THE INSTITUTIONALZATION OF THIRD STREAM ACTIVITIES IN U.K. HIGHER EDUCATION

Institutional theory, from its inception, has developed to explain how some organizational practices/forms survive, and even proliferate, despite having no economic/technical justification. Organizational practices do so through a process of institutionalization, through which they become legitimate when they are: taken for granted in terms of a cultural-cognitive rationale; government mandates them in terms of a regulator rationale; and professionals deem them to be appropriate in terms of a normative rationale (Scott, 2001). An organizational practice is institutionalized when it is deemed to be an appropriate and necessary component of efficient, rational organizations, and as such, organizations are under considerable pressure to incorporate these elements into their formal structure in order to maintain their legitimacy (Tolbert and Zucker, 1983). In conforming to the new institution "an organization demonstrates that it is acting on collectively valued purposes in a proper and adequate manner" (Meyer and Rowan, 1977, p. 319). In essence, the practice may have little or no effect on the actual efficiency of organizational operations. Accordingly, our focus here is not on efficiency but rather on the adoption of an organizational practice because it fulfils symbolic rather than task-related requirements.

The process of institutionalization, however, does not merely happen. Institutional actors (namely institutional entrepreneurs) may be motivated to promote the institutionalization of an organizational practice, which has led to scholars' increasing interest in institutional entrepreneurship (see: Battilana, Leca and Boxenbaum, 2009, for a review of the literature). The literature on institutional entrepreneurship explores how institutional entrepreneurs seek to influence institutional arrangements in order to enhance their position and hence ability to

promote interests which they value highly (Beckert, 1999; DiMaggio, 1991; Fligstein, 1997; Lawrence, 1999). In particular, scholars have argued that actors are more likely to engage in institutional entrepreneurship when facing lower degrees of institutionalization, and thus higher levels of uncertainty in the institutional order, which might provide opportunities for strategic action (DiMaggio, 1988; Fligstein, 1997; Phillips, Lawrence and Hardy, 2000).

To date, scholars of institutional entrepreneurship and institutionalization have concentrated on the use of discourse as a means of mobilizing activities (Battilana et al., 2009). Whilst this research has resulted in a greater understanding of some of the processes underlying institutionalization (Phillips, Lawrence and Hardy, 2004) and strategies for institutional change (Munir and Phillips, 2005; Zilber, 2007), the role of measures and metrics in these processes has been understudied (Déjean, Gond and Leca, 2004). To address this, scholars have recently employed the work of Foucault (1994) to argue that the way in which measures are defined and evaluated influences the definition of the activity, and hence its institutionalization, calling for further research that incorporates the role of measures in institutionalization (Déjean et al., 2004).

We develop our ideas drawing on a longitudinal case study of knowledge transfer activities in U.K. higher education establishments between 1994 and 2008. The initial period 1994-2002 was one in which a new organizational practice diffused, consistent with many other innovations (see: Tolbert and Zucker, 1983), in large part based on the potential for the new practice to deliver new economic value. At the beginning of the second period (2003-2008) the organizational practice was threatened on pure economic criteria. During the remainder of the period we examine the process through which the organizational practice became institutionalized. We observed how

the nature of discourse and metrics were shaped and re-shaped to promote institutionalization, but also how discourse and metrics needed to be aligned to prevent one dimension undermining the effect of the other.

INSTITUTIONALIZATION THROUGH DISCOURSE AND METRICS

A substantial stream of recent research links discourse to institutions and suggests that institutionalization corresponds to the development and maintenance of a common discourse (Philipps, Lawrence and Hardy, 2004). Drawing from literature on social movements, the authors explain how promoters, such as institutional entrepreneurs, convince other agents to support their project by developing discourses that will resonate with their interests and values (e.g. Creed, Scully and Austin, 2002; Fligstein, 1997; Rao, Morril and Zald, 2000). Discourses are developed on the basis of pre-existing frames that are identified as important for potential allies. Actors employ rhetorical strategies to develop institutional vocabularies of recurrent phrases, references and texts (Suddaby and Greenwood, 2005). Zilber (2007) also insists on the importance of paying attention to the stories that are developed by promoters to maintain the established institutional order. The legitmacy of the discourse is enhanced through professional associations, which help in the structuration of new activities (DiMaggio and Powell, 1983). Agents need to achieve both social recognition for the activity, and potentially attract a critical mass of practitioners. Such associations operate to promote the social recognition of their members and their interests, acting both to claim and secure those jurisdictions (Lounsbury, 2002; Tolbert, 1991).

As highlighted in our introduction, although the discursive dimension of institutionalization has received significant attention in the literature on institutional entrepreneurship (Battilana, 2009),

recent institutional theory research has highlighted the importance of measurement as a tool to legitimize and structure an activity. Measurement makes things commensurable – rendering things measurable, promoting standardization and comparison (Espeland and Stevens, 1998; Fligstein, 1998; Porter, 1995). The establishment of metrics in new activities likely corresponds to the development of categories along which activities will be measured and assessed. Drawing on Foucault (1994), Déjean, Gond and Leca (2004) argue that the way in which measures are defined and evaluated influences the definition of the activity, and hence the nature of the institutions. Measurement also exhibits an impression of objectivity, with numbers assumed to be "hard facts", thus allowing a discussion beyond subjectivity (Kalthoff, 2002). The selection of *what* is measured, however, is never neutral. Rather, the selection of what is being measured, and how categories are set and maintained (Lounsbury and Rao, 2004), are highly strategic issues. Once established, metrics shape the actions within the activity (Déjean et al., 2004).

