



Paper to be presented at the DRUID 2011

on

INNOVATION, STRATEGY, and STRUCTURE -
Organizations, Institutions, Systems and Regions

at

Copenhagen Business School, Denmark, June 15-17, 2011

Entrepreneurship in the Academy: The Case for a Micro-Institutional Analysis

Damien John Organ

National University of Ireland, Galway
Management

d.organ1@nuigalway.ie

James Cunningham

james.cunningham@nuigalway.ie

Abstract

Academic entrepreneurship is recognised as a critical component within wider macro level initiatives centred on the realisation of innovative excellence and both regional and national economic growth.

**Title: Entrepreneurship in the Academy:
The Case for a Micro-Institutional Analysis**

Word Count: 7753

Abstract

Academic entrepreneurship is recognised as a critical component within wider macro level initiatives centred on the realisation of innovative excellence and both regional and national economic growth. While the academic entrepreneurship literature has been expanding rapidly in recent times, it is somewhat surprising that there has been at best limited exploration of the manner in which institutional pressures impact upon perceptions of commercialisation activity amongst university faculty. What shall be articulated in this paper then, is a theoretical position which establishes a research agenda for the exploration of the micro processes through which institutional pressures impact upon the behaviour of academics with respect to the perceived feasibility and appropriateness of commercialisation activity. An examination of the process through which the prevailing institutional logics are interpreted by academic researchers as cues for action poses significant potential for unique insight into the micro-foundations of technology transfer.

1. Introduction

Over the last thirty years, the role of the academy within the wider context of national economies has come under ever increasing levels of scrutiny, to the extent that the university itself has been drastically re-conceptualised as a major engine for economic growth and innovation within advanced, knowledge intensive economies (Etzkowitz and Leydesdorff 1999). The recent upheaval in the global economy has led policy makers and researchers alike to reassert the essential role of the National Innovation System in generating the conditions for sustained economic progress into the near future and beyond (Cunningham and Harney 2006). It is difficult to overstate the centrality of Higher Education Institutions and consequently of the research community within this vision. This transformation of the traditional role of higher education institutions has led to an increasing demand on the academy to generate 'useful' information and to 'transfer' it to the wider economy (Gassol 2007). As knowledge is increasingly recognised as a primary source of economic advantage, the role of the university both as a producer of knowledge and as an agent of knowledge transfer within society has become increasingly critical within projections of idealised economic conditions (Etzkowitz et al. 2000).

Central to this process is the concept of academic entrepreneurship and, as such, academic researchers are presented with an entirely new role which represents a clear and significant departure from the traditional academic behavioural set (George and Bock 2009). In their engagement with this entrepreneurial process, researchers are expected not only to discover and develop promising research opportunities, but additionally to strategically develop and commercialise their research for the creation of innovative goods and services (Benner and Sandstrom 2000).

It is argued here, that it is highly significant that such macro level initiatives centred on the promotion of research commercialisation, are heavily informed by an in-depth understanding of the manner in which institutional factors shape the behaviour of researchers at a micro level. If the desired organisational and economic outputs are to be achieved, the incorporation of these considerations into the policy making process is surely a critical factor (Bercovitz and Feldman 2008). What shall be articulated then, is a theoretical position which establishes a research agenda for the exploration of the micro processes through which institutional pressures impact upon the behaviour of academics, with respect to both the perceived

feasibility and appropriateness of commercialisation activity. As such, the discussion shall be pursued in the light of the following research question:

How do the prevailing institutional logics shape the propensity of academic researchers to engage with the research commercialisation process?

In outlining the institutional approach, the paper shall address the central institutional theory concept of legitimacy as a means of framing the ‘institutional effect’ within the relevant context. Having established the relevance of these themes the authors shall elaborate on the critical questions posed by an institutional analysis with respect to the proliferation of commercialisation activity. These questions concern the institutions power to shape both resource flow configurations and individual preferences through a highly contingent set of norms in a given context, wherein behaviour is driven not just an instrumental logic of consequences but also through a logic of appropriateness (Thornton and Ocasio 2008).

Section 2 of this paper will initially address the conceptualised roles of Higher Education Institutions (HEIs) in the knowledge economy, moving onto the emergence of the ‘entrepreneurial university’ as a phenomenon in section 3. This discussion will highlight the centrality of the academic entrepreneur within these frameworks in section 4, as well as offering an examination of the nature of the role of academic entrepreneurs. Sections 5 and 6 shall outline the theoretical background to the study with respect to key spheres of activity in the institutional context from which academic entrepreneurs are to emerge, as well as the institutional logics which define and describe the behavioural modes. Section 6 will also establish the suitability of the application of a sensemaking analytical perspective in the examination of individual level interpretations of the prevailing institutional logics. Sections 7 and 8 will offer an integrated analysis of the outlined theoretical perspectives with respect to both the institutional framework and the academic entrepreneurship construct.

Throughout this conversation the paper will highlight the importance of the utilisation of an institutional lens in the analysis of the context from which this commercialisation activity is to emerge. As such, the paper will provide a conceptual basis for the employment of an institutional analysis to this phenomenon, and in so doing demonstrate the potential for an institutional perspective to inform existing perceptions of the academic entrepreneurship

phenomenon. Finally, the proposed methodological approach shall be described before the paper is concluded.

2. Role of HEIs in the Knowledge Economy

As Brennan et al. (2007) highlight, the re-conceptualisation of the role of academic institutions has seen them characterised as not only highly important for national economies but as integral elements of such economies. Within this new capacity as creators of the knowledge that drives economic success and product innovation, the university adapts multiple roles, in terms of both the cultivation of the essential conditions for success (innovation, entrepreneurship, and management capabilities) and the creation and maintenance of the vital sources of competitive advantage (Cunningham and Harney 2006).

