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Title: Performance analysis of spin off companies from a UK 'redbrick' university: A case study of the University of Birmingham

Summary

University spin off companies (USOs) have become a significant feature of the UK's further education landscape over the last twenty years. UK universities have been encouraged by successive governments to expand their 'third mission' of entrepreneurship alongside the traditional activities of teaching and research, and USOs are one of the embodiments of that strategy.

Legislation enacted in 1985 allowed UK universities for the first time to retain the intellectual property rights (IPR) arising from research that was publicly funded. The UK's actions followed the Bayh-Dole Act of 1980 in the US which intended to facilitate spill over of knowledge created at universities for the public benefit (Mowery et al, 2004). The wider USO phenomenon in the UK owes much to desire to match the apparent success of the earlier policies in the US (Guena & Rossi, 2011).

While the changes in legislation need not necessarily have led to the widespread proliferation of USOs as the vehicle of choice for UK universities through which to exploit their new IPR, this has been the result. Alternative methods of exploitation such as licences have not achieved the same prominence. Again, this may be a reflection of the desire to create USOs in the mould of the small number of highly successful US equivalents. Companies such as Genentech have raised millions of dollars for the parent university through attracting third party finance, culminating in stock market flotation (Wennberg et al, 2011).

Given the large number of UK USOs created over recent years, studies of their financial performance would thus appear, on first principles, to be vital to carry out to assess whether the USO is the optimum method of IPR exploitation. As large sums of public money have been invested in these programmes of USO creation (Wright et al, 2008), it would again be expected that government, and possibly even taxpayers, would require such studies to be widespread to ensure good governance and optimisation of their investment.

There has also been an increasing trend in scepticism among commentators over the performance of USOs. The lack of a UK USO to reach the size of their largest US counterparts, and indeed the more general apparently inferior performance of UK universities in generating revenues, employment and value from their USO programmes, when compared with the US, has also been noted. The financial performance of USOs has also been unfavourably compared to that of corporate spin offs (CSOs) in a number of studies (Zahra et al, 2007). Criticisms have also focussed on the apparent measurement by the UK government of the success of the UK's USO programme by considering the number of USOs generated rather than the quality and ignoring performance measures such as the amount of third party finance attracted (Guthrie, 2004). A picture is painted of a large number of very small

USOs in the UK which are not justifying the investments and hype surrounding them. Harrison & Leitch (2010) describe USOs as a 'voodoo institution' where hard evidence for backing up claims of success is lacking.

There have been relatively few studies of the financial performance of USOs to date in the UK and elsewhere (Wennberg et al, 2011). At first glance this may be surprising as there are a large number of USOs which have been created over a significant length of time. However, attempts to conduct studies meet a number of problems. These have led to the repeated observation that there is a lack of data of a sufficiently high standard (Rothermael et al, 2007).

Firstly, there is no consistent definition in the academic literature of a USO (Zahra et al, 2007). For example, the Higher Education Funding Council for England's (HEFCE) annual report identifies four categories of USO, namely:

- i) Spin offs with some HEI ownership
- ii) Formal spin offs, not HEI-owned
- iii) Staff start ups
- iv) Graduate start ups

Clearly these are four very different types of entity and constructing a data set for any one category would require very different methods from the others. Any attempt to compare financial performance across the categories, or even to be sure that all relevant companies have been captured, is therefore fraught with difficulty.

Secondly, it is difficult to verify the total population of USOs associated with a university. While universities and their associated technology transfer offices (TTOs) maintain data, it may be incomplete, especially in regard of older USOs or USOs that have failed. There may be vested interests to take less care in recording this latter category. While databases do exist e.g. Spinouts UK, the data contained therein is only as good as its source and needs to be verified thoroughly.

Those performance studies that have been carried out to date have also been prone to use measures that are not the most useful in assessing the performance of USOs. While measures such as sales and employee growth are relatively easy to establish, they may not be the most appropriate for young companies such as USOs as they can very easily give distorted results. Measures which seek to determine the value of USOs, for example the amounts of finance raised from third parties, are much more useful but data is very hard to come by. This is due to the fact that such deals are often kept confidential in terms of numbers and that older deals may be difficult to find data on.

A further limitation on obtaining financial data for the UK USOs is the reduction in data availability for such companies on public record over recent years. For some years in the UK, small companies have been able to file abbreviated accounts at Companies' House which do not require disclosure of a wide range of information, including both turnover and employee numbers. Given that this is the only publicly available source of company financial data, it is now almost impossible to collect such data from a third party source independent of the company itself which reduces the objectivity of any analysis. Given their size, almost all USOs will file abbreviated accounts to avoid the time and

cost of filing more detailed disclosures. Such issues have already been noted in performance studies (Lawton Smith & Ho, 2006), and the importance of obtaining data from sources outside a university environment has been noted (Wennberg et al, 2011).

There is therefore a significant gap in the literature on the studies of financial performance of UK USOs. The aim of this study will be to use detailed financial analysis of companies' historic, publicly-available financial data to create an accurate database of USOs and then to construct a 'narrative' of a company's financial history and performance.

The University of Birmingham (UoB) has been chosen as the subject of the study as it represents the UK's 'redbrick' universities i.e. the first universities founded after the mediaeval institutions. It is a member of the Russell Group, a grouping of the top UK research universities. Studies performed in the UK to date have considered Oxford (Lawton Smith & Ho, 2006), Cambridge and London Universities which constitute the elite UK universities with particularly strong and well-funded science departments, from which the majority of USOs originate.

This study will therefore provide a perspective on the next tier of UK universities and determine whether the USO phenomenon has provided significant benefits to the university. It will serve to complement a study of the redbrick Queen's University, Belfast by Harrison & Leitch (2010) and provide further insight as to whether the performance of USOs justifies the resources invested in them.

The key additions to the literature on USOs from this study will be the technique of the construction of a rigorous data set of USOs for a university using a variety of publicly available sources, and to investigate key performance measures such as survival history of the USOs and amounts of money raised from third parties by USOs, measures that are particularly under-represented in the analyses to date.

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