To date, research has tended to focus on discourse and metrics in isolation from one another (Battilana et al., 2009; Munir and Philips, 2005; Phillips et al., 2004; Zilber, 2007), with the latter being subject to particularly scant attention (Déjean et al., 2004). This is unfortunate as research has highlighted the potentially central role that metrics can play in the establishment of a new institution (Déjean et al., 2004), yet we know very little about how actors articulate both discourse and metrics in conjunction to ensure the diffusion and institutionalization of an organizational practice. In addition, we know little about the dynamics of the interactions between the two dimensions over time. We conjecture that the institutionalization of an organizational practice will require the re-shaping of discourse and metrics, to promote the legitimacy of the practice, which is not based on simple economic criteria. Unfortunately, scholarship on institutional theory

has underplayed the dynamic aspect of the dimensions of institutionalization. For example, research shows that actors engaged in institutional strategies adapt them to comply with stakeholder demands in order to gain their support (e.g. Fligstein, 1997), yet existing research also suggests that institutional mechanisms are supposed to stabilize as institutions diffuse, including the development of institutional vocabularies (Suddaby and Greenwood, 2006) and metrics (Déjean et al., 2004). Furthermore, existing research has not explored what happens if potential inconsistencies emerge between the different dimensions.

METHOD AND DATA

Our research draws on a longitudinal qualitative case study of institutional change surrounding the knowledge and technology transfer activities of U.K. universities from 1994 to 2008. The changing nature of U.K. universities was enshrined in policy in 1993 with the publication of Waldegrave's White Paper (HMSO, 1993), which led to the creation of the Technology Foresight Programme (established 1994), the aim of which was to identify technological priorities for U.K. plc. Furthermore, in 1995, the Office of Science and Technology (OST) was placed under the control over the Department of Trade and Industry (DTI). The move underlined the government's emphasis on links between industry and research and the primary importance of wealth creation as the function of research. Historically, third stream activities at U.K. universities have largely focused on the management of industrial research contracts. Post 1985, however, universities were given the opportunity to prove that they could commercialize the technology themselves, which created an incentive for universities to become more interested in their IP, and mirrored the introduction of the Bayh-Dole Act (1980) in the U.S.

Data

Our research strategy involved collecting archival, survey, and interview data, as well as field notes and observations. First, archival data on universities, third stream professionals, research councils and government were collected from a range of different sources. We examined all of the Government's White Papers (which become legislation) between 1994 and 2008 and the full record of Hansard (which provides a verbatim account of all discussions in the House of Commons and House of Lords). Second, we examined published information provided on the websites of all of the relevant stakeholders including: government departments, funding councils, Russell Group Universities, pressure groups including Universities U.K. (which represents University Vice Chancellors), UNICO (the University Companies Association) and AURIL (the Association of University Research and Industry Liaison Officers). Third, we examined archival data from public consultations about third stream policy from universities and associated pressure groups. Finally, we reviewed commissioned research by the different stakeholders who have a vested interest in the development of third stream activities. In Gephart's terms, we were able to collate "a substantial archival residue" (1993, p. 1469) from the different published sources.

Second, we conducted two surveys over the period 2002-2004 across all universities active in third stream activities. We conducted the surveys to gauge the level of third stream activity across U.K. universities as this data was not collected by the government at this time. The surveys were conducted in conjunction with UNICO and AURIL, which enabled us to map the population of universities' third stream activities (124 in total, accounting for 98% of the total amount spent on research by the population of U.K. universities).

Third, we conducted in-depth interviews with many of the main actors in the field. The initial interviews generated a group of institutional actors that we wanted to interview, which we then

augmented through suggestions from the initial respondents. Eventually interviewees included 50 university and third stream employees and executives (including academics, administrators and knowledge/technology transfer professionals), 9 senior members of professional associations, 7 senior members of government funding bodies and government officials. In total we conducted 66 interviews, which we number 1-66 in the text. The interviews were semi-structured, ranged in duration from one to two hours, were openly recorded and afterwards transcribed.

Fourth, two of the researchers had been involved for nine years in the development of third stream activities through participation at industry conferences and workshops, consultations on knowledge/technology transfer policy with government ministers, policy makers and industry representatives, and conducting and disseminating the survey (as mentioned above) in conjunction with UNICO and AURIL. Through their engagement with the field, extensive field notes and observations were generated.

Analysis

The data were analyzed as follows. First, we began by reading all of the government reports, industry reports and government legislation to gain a detailed chronology of events. The chronology listed key events such as government legislation and investment, and key university strategic actions. Using the chronology we were able to order our archival materials and contemporary interview data into our initial "data bank" (Gephart, 1993). We focused on the field members' actions, embracing all key stakeholders, and in doing so accounted for how those different field members reacted to each other's actions.

Second, we then analyzed the data drawing on methods suggested by Langley (1999) to

perform longitudinal research. The data bank was subjected to a process whereby we read all of the text closely and highlighted all text segments that outlined activities pertaining to the development of knowledge/technology transfer activities in U.K. universities. Our strategy involved examining the text in a broad sense so that we minimized the possibility of rejecting relevant information. Based on our reading of the text segments, we then began to arrange these segments chronologically to produce the reconstructed story (see: Greenwood et al., 2002).

Third, we undertook temporal bracketing, consistent with the approaches of Barley (1986), Doz (1996) and Denis, Lamothe and Langley (2001), dividing the period into two on the basis of continuity in the activities within each period, and discontinuity at the frontier between the two (see: Langley and Truax, 1994). In addition, we validated our temporal brackets by returning to a number of our key interviewees in order to validate our decisions (see: Denis et al., 2001). Our first period runs from 1994 to 2002, which we labelled the "diffusion period". The second period runs from 2003 to 2008, which we labelled the "institutionalization period".

Fourth, we used the two time periods as comparative units of analysis for the exploration of theoretical ideas (Langley, 1999). First, we took each of the individual text segments and coded them by the different themes that emerged from our data. Consistent with Suddaby's (2006) approach to grounded theory, we focused on themes relating to discourse and metrics. Second, we then sought to examine the interplay between the discursive and technical dimensions. Throughout the process our focus, consistent with process analysis, was to explain "what changed over time and why?" Below we present the first order analysis, based on the actors' own words, and then progress to second order abstraction and theorization in the discussion section (Van

Maanen, 1979), exploring patterns of change, and the interplay between discourse and metrics, linking our ideas back to the literature.