This characterisation reflects the new institutional perspective portrayed in Etzkowitz and Leydesdorff's (1999) triple-helix framework. The triple-helix of university-industry-government relations aims to transcend previous models of institutional relationships, and as such account for "a new configuration of institutional forces emerging within innovation systems" (Etzkowitz et al. 2000, p. 314). As Cunningham and Harney (2006) note, the emergence of the triple-helix model indicated a paradigmatic shift in the understanding of inter-institutional innovative processes, a shift which in itself arose as a consequence of four primary factors:

- internal transformation of each of the helices, and in particular the re-definition and expansion of traditional academic tasks,
- growing impact of one helix upon the other – the Bayh/Dole Act for example was a government policy radically changing the framework for university activity by granting proprietary rights of federally funded research to universities,
- new tri-lateral networks and organisations arising out of interactions between the three helices, and

- recursive effects, as the helices further develop their capacities within existing networks they develop the capacity to create new network and organisational forms.

Within this framework then, the innovative process comes to be viewed in a holistic and systematic sense within which the university plays a critical role. As Etzkowitz and Leydesdorff (1997) assert, “The development of academic research capacities carries within itself the seeds of future economic and social development in the form of human capital, tacit knowledge and intellectual property”, and as such, the challenge of channelling the flow of knowledge in society falls to the university itself. While the university has always faced a plurality of societal expectations, it is incumbent upon us here to trace a brief history of the emergence of this particular ‘mission’, which we will do in the next section.

3. The Entrepreneurial University

While certainly not the genesis, the Bayh/Dole Act represents a major point in the diffusion of the concept of research commercialisation as a significant activity for HEIs (Berman 2008). In the aftermath of this act, the utilisation of HEIs for industrial development and the stimulation of entrepreneurial activity received ever greater levels of both academic and political interest in the wider global economy (Rosell and Agrawal 2009). The consequent proliferation of both scholarly activity and political initiatives has led to a perhaps premature but nevertheless understandable proclamation of a revolution within higher education, as academics and politicians alike seek to acclaim the emergence of an entirely new economic paradigm. This new paradigm is neatly encapsulated within the triple helix model, which conceptualises economic performance and development as dependent upon the interactions within the economy of three institutional domains; namely government, industry, and the university (Cunningham and Harney 2006). As knowledge is increasingly envisioned as a primary source of economic advantage, the role of the university both as a producer of knowledge and as an agent of knowledge transfer within society has become increasingly critical within projections of desired economic states.

The recognition of this critical role then has seen the development of a ‘third mission’ for the HEI, namely the commercialisation of academic research for the purpose of economic development, complementing the existing traditional ‘missions’ of teaching and the conducting of basic scientific research. Of great significance however, is the extent to which there is scepticism with respect to the scope for faculty to engage in commercial activity while simultaneously retaining a due regard for traditional scientific values (Callinicos 2006), and these concerns account for significant variance in the perception of research commercialisation within academia itself. Additionally, the question of public good dominates the rationale for the re-positioning of the role of academic organisations in society, as the emergence of the third mission changes on a fundamental level the manner in which university research is expected to contribute to society (Glenna et al. 2007). From the perspective of an institutional analysis, these considerations have significant implications for the manner in which the challenge of commercialisation is perceived at an organisational, departmental, and individual level (Bjerregaard 2010). At the core of the literature’s efforts to explain how this challenge is approached, lies the concept of academic entrepreneurship, which is now addressed in more detail.

4. The Nature of Academic Entrepreneurship

With the increased emphasis on knowledge as the key element of sustainable economic competitiveness, the entrepreneurial potential of academia in turn increasingly found itself at the core of important debates on the subject of economic development. Academia was now confronted with both a supply and demand fuelled push towards an area of activity quite novel to the traditional, Mertonian understanding of the role of the academic. From their review of the literature, Klofsten and Jones-Evans (2000) identify and classify this ‘entrepreneurial’ activity on the part of academia under eight specific headings, each of which falls outside the normally accepted duties of academics:

- **Large scale science projects** (obtaining large externally funded research projects)
- **Contracted Research** (Specific research projects within the university system for external organisations)

- **Consulting** (the sale of personal scientific or technological expertise to solve a specific problem)
- **Patenting/licensing** (exploitation of patents of licences arising from research by industry)
- **Spin off firms** (creation of a new firm or organisation to exploit the results of university research)
- **External teaching** (providing courses for non-university personnel and external organisations)
- **Sales** (selling of products developed within the university)
- **Testing** (providing of testing and calibration facilities to non-university individuals and external organisations)

Such activity clearly represents a departure from traditional notions of academic behaviour, and as Garrett-Jones et al. (2005) note, reflects far-reaching changes in the relationship between science, industry, and society. The increased susceptibility of academic activity to both market forces and social expectations, in turn serves to accentuate the cultural contrast between the academic environment and the industrial one. As Cunningham and Harney (2006) demonstrate, these cultural differences are many and they are extensive. Similarly Siegel et al. (2003) asserts that there is an essential conflict in the primary motivations of the university scientist on the one hand, and the firm or entrepreneur on the other. Additionally, these motivations are continually reinforced by the demands of the relative institutional environments.

What is noteworthy when one conducts a definitional examination of the academic literature, is the extent to which academic entrepreneurship is regarded more as a phenomenon, than as a clearly defined role. As such, the organisational and role context of their behaviour is deemed to distinguish academic entrepreneurs from others who are engaged in entrepreneurial activity. Nevertheless, for the purposes of terminological clarity and in the interests of distinguishing academic entrepreneurship from wider interpretations of entrepreneurship as an activity, a definition developed Brennan et al. (2007) is offered here;

an academic entrepreneur is someone who:

engages in related entrepreneurial endeavours, as an adjunct to their academic activities.

