

Allocating HEIF: the Suitability of Knowledge Exchange Income as a Proxy for Outcome Performance

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This opinion piece outlines key issues and implications in using knowledge exchange (KE) income as the core metric in allocating Higher Education Innovation Funding (HEIF). Concerns have been raised about whether using KE income appropriately incentivises higher education institutions (HEIs) to maximise economic and societal impacts through their KE activities – the government’s key objective for HEIF – or whether it leads to perverse behaviours, such as income maximisation to the detriment of impact. A related concern is whether using KE income results in fair allocations to HEIs given their different strengths and diverse portfolios of KE.

The importance of government funding for knowledge exchange

Knowledge produced within universities is most often a public good: it is thought to be non-excludable (there is no way to exclude anyone from its use, for example, related to payment) and non-rivalrous (consumption by one party does not diminish consumption by others). It generates significant spillovers (benefits spreading beyond immediate or obvious consumers) that can be hard to appropriate (deploy to a particular purpose). This leads to significant differences between private and social returns on investments in knowledge production – the benefits to the public outstrip those to any particular user, and there are significant challenges in how those benefits are reaped.

By the very nature of ideas generated within higher education (HE), knowledge often suffers from high degrees of technical, financial and market risk. In addition, we know that productive linkages between HEIs and firms are becoming increasingly important in the effective diffusion and exploitation of knowledge in the economy. However, increasingly well recognised ‘innovation system failures’ hamper the establishment of these direct linkages. These system failures flow from differences of objectives, incentives, norms and values between universities and enterprises that make sympathetic connection more challenging. In addition, both HEIs **and** firms require sufficient internal capabilities and processes, to transact and collaborate efficiently and effectivelyⁱ. These have historically been significantly underdeveloped, although significant advances within HEIs have been made in recent years.

It must also be recognised that academics produce different types of knowledge which will inevitably sit at different points along the public-private good spectrum, and different segments of target ‘markets’ for the knowledge will face differing degrees of market and system failures. As such, the appropriate balance of public and private investment will depend critically on the type of knowledge being exchanged and the target markets for this knowledge.

Measuring KE outcomes

Measuring the impacts arising through KE is also incredibly challenging. Pathways to impact are long and varied and depend on significant complementary investments by othersⁱⁱ. Given these

challenges, there is a dearth of easily measurable, auditable, and comparable impact metrics. There is thus a trend towards measures of ‘implied demand’ rather than ‘actual outcomes’ⁱⁱⁱ.

What does KE income tell us about KE outcome performance?

The HEIF funding allocation process aims to incentivise HEIs to focus on delivering economic and societal outcomes. To do so, it aims to reward HEIs for higher KE outcome performance through relatively higher allocations. To achieve this, it uses KE income as a **proxy** for KE outcomes.

What, then, does KE income tell us about performance? **KE income provides an important indication that valued linkages are forming between the university base and the wider economy to diffuse and exchange knowledge.** If reasonably well governed and accountable organisations are willing to pay for KE, they must believe some value is being derived. **At minimum therefore, KE income represents an implied demand for the capabilities and expertise available within HEIs.**

Standard economic theories of the firm would also suggest that the price paid for a good or service reflects the marginal (the additional benefit the consumer receives from an one additional unit) contribution of that good or service to their organisation. However, KE is believed to lead to complex spillovers, multiplier effects, supply chain effects, and unexpected benefits emerging through both the deployment of the acquired knowledge and through the KE process itself (for example, learning by doing and interacting). This suggests that the price paid does not fully capture the additional socio-economic benefits of the consumption of KE. **One could argue, therefore, that KE income represents a minimum bound on the monetary value of the KE.**

The amount of KE income generated (attributable to HEIF) also provides an indicator of the degree of leverage it generates for knowledge diffusion and exploitation. A distinctive benefit of the transition towards formula funding is the flexibility it gives to HEIs proactively to target and respond to emerging opportunities, and leverage other sources of KE funding. Crucially, it is also used to demonstrate the potential, and reduce the risk, of KE activity to attract subsequent investment.

KE income can also be aggregated across different KE mechanisms and compared across institutions. This is not true of non-monetary-based KE measures.

What does KE income not tell us about KE outcome performance?

Despite the above, KE income is neither a perfect, nor comprehensive indicator. Some KE engagements do not generate income, while some will generate benefits that are clearly not captured by the income generated^{iv}. Currently there is little evidence on the scale of the latter.

Recent evidence showed that there is significant variation in the extent to which KE services involve monetary transactions and the degree to which these cover the full costs of engagement^v. This relates in part to the public-good nature of the KE services and the need for the public sector to co-invest alongside the private sector to address the key market and system failures outlined earlier.

Does the use of KE income lead to a biased distribution of HEIF?

Is there a bias affecting certain types of HEIs in the HEIF allocation process purely because of the nature of the metric used? Comparing the likely income from non-transactional KE engagements^{vi} and the known KE income generated by different types of HEIs shows that there is little difference in distribution between the two. This suggests that using KE income in the formula does not significantly bias against certain types of HEIs.