THE DIFFUSION OF A NEW ORGANZIATIONAL PRACTICE: 1994-2002

The Waldegrave White Paper (HSMO, 1993) outlined a new social contract for universities in terms of their role in society, including their relationship with industry. The new social contract clearly stated that universities needed to become more relevant. The incoming Labour government of 1997 embraced the new social contract and sought to build on it, outlining their policy towards universities in their White Paper *Learning to Succeed* (DfEE, 1999). Although the policy was, in many ways, a continuation of that of the previous Conservative administration, there were a number of important changes.

The Labour government was willing to listen to the suggestion that third stream activities needed to be funded by the government. The important policy initiatives introduced, to which substantial funding was attached, included: Higher Education Reach Out to Business and the Community (HEROBC, launched 1998), Science Enterprise Challenge (SEC, launched 1999 to stimulate entrepreneurship within HE) and later the Higher Education Innovation Fund (HEIF, launched 2001). For the first time, dedicated funding had been provided for universities to engage in commercialization activities, provided on the basis of a bid and deliver system, which was used to encourage behavioural change.

During the early days there were high degrees of uncertainty around the activity, as reflected by one senior university manager: “The injection of some government funding helped the setting up of offices and gained some momentum, but it was still quite fractured. What was being designed was a series of offices and/or companies to engage in this activity, but not having an

idea of how it fitted with the overall mission of the university. It was something universities felt they should be doing, but not necessarily understanding why." (interviewee #17)

As a result of the provision of dedicated funding, the number of knowledge/technology transfer offices increased dramatically as the organizational practice diffused – see figure 1. Prior to 1984, there were just 4 technology transfer offices in the UK, yet by 2003 a total of 117 knowledge transfer offices had been established, with 75 established between 1994 and 2001 (Authors' own data). The early adopters of the organizational practice were overwhelmingly represented by the research elite universities, which potentially had the most to gain from the commercialization of IP. In contrast, the later adopters were more motivated by being able to demonstrate engagement with industry as well as potential commercial returns. With the diffusion of the organizational practice there was also a sharp increase in the number of people working in the industry, with the mean number of technology transfer staff employed at a Russell Group university standing at 14 by 2002 (Author's own data). The rise in activity was also paralleled by the rise in the trade associations, including UNICO which was created in 1994 with a focus on technology commercialization, and the existing trade associations that were to become AURIL (which merged and re-branded in 1998), with a broader membership that included more post-92 universities and a wider remit of knowledge transfer.

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Discourse

During this period the focus of government attention was primarily centered on the commercialization of IP. There was an assumption that universities' IP was valuable and would

generate income through licensing and spinning-out companies based on university technology. Interest in IP and spin-out companies was fuelled by a number of high profile success stories and the rise of the technology bubble in the U.S. (and to a lesser extent the U.K.). The rhetoric of the Blair administration emphasized the importance of technology and the role universities should play in developing the "new economy". The increased interest in technology commercialization led both government and universities to look to the U.S. for guidance on how to transfer technology. The creation of the Cambridge – M.I.T. link-up in 2000, funded by the British government, was an exemplar of how the U.K. looked across the Atlantic for lessons in TT.

Brian Fender, as head of HEFCE (1995-2001), was instrumental in changing the funding landscape in the U.K. He introduced funding for technology as a "third stream" of funding for higher education. This third stream was supposed to "promote and support interaction between higher education and business, encourage knowledge and expertise transfer and help enhance teaching and research programmes for the benefits of students, employers and the economy".[1] Presenting the activity as a "third stream" enabled a wide consensus between different stakeholders, including academics, university vice-chancellors and government officials who could all relate their interest and values to this broad definition. Fender persuaded the DTI and a number of other departments outside the Department of Education and Skills to provide funding for the consolidation and support of commercialization activities. This led to the development of substantial backing from the public purse for the processes in universities that lead to successful technology transfer.

[1] (http://www.hefce.ac.uk/News/hefce/2001/bus_fells.htm). Accessed 03/01/08.

Consistent with its rhetoric about entrepreneurship and technology transfer, the government sought to encourage spin-out formation through two specific initiatives. First, SMART awards (launched 1997) provided funding for small businesses to enable them to develop new products and processes. Second, University Challenge Funds (UCF, launched 1999) saw the government establish a number of risk capital funds for investment in spin-off companies. The funds were created as a response to the perceived funding gap for early stage, and particularly high tech, companies (Wright, Clarysse, Lockett and Binks, 2006).

During this period universities were keen to embrace the new discourse of technology transfer. Increasingly, the rhetoric of third stream activities focused on the potential financial gains from transferring technology from universities to the market. By adopting the new discourse, universities were able to key into the government's agenda of technological commercialization in order to attract current and potential future funding for such activities. The Science Minister, Lord Sainsbury, launched a new guide, "Managing Intellectual Property", designed to help universities safeguard their creations and inventions. In addition, third stream professionals, by using the new discourse, were better placed to lobby university managers for the use of internal funds for technology transfer. The change in discourse enabled third stream professionals to better sell the business case of third stream activities. The culture within academia was changing to one that was more receptive to the idea of business. As one head of a knowledge/technology transfer office noted: "Up to the mid-1990s university technology transfer in the U.K. was, to all intents and purposes, non-existent. The knowledge transfer theme was focusing on research publication and teaching, the traditional university methods of knowledge transfer" (interviewee #6). However, just five years later a DTI officer observed "a very sharp increase in the number of

people employed to work at interface (with industry)" (interviewee #64). Academics increasingly became interested in the "business of science", with the traditional discourse of "sharing knowledge for the benefit of all" increasingly supplanted by the discourse of "protected IP and financial returns". One knowledge transfer officer explained that: "Universities were all starting to take it seriously and starting to invest some money in their (knowledge transfer) space" (interviewee #20).

