margin?

Encouraging firms to invest more in innovative new products and processes

When firms invest in potentially innovative new products and processes, they take a risk whereby the resulting revenue may not cover the cost of their investment. By increasing the post-tax revenue associated with the commercialisation of patents the policy increases the probability that any given investment programme will be profitable. To the extent that firms take probable taxes on profits into account when making investment decisions the Patent Box should increase their number.

By allowing firms to retain a larger proportion of their income, the scheme has the potential to boost effective consumer demand at a time when this is severely depressed.

Unfortunately, evidence on the likely impact of a patent-specific tax-based measure is scarce. Similar schemes elsewhere are a relatively recent development and many include intellectual property protection as well as patent subsidies, which makes comparison difficult³. For this reason we draw on evidence of the effects of R&D tax policies as that most useful in assessing the likely efficacy of these two mechanisms.

Worryingly, this evidence raises a number of questions about the effectiveness of R&D tax credits which the Patent Box may also fall foul of:

- There are signs that managers do not take into account tax breaks when making decisions about whether to invest in R&D activities. Research commissioned by the Treasury and BIS into the impact of R&D measures found that tax credits are taken into account indirectly, if at all, by those who decide whether to perform R&D⁴. Partly this is due to a disconnect between the financial and research sides of the businesses surveyed; the complex nature of the credits mean that if research decisions are made incrementally the process of factoring them in would be very time consuming. However, some managers reported that although the credits were not considered on a case-by-case basis, they resulted in a general view of R&D as being less costly and thus made commissioning more likely. It is far from clear that the Patent Box will overcome these issues with tax based incentives.
- Tax credits seem to be less effective as an incentive for small firms. The Treasury's introduction of an above-the-line credit can be seen as a response to this; in its

³ The Information Technology and Innovation Foundation have mapped the rise of these initiatives in Belgium, China, France, Ireland, Luxembourg, the Netherlands, Spain and Switzerland - <http://www.itif.org/files/2011-pb-atkinson.pdf>

⁴ An evaluation of research and development tax credits, HMRC <http://www.hmrc.gov.uk/research/report107.pdf>

proposals for the tax credit it has highlighted three key advantages of this approach. Firstly, such a credit is more visible to those making investment decisions, as opposed to the more complex deduction system which is more likely to be understood by the tax department. Secondly, it would offer greater certainty, as the amount of relief is not contingent on the input of other parts of the business into overall profit. Thirdly, it means that relief can be given to loss-making firms, something which could be helpful in boosting the R&D expenditure of startups or other companies conducting research that is expected to take a long period before translating into a commercial output. The Patent Box is very different to an above the line credit since it applies to profits earned.

- There are some indications that the tax credit scheme may not be driving significantly increased investment in R&D. The latest set of R&D statistics from HMRC suggests that claims for the scheme are increasing without an overall increase in spending on R&D⁵. It is a worry if this type of scheme does not significantly alter behaviour given the parallels with a Patent Box.

There is clearly a number of reasons to remain sceptical about the potential here for this scheme to substantially influence investment in innovation. By targeting the income that results from technologies rather than the underlying research activity, the Patent Box relies on the successful operation of a number of complex consequence chains to boost innovation. There are unfortunately multiple ways in which these can fail to operate as expected. The evidence presented here suggests that innovative processes can not be modelled neatly and it is unrealistic to expect marginal changes in the tax environment to follow thorough to marginal gains in investment.

2. Will the Patent Box encourage international companies to locate their innovation activities in the UK?

Firms with a choice of locations for investment in R&D may be encouraged to pick the UK above the alternatives

Another aim is the retention and attraction of internationally mobile innovative activities. HM Revenue & Customs say the Patent Box “will encourage companies to locate the high-value jobs associated with the development, manufactures and exploitation of patents in the UK and maintain the UK’s position as a world leader in patented technologies.”⁶ The lower rates of corporation tax offered by countries such as the Netherlands may offer multinational corporations an incentive to locate their patent development and exploitation activities abroad. The introduction of similar schemes elsewhere in Europe add to the competition we already face. The Patent Box is partly aimed at meeting this challenge.

5 http://www.hmrc.gov.uk/stats/corporate_tax/rd-introduction.pdf

6 Corporate Tax Reform: Patent Box, HMRC <http://www.hmrc.gov.uk/budget2012/tiin-0726.pdf>

Many of the issues flagged above simply do apply when considering Multi-National Corporations. The key question here is not how to encourage them to invest in innovative activities, but ‘what will ensure that they choose the UK over and above other locations?’.

Cash incentives in the form of a tax break on profits is an appealing device here. That said, the types of companies who could be attracted on such cost grounds may contribute little to the UK innovation ecosystem.