While there appears to be growing consensus then, as to the nature of both entrepreneurial academic activity itself and the potential conflict which it entails, there is in stark contrast, as Bercovitz and Feldman (2008) illustrate, a growing gap in the literature with respect to the institutional factors that differentiate the strategic behaviour of academics and in particular impact upon their inclination to become academic entrepreneurs. This is borne out by the dramatic variance in entrepreneurial performance across academic institutions (D'este and Patel 2007). Therefore, the paper will now address this institutional context and its implications for research commercialisation activity. The first part of the discussion shall briefly examine the institution specific capabilities recognised within the literature as fundamental to the realisation of the entrepreneurial university. The identification of these spheres of activity provide crucial focal points for the analysis of institutional engagement with commercialisation activity, and in so doing also establishes critical themes for exploring perceptions of characteristically entrepreneurial behaviour at the individual level of analysis. With that in mind, the primary focus shall then shift to the nature of the institution and its implications for the emergence of entrepreneurially committed behaviours in the university context.

5. Key Spheres of Activity in the Institutional Context

The rapid expansion of the university entrepreneurship literature has produced predictable fragmentation and diversification within the literature. Nevertheless the significance of institution specific activity and consequently the organisational context has remained an underlying theme upon which classifications of the wider phenomenon have been built. In this mould, Nelles and Vorley (2010) advance an analytical framework for university entrepreneurship centred on the conceptualisation of organisational dynamics within the contemporary university institution. Building on comprehensive studies of the internal determinants of commercialisation activity, this framework identifies five critical themes through which the institution's framing of local entrepreneurial activity can be both further examined and understood, namely structures, systems, leadership, strategies, and culture.

Structural activity relates to the creation of support infrastructure for commercialisation activities, most notably TTOs and incubators, but also decoupling of activity, division of labour, and accounting procedures. Similarly as Henrekson and Rosenberg (2000) identify, this theme may also encompass formal incentive structures and the extent to which they stimulate engagement with third stream activity. The systems theme then concerns the configuration of linkages and networks through which entrepreneurial activity is conducted and within which researchers are embedded. These internal configurations of both formal and informal relationships are a key determinant of the embeddedness of entrepreneurial activity (Siegel et al. 2003)

The third theme within this framework relates to institutional leadership, and more specifically, the entrepreneurial orientation of key actors in the university context. This leadership can be embodied in the persons of departmental heads, star faculty members, or formal authority figures in key administrative roles. Strategy represents the fourth theme and is concerned with the formal articulation of institutional goals, as well as the measures taken to implement the strategic vision into the functioning organisation. Strategy enjoys a reciprocal relationship with the other themes in that it seeks to influence the identified spheres of activity, as well as being in turn informed by them.

Finally, culture represents the fifth dimension of the entrepreneurial university. Of the identified themes culture most intimately relates to the perceived normalisation of third stream activities at the organisational, departmental, and individual level. As Kenny and Goe (2004) assert, the cultural embeddedness of entrepreneurial activity is a powerful predictor of individual attitudes towards commercialisation activity in the relevant context.

Having elaborated on the identified themes, the paper shall now discuss the theoretical underpinnings of the institutional lens of analysis, and consequently establish its significance within the context of academic entrepreneurialism.

6. Legitimacy, Institutional Logics, and Sensemaking at the Micro-Level

An institution is a relatively enduring set of rules and organised practices, embedded in cultural-cognitive, normative, and regulative structures and activities that provide both meaning and legitimacy to social behaviour (March and Olsen 1995, Scott 1995). As argued by Meyer and Rowan (1977), the development of formal structures within organisations is a manifestation of the powerful institutionalised rules through which the organisation identifies its social purposes, and describes the appropriate means through which these purposes may be pursued. Consequently, as identified by Scott (2001), institutional theory concerns itself with the deep seated, more durable aspects of social structure, including the processes through which rules, norms, and routines are established as rigid guidelines for social behaviour. The study of institutions then, is the study of behaviour which is governed by the norm, and the challenge for institutional theorists, is the empirical analysis and description of the institutional structure within which activity takes place (Holm 1995).

Legitimacy

As the literature has developed, legitimacy has emerged as the most central concept within the theory of institutions (Colyvas and Powell 2006). In essence institutional theories focus on legitimacy as an alternative to notions of efficiency or effectiveness as guiding organisational goals (Scott 1995). As defined by Suchman (1995, p. 574), legitimacy “is a generalised perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions”. The survival of an organisation is dependent on its ability to attain legitimacy through interactions with external constituents in their environment that are desirable and acceptable within the appropriate institutional framework. Consequently, the incorporation of externally legitimated structures and behavioural processes promotes the survival and success of the organisation itself (Meyer and Rowan 1977). The institutional framework then, serves to influence what constitutes legitimating behaviour, which in turn motivates the activities undertaken by the organisation (Dillard et al. 2004).

With respect to organisational life, dimensions of legitimacy have regularly been drawn in terms of the three main pillars of institutions, the regulative, normative, and cultural-cognitive frameworks (Deephouse and Suchman 2008). Regulative institutional elements refer to rule based sanctions through which an institution regularises and constrains behaviour, normative elements to the prescriptive, evaluative, and obligatory dimensions of social interaction, and finally cultural-cognitive elements which refer to the shared frames of perception through which events are interpreted and meaning is created (Scott 1995). Thornton and Ocasio (2008) argue that these dimensions are underpinned and ordered by the prevailing institutional logics, and it is the prevailing logics of the relevant institutional framework which serve to both determine the appropriate social objectives to be pursued by the organisation, and describe the means through which they may be pursued.