Metrics

In this period the role of metrics was two-fold. First, metrics were important for third stream professionals in trying to gain resources from their universities. If professionals could demonstrate that other universities were investing in third stream activities, they would be better placed to lobby for more funds from their own vice chancellors. During this phase UNICO was particularly prominent in playing an active role in promoting the use of metrics as a means of lobbying for additional resources from both government and university managers for technology transfer. Second, the advent of dedicated government funding for third stream activities sparked debate about the use of metrics, with the way in which the new funding was allocated subject to considerable politicking. At the time the government believed that the commercialization of university IP could generate substantial financial returns, which arguably drove the design of the funding mechanisms, which saw the majority of the new investment go to the established research-based universities. The government's desire for metrics was driven by their need to show the performance benefits of the third stream funding. In essence, increases in government funding needed to be justified on the basis of outcomes.

University managers and third stream professionals, however, were not homogeneous in their approach to metrics; specifically there was a distinct difference between the pre and post-92 universities. Prior to formally coming under the same funding body as older established universities, the post-92 universities were funded by local authorities and subject to what may be regarded as a more bureaucratic accountability regime. To the extent that these universities maintained such a management regime and were less well-funded for research than the older established universities (and also generally received less government research funding through RAE/REF), they perceived there to be significantly higher barriers and challenges to developing spin-out companies. Consequently, the post-92 universities tended to emphasize more the role of reach-out to industry and the local community, whereas the greater emphasis in pre-92 and Russell Group universities especially was on technology transfer and commercialization through spin-outs and licensing. It should be noted also that some of the less research intensive pre-92 universities emphasized reach-out and were strong advocates for its inclusion in the metrics.

The distinction between the pre and post-92 universities was also reflected in the membership and interests of UNICO, which was largely governed by actors drawn from the pre-92 universities. As mentioned above, UNICO played a central role in the promotion of metrics surveys, which were focused around “measuring the measureable” (meeting with UNICO chair – field note) by focusing on the number of spin-offs, licenses, and the revenue generated etc. The metrics they promoted very much linked into the discourse around the commercialization of IP and technology transfer that was prevalent at the time. UNICO, as a technology transfer association, were keen to provide timely information in a context where there was a demand for hard evidence on the extent of activity. In contrast, AURIL, whose membership was broader (encompassing many more

post-92 universities), were also seeking to measure, and to have incorporated into the metrics, reach-out activity more broadly that would have a general economic development impact in terms of industry sponsored PhDs, SMEs that universities had worked with, student placements, secondments, etc. (meeting with AURIL chair – field note).

The UNICO survey for the financial year 2001 was largely focused around the metrics of investment in technology transfer (i.e. spend on legal protection of IP; dedicated staffing etc.), the short run indicators of technology transfer (i.e. patents filed, license agreements, spin-out companies etc.) and technology transfer outcomes (i.e. licensing income, financial returns from spin-outs etc.). The data showed that there were significant differences between the pre and post-92 universities, with the former reporting much higher levels of activities. Furthermore, there was significant variation across pre-92 universities in terms of the metrics, particularly with respect to outcomes, which was rationalized away as the technology transfer industry was still in its infancy and it would take time for the commercial outcomes to flow through (Authors' own data).

Additional survey research during this period revealed that the post-92 universities had significantly less clear strategies for spin-out companies and tended to rely more on links with local training and enterprise councils and business link organizations compared with pre-92 universities (Lockett, Wright and Franklin, 2003). The use of metrics that simply measured the number of spin-outs created, even though the value created and the universities' ability to add value was likely to be low (Clarysse et al., 2005), could enable less research intensive newer universities to demonstrate their involvement in this aspect of third stream activity.

The surge in interest in spin-offs was promoted by the government's provision of dedicated third stream funding. Arguably, many companies were established because of the need to look entrepreneurial rather than for the purpose of substantial wealth creation. The head of one knowledge transfer office described the emerging scenario "About 2000 there was a strong emphasis on spinouts but very little real understanding of how you go about spinning-out companies from universities …. So in the early days there was an explosion of pretty bad companies that were generally underfunded, under managed and under resourced" (interviewee #13). A knowledge transfer professional at another university noted "…if you were spinning-out lots of companies it made it look as though you were doing great technology transfer. But were they sustainable? Were they really a good business model? Was it the best thing to do? Would we be better licensing? I am very skeptical about the metrics used" (interviewee #21).

During this period we see university actors being keen to demonstrate that they were engaging with industry and transferring technology. This was a necessary activity if they were to continue to attract government funding for their third stream activities. The rise of metrics, coupled with the changing nature of discourse, worked together to promote the diffusion of third stream activities across the sector.

THE INSTITUTIONALIZATION OF AN ORGANIZATIONAL PRACTICE: 2003-2008

During this period two major events caused the government to reflect on its policy of focusing narrowly on the commercialization of IP. First, the introduction of the Schedule 22 of the Finance Act 2003 effectively stopped universities spinning-out companies for a period of 18 months. Schedule 22 hit academics in university spin-out companies with an open-ended tax bill before they saw any return on their investment. Prior to Schedule 22, academics were considered

investors and only liable for Capital Gains Tax on any increase in the value of those shares (Meyer, 2005). The impact of this Act preceded its enactment as its effects were well predicted by the professionals in the field, with academics and universities looking at different modes of commercialization.

Second, it became clear that spin-outs and licensing were not going to be able to generate large sums of money to part-fund university activities. Richard Lambert, the ex-editor of the Financial Times, was commissioned by Gordon Brown to examine the linkages between universities and business, and concluded that: "Many U.K. universities are still seeking large financial returns, which is unrealistic and is likely to reduce the broader benefits of their research. Public funding for technology transfer offices in universities is not intended to generate large new revenue streams and the U.S. experience shows that it will rarely do so. Its main purpose is to enable universities to maximize the wider impact of their research" (Lambert, 2003, p. 49). The combined value of the spin-outs listed through the nine IPOs in 2004 was £604 million (HMRC, 2005). However, the financial return to universities would only be a fraction of this figure.