Does using KE income in the allocation of HEIF lead to perverse behaviours?

Does using KE income in allocating HEIF lead to perverse behaviours, with HEIs seeking to maximise income rather than impact, leading to detrimental effects on the government's objectives for KE?

I argue that there is not a dichotomous decision between generating income and generating impact. Indeed, generating impact should, in many circumstances also generate income. However, decisions should prioritise impact and then establish an appropriate level cost given the nature of the knowledge and technology in question – that is, users should be expected to pay something. The 'appropriate' level will depend on where the knowledge or technology sits on the public to private good spectrum or the degree of other market failures present^{vii}.

In addition, KE transactions involve negotiations between HEIs and firms, not least around terms and conditions (including terms of use of intellectual property (IP)) and costs. Firms, operating in the interests of shareholders, will be seeking the best possible terms, and therefore have interests in arguing that universities are operating unfavourably. HEIs should be approaching negotiations with the interests of taxpayers of UK plc in mind, ensuring long-term economic and social returns with firms compensating appropriately for the (potentially significant) costs incurred by the public sector. University approaches to negotiations (including on costs) are likely influenced by a number of key factors including: (a) overall policies and guidance from university leadership on objectives for KE and approaches to costing (for example, relative prioritisation of maximising impact, income, volume etc.); (b) the competencies of the individuals involved and their ability to determine and communicate to the firm the public good content or degree of market failure and hence justify the fees; and (c) the availability of accepted practices and processes within the university to support these choices. It is possible that some HEIs, given financial pressures, limited capabilities of staff, or inappropriate guidance, are either deliberately or inadvertently focusing more heavily on maximising income.

Does the HEIF formula lead HEIs to overcharge firms systematically for a particular KE service? There is currently very little evidence on this point. Given that income generation is not inconsistent with impact maximisation, it is hard to establish whether increases in KE income are a result of a deliberate policy of income maximisation or a strengthened focus on diffusing valuable knowledge for which there is a price. The period of analysis is also complicated by the effects of the economic recession, which were most pronounced on those HEIs with perhaps a greater incentive to pursue income. Other evidence finds that most HEIs generally do not seek to maximise income or make profits from their KE, and indeed do not cover the full costs of their KE activities^{viii}. Surveys of businesses provide mixed evidence on whether costs and expectations about what KE can deliver are important barriers to engagement^{ix}. Lastly, if HEIs were seeking to maximise income over impact, one might expect to see a switching in academic engagement towards more income-generating activity following the introduction of formula-driven funding. This appears not to be the case^x.

In conclusion

Allocating HEIF funding through formula driven by KE income goes some way to incentivising HEIs to focus on strengthening socio-economic impacts through KE. While not a direct measure of socio-economic impacts, it does provide an auditable, easily measurable and comparable metric that provides an indicator of implied demand for knowledge exchange and the power to leverage additional funds to support the process. There is currently a lack of alternative metrics without the

introduction of a major new data collection exercise. However, given the potential for HEIs to pursue income over impact in order to generate additional funding, additional safeguards could be considered and introduced operating alongside the formula to help to mitigate against this risk.

ⁱ Hughes and Martin (2012).

ⁱⁱ Hughes and Martin (2012).

ⁱⁱⁱ Coates Ulrichsen (2015).

^{iv} Coates Ulrichsen (2015).

^v This ranges from 'public space' activities such as events and networks aimed at stimulating interactions that will hopefully lead to further engagements where just 10% involve a transaction and where these transactions cover just 20-50% of costs; to enterprise support (e.g. for small and medium-sized enterprises) where around 50% involve a transaction covering between 25-75% of costs; to innovation and research-related KE where 87% involve a transaction covering between 50-100% of costs (PACEC, 2015).

^{vi} The likely income from these non-transactional KE activities was estimated in Coates Ulrichsen (2015).

^{vii} For example, knowledge developed through public funding to a point relatively closer to market with fewer technical risks associated with its deployment would attract a higher charge from firms looking to acquire it. Similarly, providing (part-) publicly funded support for innovative activity in small and medium-sized enterprises is relatively well accepted as a role for government.

^{viii} PACEC (2015).

^{ix} A survey of businesses in 2008 (Hughes and Kitson, 2014) found that the cost of interacting was not frequently cited as a reason for not engaging. By contrast, awareness issues, and understandings of potential benefits and the processes, were much more important. Interestingly, large companies were much less likely than small companies to cite cost issues as a barrier to engaging. However, a survey by Bruneel et al. (2010) of engineering and physical science collaborative research in the UK found half of the firms involved believe HEIs have unrealistic expectations and oversell their research.

^x Another point of evidence comes from the longitudinal comparisons of academic KE activities based on surveys of academics in 2008 and 2015 (Hughes et al., 2016). If the formula was incentivising income maximisation within universities, one might expect to see a shift towards income generating KE activities on the ground. This does not appear to be the case. Note also that the picture is complicated by the effects of the recession and REF, as acknowledged in the study.

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