Institutional Logics

As the organising principles of the field, institutional logics refer to the powerful belief systems and associated practices which provide content and meaning to institutions, and as such serve as a link between institutions and organisational actions (Reay and Hinings 2009). Townley (1997) further asserts that in underpinning the social reality of individual actors, this logic gives value and intrinsic worth to their activity. However, it is at the individual level where institutional work is carried out that major gaps appear in the institutional logics literature. As Suddaby (2010, p.17) emphasises, institutional logics, as powerful instruments of behavioural regularisation must possess a “perceptual component that operates cognitively at the level of individuals”. Reay and Hinings (2009) indicate that an awareness of the prevailing logics on the part of the individual is demonstrated through their conscious resistance to competing logics, and as observed by Townley (2002) in their tendency to engage with novel behavioural modes on as superficial a level as possible when significant contradictions are implied. What is clear then is that the legitimacy of certain behaviours, congruent with an underlying institutional logic, become part of an individual’s internal motivational system (Tyler 2006). In their evaluation of their environment, individuals in a given institutional context apply a consistent set of normative standards against which new events can be assessed (Weatherford 1991), and against which the consequences of their own attitude towards novel activities can be determined (Townley 2002).

In establishing the micro-foundations of entrepreneurial behaviour in the academy it is also incumbent upon us to utilise a theoretical perspective which enables us demonstrate the micro-process through which the individual interprets the relevant institutional logics. To this end, the authors propose the adoption of a sensemaking analytical perspective.

Sensemaking

As established by Jensen et al. (2009), sensemaking theory possesses significant complementary value for institutional theory when used to alternate between different levels of analysis, and in particular when employed as a bridge between macro level structures and micro level actions. In taking into account how social pressures and norms are internalised and reproduced through human actions, sensemaking theory holds considerable potential for the exploration of the relationship between institutional context and micro level interpretations of the third mission.

According to Weick (1995), the process of sensemaking itself is understood in terms of the following elements:

- grounded in identity construction;
- retrospective;
- enactive of sensible environments;
- focused on and by extracted cues;
- social;
- ongoing; and
- driven by plausibility rather than accuracy.

Sensemaking therefore serves as a perceptual framework for analysing responses around key issues. As established by Jain et al (2009), examining the sensemaking processes that individual academics undertake with respect to their engagement with the third mission enable us to better understand the cognitive micro-mechanisms which underpin technology transfer as a whole. In an environment where individual academic researchers are posed with potential interruption to their routines and practices through the emergence of commercialisation oriented initiatives (Bjerregaard 2010), sensemaking offers us a vital bridge whereby we can alternate between the micro level, human actor orientated

perspectives of academic entrepreneurship, and the macro focused institutional lens of analysis (Jensen et al. 2009).

7. Institutional Theory and Entrepreneurial Behaviour in the Academy

Dacin (1997) argues that institutional characteristics have important resource consequences for organisations because they shape people's tastes and preferences and as a result, the nature of their activities. Similarly Wright et al. (2009) assert that the institutional characteristics of universities are likely to have a considerable impact on the development of commercialisation processes, and consequently, are likely to play a substantial role in shaping the emergence of any behaviour which can be considered 'entrepreneurial' in the non-traditional sense. These assertions are drawn from the normative or sociological perspective of institutional theory, and as such argue for the power of normative values and standards in the shaping of individual behaviour in an institutional context (Peters and Pierre 1998). As Peters and Pierre (1998, p. 568) further propose, behaviour in institutions is greatly illuminated by the employment of a "logic of appropriateness" as opposed to a logic of consequentiality. This has significant implications for our appreciation of the context from which commercialisation behavioural processes are expected to emerge in the institutional context of the academy. As Dillard et al. (2004) suggest, the motivation of legitimacy seeking behaviours are in turn influenced by the socially constructed norms imposed by the institutional context, suggesting that there is a relationship between the extent to which commercialisation activity is considered legitimate within these social constructions, and the extent to which there exists a propensity for the engagement with such activities on the part of the individual academic.

Historical Emergence of the Entrepreneurial University

Within this theoretical context then, it is of particular importance to consider the historical perspective of institutionalism, which regards the institution as having evolved a core and dominant set of collective values which over time come to shape the organisation as deeply embedded value systems (Peters and Pierre 1998). From this perspective, change in how organisations function over time is heavily influenced by institutional forces and as such,

organisations themselves can be understood as target-oriented and rule based systems that adapt incrementally to past experience (Wezel and Saka-Helmhout (2005). As Ikenberry (1994) argues, the impact of institutional structures lies in their limitation or facilitation of the actions of individuals or groups, and consequently the interests pursued by actors within this framework are shaped by the specific historical context from which institutional rules have emerged. This perspective indicates that the implementation or in the wider sense the emergence of new practices, norms, and values is a process characterised by conflict and often by political struggle (Crouch and Farrell 2004)

This raises some interesting questions in the context of the encouragement of commercialisation activity in the academic environment. It is generally accepted that the emergence of the entrepreneurial university in the United States was characterised by a gradual evolution from the teaching institution to the contemporary research facility (Berman 2008). In contrast, European initiatives to promote the commercialisation of research have been top down in nature and as such represent an imposition of novel behavioural norms on a pre-existing institutional context (Philpott et al. 2011). It is similarly generally accepted that this contrast is reflected in a clear disparity between the institutional structures of American universities and those of their European counterparts. As has been suggested, this disparity is indicative of a wider problem facing the re-conceptualisation of the HEI as an engine for growth and consequently, of the potential for the successful adaptation of the ‘third mission’ by academic institutions. As Pant and Lachman (1998) contend, the powerful social control of such evolved value systems may serve to legitimise, or render proscribed the ‘new’ behavioural processes implicit in such strategic initiatives.