The two events threatened the existence of the new organizational practice. One HEFCE officer explained: "Even in good examples like MIT, it became obvious that the amount of income generated is relatively limited so the rationale should be delivering benefit to society" (interviewee #66). In order to ensure the continued existence of the new organizational practice, there was an imperative for actors seeking to maintain (and even increase) dedicated third stream funding to re-shape discourse and metrics away from the economic logic of technology transfer to the broader notion of knowledge transfer.

Discourse

Discourse in this period was very much shaped by the Lambert report (2003). Lambert, who developed his ideas through extensive consultation, took a holistic view of third stream activities, arguing against a narrow focus on IP and financial returns. The report was highly influential on government policy and informed the subsequent White Paper on the Future of Education (DfES, 2003). Under the new system the focus was to shift back from technology to knowledge transfer, and for universities to play a more important role in science, technology and economic activity in the regions. The Education and Skills Secretary, Charles Clarke, stressed the importance of "increased knowledge transfer and innovation from higher education to the user community, through the development of Knowledge Exchanges"(DfES Press Office, 2003, p. 1), and whilst AURIL had been founded to support technology and knowledge transfer practitioners, it was the latter aspect that was becoming increasingly emphasized.

The policy shift meant that research intensive and less research intensive universities were to receive funding to stimulate third stream activities in their region. In doing so, the broadening of the third stream activities agenda further complicated the ambiguity over the appropriate metrics for the third stream funding.

Post Lambert, the government was amenable to shifting the focus of third stream activities. A source at the DTI explained "In the early stages there was a belief that it was all about licensing and spin-off companies and it is becoming more obvious that while these things are important they represent a fragment of the value that industries can get from universities" (interviewee #64). The continued expansion in the numbers of students entering higher education, and the government's desire to place universities at the centre of their science and technology agenda, ensured the government had little to gain by the collapse of the third stream agenda. Arguably,

all parties had an incentive to ensure the success of the third stream agenda and the government's willingness to listen meant that their understanding of what a university-business interface should be could be shaped over time.

The head of business and community policy at HEFCE, Alice Frost, noted the transition away from pure technology transfer, emphasizing the change from a STEM focus (science, technology, engineering and mathematics) to all disciplines, from a simple "transmission" model of knowledge to a dynamic exchange model, and from a focus on wealth creation to an appreciation of aspects such as innovation, productivity, quality of life, cultural enrichment, civic development and community regeneration (Frost, 2011, p. 4).

The broadening of the focus of third stream activities meant that internal funding for such became less attractive for universities. Without the lure of financial returns from the commercialization of IP, universities were less willing to invest their own money. One knowledge transfer professional commented that: "IP is a strand, but it's not terribly important in comparison with working with industry or research funding and we don't really want to put much university resource into it" (interviewee #47). The changes resulted in university managers and knowledge transfer practitioners returning to their original focus on research. The function of third stream activities may be to facilitate an interaction with industry, but research rather than commercialization again became the focus of activities. For many universities, IP became less of an issue, with universities keen to develop a better balance between commercialization and knowledge transfer more generally.

Given the government's interest in the third stream agenda, university managers and knowledge transfer professionals increasingly looked to government for more third stream

funding. Due to the political difficulties in attracting additional funding for teaching and research, third stream activities provided a source of new income for universities. The rhetoric employed by university vice chancellors was that third stream activities were weakly funded in comparison to the funding of teaching and research in universities. Universities U.K. argued that the budget of £238 million over two years HEIF "represents only 2% of HEFCE's annual grants to higher education institutions. The third stream remains weakly supported compared to the other two streams of funding, and this should be addressed" (Universities U.K., 2006). The argument about relative funding of third stream activities was also invoked by knowledge transfer professionals. Caroline Quest, who had just been elected Vice Chair of AURIL, wrote in June 2006 that: "dedicated funding, such as from HEIF, nowhere near counterbalances the significance of these influences. Achieving the government's vision of a knowledge-driven economy requires effective and better support from the research councils" (Quest, 2006).

The discourse of third stream activities had changed. After the Lambert report the focus became knowledge rather than technology transfer. Furthermore, the arguments surrounding third stream funding were increasingly focused on the principal of relativity to both teaching and research.

Metrics

The government was interested in measuring the effectiveness of third stream activities in order to justify spending public money on it. The broadening of the third stream agenda, however, created considerable ambiguity as any dedicated funding needed to be allocated across universities. Under HEIF 1 (2001-2004) and HEIF 2 (2004-2006), funding was allocated following a bid and deliver process, where metrics were one input into the funding allocation process. In

contrast, in the move to HEIF 3 (2006-2008) the government signaled that 75% of funding was to be allocated on the basis of a formula employing third stream metrics. At the beginning of the period HEFCE/HEBI were undertaking preliminary work to provide a broad overview of third stream activities to feed into government metrics and the funding formulae. Consequently, metrics (and by association the funding formulae) became a battle ground for the different stakeholders as the head of one knowledge transfer office observed: "Communication has become increasingly fraught as the HEIF funding allocation mechanisms have moved from a subjective analysis to a more objective analysis with the formula-based allocation" (interviewee #43).

The government wanted to see figures that showed output, which they could use to justify public spending. Statements by the House of Commons Science and Technology Committee highlighted the government's desire for such output-based metrics. For example: "We welcome the publication of the Research Council performance assessment metrics but consider that refinement is required. We are particularly concerned that the Output 2 metrics, as they stand, measure activity rather than output and that this may influence the activities of the research community. We recommend that the Research Councils and RCUK regularly review the assessment metrics and the impact they are having, reporting back periodically" (House of Commons Science and Technology Committee, 18th October 2006).