In thinking about the Patent Box’s draw it is helpful to think of two highly stylised types of activity. Many, production oriented activities have become routine, and can be delivered from a set of codified instructions or a blueprint almost anywhere in the world (clothing manufacture is often a good example here). This type of work is not connected to the territory in which it happens. It does not depend on highly specific local expertise, specialist local supplier networks or proximity to institutions such as a research university – they are de-territorialised. In contrast, cutting edge and innovative activities are often inherently place based – they depend on a local network of individuals and related organisations or institutions to help discuss and develop ideas. Activities such as single-seat racing car production or high-tech start-ups thrive in clusters of activity which is deeply rooted into a network (territorialised).

It is easy to see how a cost incentive could impact on the location of the first group of de-territorialised operations, and almost impossible to anticipate a significant impact on the rest – networks are sticky, they anchor economic advantages in specific locations and are unlikely to move in response to modest tax breaks. The trouble is that the types of innovative activities this policy is trying to attract are very often inherently territorialised – cutting edge activities which can only function effectively within a particular spatial network.

Patent development within de-territorialised activities is by no means impossible; it is just difficult to understand why we would look to attract it. We are by definition talking about organisations operating in isolation rather than connected to and contributing to our innovation ecosystem. There is even a risk here that these isolated attracted activities could create a distortion. It would be real issue if they started to compete for talent with domestic operations who are delivering greater social returns through their connection to UK networks and their contribution to the UK innovation eco-system. Put simply, there is a real risk here that the patent box will only target the types of innovative activities which we should be least interested in attracting.

3. Will the Patent Box encourage firms to domicile valuable patents in the UK?

Encouraging firms to domicile valuable patents in the UK

In some cases profits will be eligible for relief even where the research

supporting the filing of the patent was not performed within the UK, as long as certain 'active ownership' conditions are met. The conditions are intended to make eligible profits that have arisen from patents being managed in the UK, either by developing the IP itself or the way in which it is exploited. This could also prevent firms from relocating such activities abroad for tax reasons, therefor boosting HMRC receipts.

At a time when other countries are cutting corporate tax rates⁷ and many are introducing Patent Box schemes, it is understandable to fear a loss of tax revenues in this area. Viewed from this perspective, this policy is, however, associated with a very large deadweight cost. It is impossible to target just the patents which might move off shore; so instead the scheme will offer a very costly subsidy to all patent holders. This makes the merits of the Patent Box from this perspective a very technical cost benefit calculation. Will the revenues retained by the tax break exceed the costs?

Analysis from the Institute for Fiscal Studies has explored exactly this question by building an international model of patent ownership. They reach an unambiguous conclusion that when costs of the scheme will outweigh the benefits, the lost income from applying a lower tax rate to all patents will outweigh the extra tax income, which would be associated with the UK holding an increased share of global patents.⁸

The evidence presented here shows that as a tax measure, the Patent Box is likely to have a modest impact on the decision making processes of UK-based firms. It is unlikely to help us to attract the types of activities which truly transform our innovation ecosystem. Finally, the deadweight costs of the scheme look set to outweigh the potential gain from attracting the registration of foreign patents in the UK.

There is a theme here which connects to a wider policy agenda. The Work Foundation and the Big Innovation Centre have consistently argued that the UK can not hope to maintain our living standards by competing in the world as a low-cost destination. Instead we need to find ways to ensure we invest in and develop our knowledge economy, and maintain our innovation ecosystem as key drivers of value creation which will attract foreign investment⁹. Viewed from this perspective, the Patent Box does run contrary to this logic.

Is the Patent Box still a limited approach?

7 See for example recent analysis by the CBI

http://www.cbi.org.uk/media/1321925/cbi_budget_submission.pdf

8 Griffith, Miller and O'Connell (2010) Corporate Taxes and Intellectual Property: Simulating the Effect of Patent Boxes

9 For extended discussion of this point see

http://www.theworkfoundation.com/assets/docs/publications/290_plan%20for%20growth%20in%20the%20knowledge%20economy.pdf or <http://biginnovationcentre.com/Reports/6/Making-the-UK-a-Global-Innovation-Hub-How-business-finance-and-an-enterprising-state-can-transform-the-UK>

As a tax measure the appeal of the Patent Box is clearly limited. However, the idea also needs to be considered as an instrument of IP policy. The Patent Box has been thought of as a classic neutral, horizontal industrial policy tool. It can be applied to all companies, in all sectors and should be blind between alternative competing technologies – any organisation with a novel product can apply for a patent. However, the Patent Box will be far from neutral. It is an IP tool which will favour investment in innovation where this is likely to yield a patent outcome over alternative forms of protection.