Legitimacy and ‘Taken-for-Grantedness’ of Commercialisation Activities

As referred to above, legitimacy occupies a central position within the literature of institutionalism and consequently, it is of great significance in the application of an institutional lens to the academic entrepreneurship phenomenon. Academic entrepreneurship and its emergence or otherwise is as much a socio-cultural question as it is a technical one (Krucken 2003). As Suchman (1995) argues, from a cognitive perspective legitimacy itself stems from congruence between the organisation and its cultural environment. As has been addressed throughout this paper, academic entrepreneurship as a phenomenon represents a

shift in the wider understanding of how a university is expected to contribute to society. It can be argued that this in turn can be understood as an expectation to significantly alter what Meyer and Rowan (1977) recognise as the social purpose of the organisation, and it unquestionably represents a behavioural shift in the understanding of the ‘appropriate means’ through which a university fulfils its obligations to external constituents.

As Colyvas and Powell (2006) indicate, the institutionalisation of the practice in perhaps the foremost champion of academic entrepreneurship, Stanford University, took place through sustained experience and standardisation of interaction sequences and the inculcation of duties and expectations of conduct across the organisation. Similarly, Berman (2008) argues that the taken-for-grantedness of research commercialisation only emerged after it was sufficiently institutionalised through organisational, structural, and normative structures that permitted the persistence and self-reproduction on the practice. The importance of legitimacy therefore, is repeatedly demonstrated in the examination of the emergence of academic entrepreneurship in the United States. What is similarly apparent, is that consideration of the role of the institutional environment has not received a similar level of attention in the European context (Philpott et al. 2011)

To this end, however, there have been a number of studies which recognised the potential explanatory power of the institutional perspective in the context of academic entrepreneurship. Bjerregard (2010) identifies fifteen studies which revolve around an institutional analysis taking a primarily macro level perspective in contrast, it is asserted, to a growing move in the institutional research agenda towards understanding how institutional logics are carried into micro level interactions by human actors. Such a move in the context of the third mission literature is cited by Bercovitz and Feldman (2008) as a significant and necessary step in the development of the literature. As suggested by Philpott et al. (2011), the high profile commercialisation successes of a relatively small number of universities has led to an entrepreneurial mythology from which a premature focus on hard commercialisation activities and the attendant hard structures has been drawn, at the expense of a deeper analysis of local institutional processes. It is proposed that this study shall seek to address this deficit and shall in so doing provide unique insights into the process through which the institutional context shapes the orientation of faculty towards engagement with the third mission.

8. An Institutional Perspective on Barriers to Academic Entrepreneurship

Numerous examples of potential barriers to academic entrepreneurship are identified within the literature, and these provide a useful starting point for focusing the investigation. The perceived barriers exist at an institutional, and consequently at an individual and operational level, ranging from basic constraints on resources and expertise, to the ‘publish or perish’ culture inherent in academia (Cunningham and Harney 2006). As alluded to earlier, the failure to align macro level objectives and micro level reality establishes a contradictory goal set for the individual researcher, wherein a goal established at, and driven from the macro level is in reality potentially detrimental to the individual’s personal outcomes. Similarly, the presence of appropriate incentives on a personal and career level within strategic initiatives is central to the cultivation of an institutional environment which optimises the return on commercialisation activities (D’este and Perkmann 2010). As Pant and Lachman (1998) suggest, the extent to which novel behavioural modes conflict with value based behavioural patterns at the micro level impacts significantly on their adoption probabilities. An institutional perspective provides us with the opportunity to demonstrate how academics interpretation of novel modes of behaviour is shaped by regulative, normative, and cultural-cognitive pressures which is critical to an overall understanding of their engagement with the commercialisation process (Oliver 1991).

In light of the discussion outlined, a distinct research agenda has emerged. A critical element of the overarching research topic is the significance of the extent to which research commercialisation as an activity is embedded within the value system of the institutional framework, and in particular the extent to which it is prioritised or legitimised in the form of reward mechanisms such as peer recognition, and career progression. As identified by Cunningham and Harney (2006), the impact of socio-cultural factors within the institutional framework is highly significant and is regularly cited by university scientists as a central element in the engagement with the commercialisation process. Similarly Dolfsma and Verburg (2008) emphasise the importance of the institutionalisation of behaviour as a valuable socio-cultural activity if it is to be replicated by individuals. Within this framework ‘values’ are addressed as socially shared cognitive representations of institutional goals and demands (Dolfsma and Verburg 2008).

As articulated in section 6, previous surveys of the entrepreneurial university literature have revealed a number of critical spheres of activity upon which the proliferation of commercialisation activity in a university context depends. Nelles and Vorley (2010) identify these key areas as structures, strategies, systems, culture, and leadership. Similarly Cunningham and Harney (2006) point to critical issues such as research culture, normative support, strategic missions, institutional leadership, and organisational structures as being significant indicators of deeper institutional commitment to the third mission as a whole. This assertion is echoed in Philpott et al.'s (2011) findings who argue that underlying tensions in the relationship between the traditional academic behavioural modes and those compatible with the third mission, revealed themselves in efforts to operationalise entrepreneurial initiatives at micro level and were articulated in terms of conflict with cultural norms, through conflict with interpretations of pre-existing strategy, and through perceptions of an absence of institutional leadership commitment.