In contrast, university managers and knowledge transfer professionals faced the problem that many aspects of third stream activities are difficult to measure and a narrow focus on the financial returns to IP did not provide compelling evidence for increasing spending on such activities. At this time, from our interviews it was apparent that UNICO felt more vulnerable to policy criticism

over the performance of their members. Furthermore, UNICO's narrow focus on commercialization outcomes was only one dimension of the broader knowledge transfer discourse as promoted by AURIL. Nonetheless, there was a recognition of the need to work together both to signal the extent of technology and knowledge transfer activity nationally and because targets and monitoring of third stream activities for all universities were on the government's agenda. By working in parallel with the emerging HEBI survey, the aim of UNICO and AURIL was to shape the government's use of metrics (meeting with UNICO and AURIL representatives – field notes).

Initially, however, there was considerable resistance from UNICO to collaborate with AURIL on the survey of technology commercialization covering financial year 2002, and even when an agreement to cooperate was agreed in principle, there was substantial politicking around what was to be measured (authors' field notes from meetings with UNICO and AURIL members). Agreement was finally reached, which resulted in a broader range of knowledge transfer metrics, including the technology transfer metrics of the UNICO-NUBS survey of the previous year. In the event, by incorporating AURIL members, a much higher response rate was achieved compared to 2002, enabling a greater level of technology commercialization to be claimed (UNICO/NUBS/AURIL, 2003). Indeed, the report on 2002 activity contained a compromise summary based on comparisons involving the same respondents in the two years (which showed a decline in activity on some measures between 2001 and 2002) and a spurious summary based on comparing the smaller 2001 sample with the results from the larger 2002 sample, which showed an increase claimed (UNICO/NUBS/AURIL, 2003).

In addition the professional associations and in order to shape the debate over metrics, the Russell Group of universities (the leading pre-92 research-based universities in the U.K.) commissioned SPRU (the Science Policy Research Unit at the University of Sussex) to produce a report on the measurement of third stream activities (see: SPRU, 2002). Their main argument was that government should be measuring the extent of third stream *activity*, rather than the *impact* of each category of activity. The report's authors argued that any impact data in the area of third stream activities is "extremely skewed, uncertain and often attributable to serendipity" (SPRU, 2002, p. 62). Furthermore, the contribution of universities to society is complex and non-linear, and universities will differ in the focus and balance of their knowledge transfer activities. Consequently, it is important that any system of metrics embraces the notion of a "variety of excellence" (SPRU, 2002, p. 9). The authors also argued that while metrics associated with commercialization may be available, it is important to focus on activity measures that may be more difficult to measure quantitatively, but which may actually present a more accurate picture of the overall economic and social benefits of third stream activities.

Concern over the use of metrics continued to create anxiety for knowledge transfer professionals. The newly elected chair of AURIL commented that: "Of course, there are many problems associated with evaluating the wider impact of research and knowledge transfer activity. There is seduction in numbers, and ongoing concerns about the formulae of metrics of the Higher Education Funding Council of England's Higher Education Innovation Fund and its RAE assessment, for example, illustrate that there is already too much reliance placed on quantitative short-term output indicators" (Quest, 2006).

Towards the end of the period the third round of HEIF funding (2006-2008) saw increased weight given to the concerns of the university managers and knowledge transfer professionals by ensuring a funding formula that gave support for a broad range of knowledge transfer activities. In bolstering the knowledge transfer profession's position further, an additional report commissioned by UNICO (2008) on metric selection drew comparisons with measures used in both the U.S. and Canada. The report noted that many countries have developed measures in line with the U.S. model, centered around the collection of revenues from IP, but that "it has recently been recognized that measurement of income from IP is an incomplete and poor measure of knowledge transfer performance" (UNICO, 2008, p. 3) and that "the U.K. appears to be ahead of the U.S. in terms of collecting and publishing a broad range of data on knowledge transfer activities…" (UNICO, 2008, p. 20). The UNICO report keenly emphasized "the more advanced state of measuring knowledge transfer activities in the U.K. compare to the U.S." (UNICO, 2008, p. 24).

DISCUSSION

Initially discourse and metrics were used to diffuse the new organizational practice. As we highlighted upfront, the logic for the diffusion of the new organizational practice was based in part on the value of the changes for the internal functioning of the organization. During the period of diffusion, the challenge for the field was to convince the two main stakeholders (university managers and government) of the value of their activities. The increase in resources attracted into third stream activities was done so using a discourse of technology commercialization and the desire to raise revenues from commercializing IP. Over time, however, it became clear that the financial returns that materialized from IP were disappointing. Consequently, the future of the organizational practice was questioned on pure economic criteria, which created the need for

actors with an interest in promoting the organizational practice to seek its institutionalization. Through the case evidence above, we show how actors faced the imperative of needing to institutionalize the new organizational practice.

> *Proposition 1: Where the discourse and metrics employed to diffuse an organizational practice are questioned on simple economic criteria, an imperative is created for actors to engage in institutional work to promote the continued existence of the organizational practice.*

In response to the imperative to engage in institutional work to promote the continued existence of the organizational practice, actors engaged in re-shaping both discourse and metrics. First, actors sought to frame the discourse to align it with that of the main stakeholders. Specifically, we see a shift in the discourse away from "technology transfer" and the lure of financial returns, which had been employed to promote the diffusion of the organizational practice fueled by a government keen to divert additional funding into third stream activities during the high-tech boom when there were a series of high profile spinouts at U.S. universities. The shift from technology transfer back to knowledge transfer occurred with the publication of the Lambert report, as actors repositioned their discourse. The Lambert report pointed out that large financial returns were unlikely to be obtained by technology transfer, which threatened the existence of the organizational practice on pure economic efficiency grounds. Consequently, actors adapted their discourse to rebrand their activity as knowledge transfer, emphasizing its breadth and suggesting that it should not be limited to technology commercialization. The new discourse was designed to resonate with government concern that universities should be useful to society. Crafting discourses that resonated with these interests and values (Creed et al., 2002;

Fligstein, 1997; Rao et al., 2000) ensured that there was a logic for the government to invest in knowledge transfer.

