

Written evidence submitted by inventory Limited

Executive Summary

- The Science and Technology Committee is examining intellectual property in the context of technology transfer challenges.
- While intellectual property makes up a massive value of a company, there are few valuation techniques available to practitioners.
- The UK has implemented remedial technology transfer steps with greater market powers, which have led to some marginal improvements to technology transfer.
- Creating an intellectual property exchange would be a major step in closing gaps in innovation in the UK.

inventory Limited, operator of inventory.com, is an online, global patent exchange that fully automates the entire technology transfer process. It employs Artificial Intelligence to support market-making and to create liquidity in IP trading.

The Science and Technology Committee is holding evidence sessions into ‘managing intellectual property and technology transfer’ just as new pressures on public funding into fundamental research may arise from the unknown nature of the 2016 United Kingdom's vote to withdraw from the European Union. Based on several metrics, the UK is performing at the highest global level in the areas of basic research across most fields of sciences.ⁱ But there was significant evidence to indicate that public investment into research was not being adequately monetized. This is even more pronounced with university technology transfer.ⁱⁱ Both anecdotal and literature evidence suggest that current methods for transfer in the UK result in “low levels of absolute efficiency activity and that there appeared to be decreasing returns to scale.”ⁱⁱⁱ

Price discovery is one of the major challenges in technology transfer. Companies typically cannot assess the value of the innovation ex ante, while Technology Transfer Offices (TTOs) have little information to measure future cash flows a new innovation might generate. This creates negotiation stress, which can be exacerbated by human engagement in the licensing effort. Unfortunately, there is no public market and little private market information from which historical trading information could assist in intellectual property valuation.

The patent, while not the only asset of transfer of intellectual property, is still the most common way to define what is being transferred. As an instrument it is protected, can be re-assigned and is capable of producing revenue. The *Growers Review of Intellectual Property* commissioned by the Chancellor of the Exchequer in 2006 had established that intangible assets make up 70% of a company's value and by 2011, £65 Billion was being spent by UK companies on intellectual property rights.^{iv} But without adequate valuation, transfer (and other finance activities such as insuring and using as credit) is hindered. For this reason, the UK Intellectual Property Office is actively seeking solutions to these issues.

Historically, the UK has had some major successes with technology transfer. It has also had to look into why some UK based inventions like graphene, where only 1% of graphene related patents were first filed in the UK^v, seem to be slower to transfer than in other geographies. Recently, the UK implemented some of the most innovative differentiation models in place for TTOs.^{vi} The simplified license was introduced by some TTOs but has had slow uptake and become the home to patents TTOs have had little interest in marketing. Often operated by non-

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profits or software companies, free market mechanisms have failed to take significant hold with this method.

Frustration with process in many areas led to researchers bypassing TTOs in many universities.^{vii} To counter this, “royalty distribution formulas” were established to motivate researcher-driven business development by sharing royalties directly with the researcher. Since 2005, the University of Cambridge has offered a novel approach where (subject to funding terms) the researcher may option to commercialize their IP independently. This both encourages the researcher and creates competitive tension with the TTO. These remedial steps, such as short form license agreements and researcher control of rights, are all marginal steps to let the free market push liquidity.

Another common complaint about why public research fails to commercialise, even when patented, is the Technology Readiness Level (TRL) of an invention. This systemic approach to evaluate commercial readiness was adopted by many governmental agencies and is used by companies to determine how much more resource could be needed to prepare an invention for market. But as companies retreat further away from early research^{viii}, low TRLs are avoided due to perceived risk. But one only needs to look at the rapid change of the TRL for CRISPR/Cas9^{ix} technology once macro conditions were right and complimentary techniques became available. CRISPR/Cas9 went from untouchable TRL level to what could be the biggest patent battle for university technology.^x

There are clearly market failures, market inefficiencies and a lack of price transparency in technology transfer. One would assume under these conditions, there would be a trading market/exchange for intellectual property. While many ‘platforms’ have claimed to allow for fluid transfer of intellectual property rights, there is no current intellectual property exchange that automates the entire end-to-end technology transfer process. Most ‘platforms’ at best offer a landing page to begin brokerage led sales activity. But this is not what was intended by the internet and insures that liquidity would never occur on an IP ‘platform’.

Creating an intellectual property exchange would be a major step in closing gaps in innovation in the UK. Remedial steps taken by TTOs, as discussed earlier, have improved liquidity because they enable market forces to better evaluate illiquid assets such as intellectual property. There is a trend due to the nature of the internet to unleash illiquid assets, from art to whisky. It is surprising that a major balance sheet component-asset such as intellectual property would not be considered an alternative asset ready for market trading. Such consideration would likely lower technology transfer transaction costs and provide needed price discovery.^{xi} The UK, with its massive research capacity, financial sector and the Patent Box, would be an ideal location for such an exchange.

Recommendations

- Support private efforts to create an intellectual property exchange in the United Kingdom.
- Identify regulation which would allow intellectual property to be treated as an alternative asset that could also be bundled and indexed.
- Encourage direct sales of intellectual property over the exchange by public entities to increase return on public investment in technology.

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ⁱ UK Department of Business, Innovation and Skills. *International comparative performance of the UK research base –*

ⁱⁱ Loftus, S., and C. Sillars. "Understanding technology transfer." (2005).

ⁱⁱⁱ Kim, Younhee. "The ivory tower approach to entrepreneurial linkage: productivity changes in university technology transfer." *The Journal of Technology Transfer* 38.2 (2013): 180-197.

^{iv} Haskel, Jonathan, et al. "Driving economic growth Innovation, knowledge spending and productivity growth in the UK." (2011): 15.

^v UK Intellectual Property Office Informatics Team. "Graphene - The Worldwide Patent Landscape in 2015, Newport: Intellectual Property Office." (2015)

^{vi} Lawton-Smith, Helen, and J. Glasson. "UK university models of technology transfer in a global economy." (2016): 179-201.

^{vii} Huyghe, Annelore, et al. "Are researchers deliberately bypassing the technology transfer office? An analysis of TTO awareness." *Small Business Economics* 47.3 (2016): 589-607.

^{viii} Mims, Christopher. "Is Engine of Innovation in Danger of Stalling?" *The Wall Street Journal*. Dow Jones & Company, 20 Nov. 2016. Web. 12 Dec. 2016.

^{ix} Jinek, Martin, et al. "A programmable dual-RNA-guided DNA endonuclease in adaptive bacterial immunity." *Science* 337.6096 (2012): 816-821.

^x Cookson, Clive. "DNA editing accelerates on controversial healthcare path" *Financial Times*. A Nikkei Company, 29 Nov. 2016. Web 29 Dec. 2016.

^{xi} Ben-David, Itzhak, Francesco Franzoni, and Rabih Moussawi. *Exchange Traded Funds (ETFs)*. No. w22829. National Bureau of Economic Research, 2016.