These findings are in tune with what we would expect to find when there is an absence of congruence between projected behavioural modes and the prevailing logics which underpin institutional legitimacy in a particular context. Cunningham and Harney (2006), D'este and Patel (2007), and George and Bock (2009) further attest to the reluctance of human actors to engage with commercialisation activities when such incongruence reveals itself through inflexible attitudes to funding, working conditions, skills acquisition, or performance assessment in their environment. The provision of these elements, or lack thereof, within the relevant institutional context is likely to greatly impact on the propensity of researchers to engage with the process as a whole.

As such, the central spheres of activity outlined appear highly suitable as avenues of investigation in pursuit of the guiding research question. As focal points in the emergence of an entrepreneurial architecture, they serve as important indicators of the underlying institutional commitment to the third mission. Similarly, they serve as important indicators to the individual academic with respect to the legitimacy of commercialisation behaviour, and as such represent series of cues for action which can be extracted as signifiers of desired preferences and ends (Mills et al. 2010).

These themes provide a basis for the pursuance of the research question as identified in section 1. The paper will now outline a methodological framework for conducting the proposed study.

9. Methodological Approach

This section will outline considerations relating to the research methodology which will be employed in pursuit of the central research question. A brief outline of the philosophical and methodological alternatives will be provided, as well as a proposed research design.

Unit of Analysis

The unit of analysis in this study is the Principal Investigator (PI). As proposed by the national Strategy for Science, Technology and Innovation (SSTI), Principal Investigators have a central role in the delivery of an internationally competitive research base, and as such, they are recognised as playing a critical role in the development of the National Innovation System. Therefore, the propensity of PIs to engage with the process of research commercialisation is at the very core of the development of the ‘third mission’, and as such is a crucial element in the wider context of national economic development. A sample of multi-disciplinary composition is deemed central to capturing a representative picture of the institutional context within which commercialisation of research is expected to occur.

Philosophical Alternatives for the Social Sciences

As Burrell and Morgan (1979) suggest, there are four main philosophical debates which dominate research in the social sciences, namely the ontological debate, the epistemological debate, the human nature debate, and the methodological debate. Out of these debates, two major philosophical traditions have arisen, the subjectivist approach to social science and the objectivist approach to social science. Figure 1 below offers a continuum which highlights the major distinctions between the two.

	Subjectivist Approaches to Social Science			Objectivist Approaches to Social Science		
Core Ontological Assumptions (Reality)	Reality as a projection of human imagination Nominalism	Reality as a social construction	Reality as a realm of symbolic discourse	Reality as a contextual field of information	Reality as a concrete process	Reality as a concrete structure Realism
Basic Epistemological Stance (Knowledge)	To obtain phenomenological insight, revelation Anti-positivism	To understand how social reality is created	To understand patterns of symbolic discourse	To map contexts	To study systems, process, change	To construct a positivist science Positivism
Assumptions About Human Nature	Man as pure spirit, consciousness, being Voluntarism	Man as a social constructor; the symbol creator	Man as an actor; the symbol user	Man as an information processor	Man as an adaptor	Man as a responder Determinism

Figure 1

Source: Holden and Lynch (2004) adapted from Morgan and Smircich (1980)

Given the explorative nature of the proposed study and the phenomenological nature of neoinstitutionalism in particular, it is suggested that reflecting these issues in the choice of methodology must centre on capturing insiders perceptions of events. As Schultz et al. (2000) propose, understanding how larger forces influences behavioural processes is about tapping into the rich data of individuals experiences, as much as it is about labeling with accuracy.. Greenwood (2002, pp. 128-129) suggests that an inherent strength of the subjective approach lies in the fact that it “mobilizes relevant knowledge from people in a position to know their condition far better than conventional research can do with its extractive approach” (Shotter 2003)

Major Alternatives in Research Methodology

The two major methodological alternatives for research in the social sciences are the quantitative approach, characterised by its focus on the quantification and standardised measurement of data; and the qualitative approach, which is concerned with the collection and analysis of data that is much more difficult to quantify, and as such, places emphasis the interpretation of the world by its participants. In the light of the above discussion then, it is

proposed that given the subjective nature of the topic under investigation, qualitative research offers much greater potential for the collection of rich, insightful data, which will generate a much greater understanding of the phenomenon under investigation. Gillham (2000, p.11) states that a qualitative approach enables the researcher to explore phenomena that are beyond the reach of more controlled methods, allowing the researcher to understand the “informal reality” of the internal workings of the organisation (Ross 2006).

Therefore, it is proposed that qualitative semi-structured interviews are employed in pursuit of the research question. Semi-structured interviews involve using an interview guide, which contains a list of fairly specific topics to be covered but gives a great deal of leeway to the interviewee with respect to how they respond. In particular, there is a much greater emphasis on the interviewee's point of view as this holds the greatest promise for generating insight into the phenomenon (Bryman and Bell 2007). Given the need to generate deep insight into the phenomenon under investigation, semi-structured interviews are a highly appropriate research method for this study.

Conclusion

This paper has sought to articulate a theoretical position which establishes a research agenda for the exploration of the micro-processes through which institutional pressures impact upon the behaviour of academics with respect to the perceptions of the feasibility and appropriateness of commercialisation activity. It has been asserted that an examination of the process through which academic researchers interpret and make sense of cues for action in their environment poses significant potential for the generation of fresh and unique insight into the micro-foundations of the entrepreneurial university and academic entrepreneurship as a whole.