In addition to the re-shaping of the discourse to resonate with the interests of the main stakeholders, the discursive strategy employed drew on the notion of knowledge transfer being part of a “third stream” of activities. The notion of the “third stream” was developed to designate and distinguish the universities’ activities beyond teaching and research. The idea of a third stream was intentionally broad, to cover activities associated with the use, application and exploitation of knowledge outside of the university sector. In essence, the notion covered the interactions between universities and society at large, and became an important element of governmental vocabulary as the concept of “third stream” appeared as an appropriate way to justify the public policy. Government was willing to support the universities, given the increasing number of students in HE, but found it politically difficult to provide additional funding for teaching and research. Using the “third stream” allowed the government to provide additional funding for universities, by emphasizing a concern for relevance and societal benefits, in harmony with the new dominant narrative in higher education. Furthermore, in promoting the idea that universities were contributing to society at large, the third stream was an important element in demonstrating to the world that universities were “useful”, which was particularly important at a time when students were being asked to fund their own education directly.

In order to conceptualize the discursive notion of the “third stream” we draw on previous research on robustness (see: Hargadon and Douglas, 2001; Padgett and Ansell, 1993). Robustness refers to the "multivocal" (or "polyvalent") actions (Padgett and Ansell, 1993) or designs (Hargadon and Douglas, 2001), which can be interpreted coherently from multiple perspectives

simultaneously. We suggest that the notion of the "third stream" constitutes a "robust discursive notion", which similar to actions and designs, can mean many things to many people. When dealing with a number of different stakeholders, and when needing to ensure that the chosen discourse resonates with them, such robust discursive notions help facilitate agreement across multiple stakeholders. In our specific case, we argue that the robust notion of the "third stream" contributed to the legitimation of both the specificity of the knowledge transfer units and the government funding policy. Actors from the knowledge transfer profession and university managers were able to play on the polyvalence by arguing that the direct financial returns to knowledge transfer would not be high, however, if universities were to occupy a central role in the knowledge society, with close linkages to industry, additional funding would have to be provided for third stream activities.

> *Proposition 2: Actors who seek to promote the institutionalization of a new organizational practice will attempt to align discourse with key stakeholder discourse and/or institutional outcomes through the use of polyvalent discursive notions that can serve the interests of multiple stakeholders.*

To date, scholars of institutional theory have highlighted the importance of measurement as a tool to legitimize and structure an activity (Espeland and Stevens 1998; Porter, 1995). Whilst measurement may give an impression of objectivity (Kalthoff, 2002), the selection of what is measured may be far from neutral, with the metrics chosen having an important role in deciding what is revealed and what is concealed. Although an under-researched area, existing studies primarily suggest that once established, metrics will remain stable, providing structures to monitor actions and make decisions (Dejean et al., 2004). In contrast, our research suggests that metrics may need to remain flexible over time in order to facilitate the institutionalization of an

organizational practice. In our study we found that metrics were used with the same flexibility as discourse. Again, drawing on the work relating to robustness (see: Hargadon and Douglas, 2001; Padgett and Ansell, 1993), we argue that the actors promoted the institutionalization of the organizational practice using robust metrics.

The robust metrics were designed to address the demand of the public authorities for performance measurement and act as a way to evaluate and support decision-making. With significant financial implications associated with their use, the way in which the metrics were designed became an important concern for all. The government wanted to see figures that displayed outputs in order to justify public spending. However, universities and knowledge transfer professionals became acutely aware that a focus on financial returns would not provide sufficient evidence for a continuation of funding, thereby threatening the continuation of the organizational practice. As measures proved unsatisfactory, knowledge transfer professionals managed to change what was measured by broadening the items and categories, emphasizing "activity", as opposed to "income".

Promoters of third stream activities shaped metrics to promote the institutionalization of the organizational practice by arguing that income was an unreliable measure of the effectiveness of knowledge transfer activities. In advocating a much greater range of indicators (i.e. robust metrics) as to the efficacy of knowledge transfer, including a shift of emphasis from income to activity-based indicators, actors were able to provide stakeholders with a far greater flexibility with respect to how to interpret the performance of universities' knowledge transfer activities. Researchers have already established that measures both reveal and conceal. What is measured is likely to change depending on what is more likely to support the success of the established

structures. Where the metrics expose the viability of an organizational practice, actors with an interest in institutionalizing the practice will seek to promote robust metrics that can be employed by multiple stakeholders to demonstrate the efficacy of the organizational practice. Hence:

> *Proposition 3: Where metrics risk exposing the economic viability of an organizational practice, actors seeking its institutionalization will attempt to shape metrics that are aligned with the interests of multiple stakeholders.*

Finally, our study suggests that the institutional work around discourse and metrics was not conducted in isolation from one another. Rather, actors undertook work to ensure that there was alignment between the re-shaped discourse and metrics. The changing nature of discourse, to promote knowledge translation, would have been difficult to sustain if the metrics measuring performance had continued to be narrowly based financial returns to IP. In such a situation, the income-based metrics would have undermined the new discourse around knowledge translation and so hindered attempts to institutionalize the organizational practice. The promotion of activity-based metrics, aligned to the discourse of knowledge transfer and the "third stream", was a solution to the problem. In addition to removing the inconsistency between the income-based metrics undermining the strategy of institutionalization, the alignment of robust (activity-based) metrics to the robust discursive notion of the third stream enabled actors to provide "hard facts" to support the discourse. In essence, the new metrics enabled actors to support their new discourse, which in itself may be viewed as subjective, with data that was beyond subjectivity (Kalthoff, 2002). Hence:

> *Proposition 4: The effectiveness of institutional work to promote the institutionalization of an organizational practice will be enhanced when there is alignment between discourse and metrics.*

POSTSCRIPT POST 2008: IMPACT

As a postscript, it is interesting to note that discourse and metrics surrounding the institutionalization of third stream activities have continued to evolve post 2008. In essence, there remains a continued tension over the use of metrics for third stream funding, particularly post the financial crisis and the coalition government's concern for financial parsimony. During the 2003-2008 period third stream professionals, and the university sector more broadly, promoted a focus on activity rather than output due to the latter's more nebulous nature. The coalition government's position is that the HEIF funding, up until round 4, was "a universal HEIF allocation for all HEIs, reflecting that the focus was on exploring potential and building capacity. However, as set out in HEFCE 2008/02 on HEIF 4, our objective was always to move towards allocations based on performance, to deliver maximum external impact." (Langlands, 2011, p. 3).