This is likely to create distortions and bias investment and our innovation system in a number of ways:

1. Patent intensive industries – The scheme could encourage investment disproportionately towards industries in which patents are most relevant such as pharmaceuticals, electronics and defence. Innovation within the creative industries, by contrast, very rarely produces patentable outputs but could suffer adversely if the policy skewed the competition for resources in favour of firms in other sectors, even those which focus on other formal IP protection through copyrights or design rights;
2. Towards formal IP arrangements – the formal use of IPRs is only one option for organisations looking to commercialise their knowledge. Softer forms of protection which promote knowledge sharing as part of a business model (such as open source or creative commons etc.) seen as increasingly important in a modern economy. The recent OECD report *Intellectual Assets and Innovation: The SME Dimension* (for which the Big Innovation Centre’s Director, Birgitte Andersen, delivered the UK case study) demonstrated that policy should not focus on or prioritise hard rights over softer arrangements. There is a significant risk that the Patent Box does just that;
3. Large vs. small firms – the OECD report cited above also confirmed that patents are a tool which are more effective for large, rather than small organisations. The Community Innovation Survey shows us that firms of more than 250 employees are twice as likely to apply for a patent.¹⁰ Both large and small companies play a vital role in our innovation ecosystem so it is highly risky to introduce a measure which benefits one group over another;
4. Service-based business models – as noted above, the Patent Box will not cover incomes from services associated with patents. This is much more than a technical issue, since delivering service income from advanced products seems to be an area where the UK excels. In 2011, our colleague Andrew Sissons published a report demonstrating the

10 See BIS (2012) UK Innovation Survey 2011 – First Findings. Accessible from <http://www.bis.gov.uk/assets/biscore/science/docs/f/12-p107-first-findings-uk-innovation-survey-2011.pdf>

significance of this model for our manufacturing sector – it is widely known that Rolls Royce now generate more income from services than the sales of their engines, but this is a business model repeated across the UK manufacturing¹¹. The evidence presented within this report identifies this business model as central to the future of our manufacturing sector. Given the focus of the Patent Box on manufacturing, it is an issue that it does not connect well with this business model.

The challenge here is that the Patent Box is not necessarily pulling our IP regime in a sensible direction. The Big Innovation Centre has long argued that innovation is a highly a collaborative activity, highly dependent on informal arrangements, information flow across networks and between large and small firms and appears to increasingly drive value from the rise of new types of business model¹². There are huge economic dividends for any country building frameworks which reward innovators but also enable modern modes of collaboration. Any significant IP reform must embrace this agenda. The bias built into the Patent Box approach presented above suggests that this may actually be pulling us in the opposite direction. This is perhaps in sharp contrast to the proposed changes to copyright laws published by BIS in December 2012.¹³ While predominantly focused on non-commercial organisations they do show an awareness of these needs.

A Patent Box for the UK innovation ecosystem

The Patent Box is a very powerful idea. The fact that the UK government are choosing to spend close to £1bn on this type of measure at the same time as cutting the budget deficit marks it out as an important statement. It demonstrates a commitment to support UK innovation and our knowledge economy.

Unfortunately there is little by way of compelling evidence that this scheme can drive a step change in UK innovative activities, or generate substantially expanded tax revenues. This is a worry since the scheme is not without risks – it could potentially distort how we invest in innovation.

Perhaps the greater issue is that the Patent Box doesn't appear to target a key weakness in our innovation ecosystem. Our research hasn't identified a plausible mechanism through which the scheme can unlock significant potential. The initiative can be best thought of as a broadening of the R&D tax credits, however it is not clear that it responds to the challenges levelled at that scheme. To invest on this scale in this type of broad horizontal industrial policy we would expect these issues to be overcome. This potential for this policy to operate as a tax incentive to support domestic innovation seems modest. It is unlikely to represent a major draw for truly innovative activities and is unlikely to boost tax receipts through the

11

http://www.theworkfoundation.com/assets/docs/publications/284_more%20than%20making%20things.pdf

¹² For further discussion of this topic please see Andersen et al (2011) 'Making the UK a global innovation hub' and Levy and Reid (2011) 'Missing an Open Goal'

¹³ <https://www.gov.uk/government/news/consumers-given-more-copyright-freedom>

registration of foreign patents. It also does not appear to develop the UK's IP regime.

The concern is that other measures could yield greater returns. For example, focusing on the factors which hold back the growth of potential high growth firms, such as weak management and leadership skills could equally impact on innovation since these organisations are the carriers of innovative new products and services. Alternatively, targeted infrastructure investment can help to unlock the potential of new areas of economic activity.

In implementing the Patent Box, the government should:

1. Consider changing the scheme so that it will not cover existing patents. While this could introduce a new distortion this would significantly reduce costs without necessarily impacting significantly on the incentive effects of the Patent Box scheme;
2. Develop new metrics to monitor the Patent Box effects - Careful monitoring of the spend and finding ways to compare the effects of this scheme to more targeted measures will be key for future development;
3. Ensure that commitment to this type of broad policy is matched with targeted investments to deliver a strong and well functioning innovation ecosystem. We need to secure UK innovation, not just because it is cheap or tax efficient, but because it is the only place in the world to achieve a particular goal – in the long term this will be the key reason for corporations to invest in the UK.

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