In so doing the authors have outlined both the emergence of the entrepreneurial university, and the nature of academic entrepreneurship as a mode of behaviour. Additionally, the theoretical underpinnings of key constructs such as institutional logics, legitimacy, and sensemaking have been addressed, as well as the implications they hold as a combined theoretical lens for the analysis of commercialisation activity in university faculties. As such,

the paper has provided a conceptual basis for the employment of an institutional analysis to the phenomenon of academic entrepreneurship, and in so doing has demonstrated the potential for an institutional perspective to inform existing perceptions of the academic entrepreneurship phenomenon.

References

Benner, M., and Sandstrom, U. (2000) Institutionalizing the triple helix: research funding and norms in the academic system, *Research Policy*, Vol. 29 (2), pp. 291-301

Bercovitz, J., and Feldman, M. (2003) Technology Transfer and the Academic Department: Who Participates and Why?, *DRUID Summer Conference* (Copenhagen)

Berman, E.P. (2008) Why Did Universities Start Patenting? Institution-Building and the Road to the Bayh-Dole Act, *Social Studies of Science*, Vol 38 (6), pp. 835-871

Bjerregaard, T. (2010) Industry and academia in convergence: Micro-institutional dimensions of R&D collaboration, *Technovation*, Vol 30 (2), pp. 100-108

Boardman, P.C., and Ponomariov, B.L. (2009) University researchers working with private companies, *Technovation*, Vol 29 (1), pp. 142-153

Brennan, M., McGovern, P., and McGowan, P. (2007) Academic Entrepreneurship on the Island of Ireland: Re-Orientating Academia Within the Knowledge Economy, *The Irish Journal of management*, (1), pp. 51-57

Bryman, A., and Bell, E. (2007), *Business Research Methods*, Oxford University Press, New York

Burrell, G., and Morgan, G. (1979), Two Dimensions, Four Paradigms, *Sociological Paradigms and Organizational Analysis*, Ashgate Publishing Company, Vermont, USA, ch.3, pp. 21-40

Callinicos, A., (2006) *Universities in a Neoliberal World*, Bookmarks Publications, London

Colyvas, J.A., and Powell, W.W. (2006) Roads to Institutionalization: The Remaking of Boundaries between Public and Private Science, *Research in Organizational Behavior*, Vol 27, pp. 315-363

Crouch, C., and Farrell, H. (2004) Breaking the Path of Institutional Development? Alternatives to the New Determinism, *Rationality and Society*, Vol. 16 (1), pp. 5-43

Cunningham, J., and Harney, B. (2006) *Strategic Management of Technology Transfer: The New Challenge on Campus*, Oak Tree Press

Dacin, T. (1997) Isomorphism In Context: The Power and Prescription of Institutional Norms, *Academy of Management Journal*, Vol 40 (1), pp. 46-81

Deephouse, D. L., and Suchman, M. C. (2008) Legitimacy in Organizational Institutionalism, *The SAGE Handbook of Organizational Institutionalism*, pp. 49-77, Thousand Oaks CA, Sage.

D'este, P., and Patel, P. (2007) University-Industry Linkages in the UK: What are the Factors Underlying the Variety of Interactions with Industry?, *Research Policy*, Vol 36 (9), pp. 1295-1313

D'este, P., and Perkmann, M. (2010) Why do academics engage with industry? The entrepreneurial university and individual motivations, *Journal of Technology Transfer*, Forthcoming.

Dillard, J. F., Rigsby, J.T., and Goodman, C. (2004) The making and remaking of organization context: Duality and the institutionalization process, *Accounting, Auditing & Accountability Journal*, Vol 17 (4), pp. 506-542

Etzkowitz, H., & Leydesdorff, L. (1997) *Universities and the Global Knowledge Economy: A Triple Helix of University-Industry-Government Relations*, Pinter, London

Etzkowitz, H., and Leydesdorff, L. (1999) The Future Location of Research and Technology Transfer, *Journal of Technology Transfer*, Vol 24 (2), pp. 111-123

Etzkowitz, H., Webster, A., Gebhardt, C., and Terra, B.R.C (2000) The future of the university and the university of the future: evolution of ivory tower to entrepreneurial paradigm, *Research Policy*, Vol 29, pp. 313-330

Garrett-Jones, S., Turpin, T., Burns, P., and Diment, K. (2005) Common purpose and divided loyalties: the risks and rewards of cross-sector collaboration for academic and government researchers, *R&D Management*, Vol 35 (5), 535-544

Gassol, J.H., (2007) The effect of university culture and stakeholders' perceptions on university-business linking activities, *Journal of Technology Transfer*, Vol 32 (1), pp. 489-506

George, G., and Bock, A.J. (2009) *Inventing Entrepreneurs – Technology Innovators and Their Entrepreneurial Journey*, Pearson Prentice Hall, New Jersey

Gillham, B. (2000), *Case Study Research Methods*, Continuum, London

Glenna, L.L., Lacy W.B., Welsh, R., and Biscotti, D. (2007) University Administrators, Agricultural Biotechnology, and Academic Capitalism: Defining the Public Good to Promote University-Industry Relationships, *The Sociological Quarterly*, Vol 48, pp. 141-163

Hanson, M. (2001) Institutional Theory and Educational Change, *Educational Administration Quarterly*, Vol 37 (5), pp. 637-661

Henrekson, M. and N. Rosenberg (2001) Designing Efficient Institutions for Science-Based Entrepreneurship: Lesson from the US and Sweden, *Journal of Technology Transfer*, 26 (3), 207-231

Holden, M.T., and Lynch, P. (2004) Choosing The Appropriate Methodology: Understanding Research Philosophy, *The Marketing Review*, Vol. 4 (4), pp. 397-409