The coalition government is now keen to move away from the capacity-building element towards a focus on incentivizing performance to deliver maximum "external impact" (Langlands, 2011), which promotes the use of financial metrics. As iterated by the current HEFCE Chief Executive: "External income gives hard evidence that the KE activity has a beneficiary outside of the HEI, and that this beneficiary believes the KE is of value … We recognize that income is an imperfect proxy for impact, but it is a reliable indicator and comparable measure that can be collected in a fairly low-burden way." (Langlands, 2011, p. 3). Despite discussions between HEFCE and HEIs concerning ways in which the measurement of volume and impact of knowledge transfer could be improved, "…there have not yet been breakthroughs" (Langlands, 2011).

The concern for "impact" has important implications for the development of U.K. higher education, particularly with respect to promoting scholarship that is relevant (Hodgkinson and Starkey, 2011; Starkey and Madan, 2001). For example, the REF 2014 saw the agenda evolve from a reliance on academics' "Best 4" publications to incorporate "impact" of research and which seems likely to become even more important in REF 2020. This shift raises continuing challenges regarding how to measure the quality of relevant research, which is an issue largely side-stepped in the relevance debate but which has implications for the design, conduct and dissemination of research. There are difficulties in measuring the quality of relevance through, say quantifying research or even consulting impact in monetary terms. We are aware of examples of universities that attempted such measurement being confronted by industry partners who are unable to estimate the monetary impact on their business. Our analysis of the evolution of technology and knowledge transfer suggests, therefore, that there remains a need to develop a more flexible and wider approach to the definition and use of metrics.

The impact of research on policy and practice may be indirect as well as direct. For example, in the management area, reseach may have an indirect impact through its incorporation into teaching (e.g., MBA and Executive Education programmes) or dissemination through practitioner articles and other new media fora. Such routes may be especially relevant given growing government attention to the importance of teaching in an environment of higher student fees. This suggests a need for the development of impact metrics that include activity as well as direct quantitative monetary amounts. With the institutionalization of the impact agenda, our analysis suggests that scholars both need to develop significant relevant research but also have a role to play in shaping how impact is measured.

CONCLUSION

In this paper we have focused on actors' institutional work around discourse and metrics, and the interplay between the two, in promoting the institutionalization of third stream activities in U.K. higher education. In doing so, we contribute to the literature in three main ways. First, we demonstrate how actors shape discourse, employing robust discursive notions, to enable them to align discourse with the interests and values of major stakeholders. The discourse around the third stream, as it was robust, could be interpreted coherently from multiple perspectives. The notion provided a high level of *polyvalence,* enabling coherent interpretation from multiple perspectives and buy-in from key stakeholders. Second, we show how actors also employ robust metrics, similar to robust discursive notions, to promote the institutionalization of an organizational practice. Using activity-based metrics, as opposed to income-based metrics, enabled different stakeholders to argue that third stream activities were effective, as opposed to judging them on narrow pure economic criteria. Third, we demonstrate the importance of institutional actors aligning discourse and metrics, as any misalignment between the two will undermine the institutionalization of an organizational practice.

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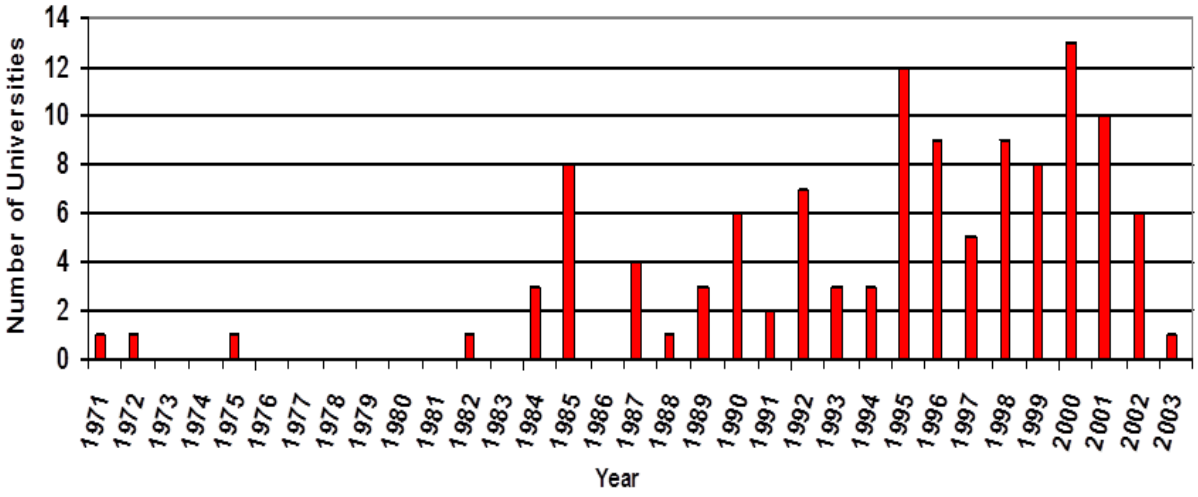
FIGURE 1
The diffusion of knowledge transfer offices



Source: Authors' own survey (n = 117 universities providing information)