Holm, P. (1995) The Dynamics of Institutionalization: Transformation Processes in Norwegian Fisheries, *Administrative Science Quarterly*, Vol. 40 (3), pp. 398–422

Ikenberry, G.J. (1994) History's Heavy Hand: Institutions and the Politics of the State, Presented at conference on The New Institutionalism, University of Maryland, October 14-15, 1994

Jain, S., George, G., and Maltarich, M. (2009) Academics or entrepreneurs? Investigating role identity modification of university scientists involved in commercialization activity, *Research Policy*, Vol. 38, p.922–935

Jensen, T.B., Kjærgaard, A., and Svejvig, P. (2009) Using institutional theory with sensemaking theory: a case study of information system implementation in healthcare, *Journal of Information Technology*, Vol. 24, pp. 343-353

Kenney, M. and W. R. Goe (2004) The Role of Social Embeddedness in Professorial Entrepreneurship: A Comparison of Electrical Engineering and Computer Science at UC Berkeley and Stanford, *Research Policy*, Vol. 33 (5), 691-707

Klofsten, M., and Jones-Evans, D. (2000) Comparing Academic Entrepreneurship in Europe – The Case of Sweden and Ireland, *Small Business Economics*, Vol 14, pp.299-309

Krucken, G. (2003) Learning the 'New, New Thing': On the role of path dependency in university structures, *Higher Education*, Vol. 46 (3), pp. 315-339

March, J.G., and Olsen, J.P. (1995) *Democratic Governance*, Free Press, New York

Meyer, J.W., and Rowan, B. (1977) Institutionalised Organisations: Formal Structure as Myth and Ceremony, *American Journal of Sociology*, Vol 83 (2), pp. 340-363

Oliver, C. (1991) Strategic Responses to Institutional Processes, *Academy of Management Review*, Vol 16 (1), pp. 145-179

Pant, P.N., and Lachman, R. (1998) Value Incongruity and Strategic Choice, *Journal of Management Studies*, Vol 35 (2), pp. 195-212

Patzelt, H., and Shepherd, D.A. (2009) Strategic entrepreneurship at universities: Academic entrepreneurs' assessment of policy programs, *Entrepreneurship: Theory and Practice*, Vol 33 (1), pp. 319-340

Peters, B.G., and Pierre, J (1998) Institutions and Time; Problems of Conceptualisation and Explanation, *Journal of Public Administration Research and Theory*, Vol 8, pp. 565-584

Philpott, K., Dooley, L., O'Reilly, C., and Lupton, G. (2011) The entrepreneurial university: Examining the underlying academic tensions, *Technovation*, Forthcoming.

Reay, T., and Hinings, C.R. (2009) Managing the rivalry of competing institutional logics, *Organization Studies*, Vol 30 (6), pp. 629-652.

Rosell, C., and Agrawal, A. (2009) Have university knowledge flows narrowed? Evidence from patent data, *Research Policy*, Vol 38, pp. 1-13

Ross, P. (2006) Management strategies I transitional economies: Organisational restructuring and employment relations at Cesky Telecom, *Employee Relations*, Vol. 28 (2), pp. 184-200

Schultz, M., Hatch, M.J., and Larsen, M.H. (2000) Scaling the Tower of Babel: Relational Differences between Identity, Image, and Culture in Organisations, *The Expressive Organization*, ch.2, pp. 9-35

Scott, W.R. (1995) *Institutions and Organizations*, Sage, Thousand Oaks, California

Shotter, J. (2003) Wittgenstein's philosophy and action research, *Concepts and Transformation*, Vol. 8 (3), pp. 295 – 301

Siegel, D., Waldman, D. and Link, A. (2003) Assessing the Impact of Organisational Practices on the productivity of university technology transfer offices: An exploratory study, *Research Policy*, Vol 32, pp. 27-48

Suchman, M.C. (1995) Managing legitimacy: strategic and institutional approaches, *Academy of Management Review*, Vol. 20 (3) pp.571-610

Suddaby, R. (2010) Challenges for Institutional Theory, *Journal of Management Inquiry*, Vol. 19 (1), pp. 14-20

Thornton, P.H, and Ocasio, W. (2008) Institutional Logics, *The SAGE Handbook of Organizational Institutionalism*, pp. 99-129, Thousand Oaks CA, Sage.

Townley, B. (1997) The Institutional Logic of Performance Appraisal, *Organisation Studies*, Vol. 18 (2), pp. 261-285

Townley, B. (2002) The Role of Competing Rationalities in Institutional Change, *The Academy of Management Journal*, Vol. 45 (1), pp. 163-179

Tyler, T.R. (2006) Psychological Perspectives on Legitimacy and Legitimation, *Annual Review of Psychology*, Vol. 57 (1), pp. 375-400

Vorley, T., and Nelles, J. (2010) Constructing an Entrepreneurial Architecture: An Emergent Framework for Studying the Contemporary University beyond the Entrepreneurial Turn, *Innovative Higher Education*, Vol. 35, pp. 161-176

Weatherford, M.S., (1991) Mapping the Ties that Bind: Legitimacy, Representation and Alienation, *Western Political Quarterly*, Vol. 44 (2), pp. 251-276.

Weick, K.E. (1995), *Sensemaking in Organizations*, London, Sage.

Wezel, F.C., Saka-Helmhout, A. (2005) Antecedents and consequences of organizational change: institutionalizing the behavioral theory of the firm, *Organization Studies*, Vol. 27 (2) pp.265-286

Wright, M., Piva, E., Mosey, S., and Lockett, A. (2009) Business Schools and Academic Entrepreneurship, *Journal of Technology Transfer*, Vol.34, pp. 560-587

