Managing Accountability Expectations Using Structural and Communicative Mechanisms: A New Institutional Perspective.

Abstract
Commercialisation of research has now become widely accepted as a desirable activity for many universities across the globe. As universities step up their commercialisation efforts, risks of competing accountability and legitimacy claims arise due to greater diversity in roles, missions, funding sources and a high exposure to market pressures. A variety of institutional pressures emanating from the wider social environment is also causing a notable shift towards institutional entrepreneurship requiring professional autonomy and commitment. This change in accountability relationships of universities is posing a new challenge to the New Public Management (NPM) model of public sector accountability. While these challenges have been acknowledged in literature, there has been limited examination in recent years in a higher education context regarding how these challenges are being met. Using an exploratory case study and drawing on the new institutional theory, this study investigates how universities manage dialectical accountability expectations to enable commercialisation of their research activities. The findings of the study reveal that universities employ varying forms of structural configurations and communicative strategies as key accountability mechanisms to seek legitimacy, gain valuable resources and enhance their reputation as useful players involved in commercialisation of research. The structures serve as both bridging mechanisms to facilitate collaboration of research as well as a buffer for researchers to exercise professional autonomy. The communicative narratives indicate that legitimization rather than measurement of commercialisation results is important

Key words: Accountability, Commercialisation, Legitimacy, New Public Management.

1. Introduction

The central research question which this paper aims to address is: how universities manage diverse accountability expectations of multiple stakeholders to enhance commercialisation of research. Two key accountability mechanisms used to manage accountability expectations will be studied: structural configurations and communicative strategies; and what factors influence the existence of these mechanisms?

The complexity of the public sector has also long been recognised through the existence and importance of a wider set of stakeholders (Brignall & Modell, 2000) whose involvement has led to "inevitable tensions and dysfunctionalities" (Glynn & Perkins, 1997, p. 129). As an organisation seeks to respond to multiple accountability demands, there is a danger that it may suffer from "multiple accountability disorder" (Koppell, 2005). The university sector is at risk as managing one set of accountability expectations can potentially compromise the universities ability to manage another set of expectations of a different stakeholder. According to Subramanian, Insley, & Blackwell (1993, p. 157), "accountability tools are not neutral technical instruments but discursive technologies embodying their own logics and interpretive schemes, and can have constitutive and transformative effects." As there are only so many ways an

organisation can be transformed at once, something has to give. University accountability relationships are not linear but dialectical as those engaged in research and commercialisation activities are dependent on one another to provide resources, build research capability, provide autonomy, manage and protect IP, etc. and compliance cannot be assumed. Linear accountability is based on command and control mechanisms. Universities operate in a wider institutional environment comprising local, national, international stakeholders which poses a problem of "many hands"(Bovens, 2007) and attempts at constructing neat solutions based on systems of extended accountability (C. Scott, 2000) and network accountability (Harlow & Rawlings, 2007) does not fully address what roles the objects of accountability demands play in shaping those demands (Subramanian, Insley, & Blackwell, 1993). Managing accountability expectations is crucial in transforming university research into commercial outputs with the co-operation of multiple and often competing stakeholders. Hence, a much deeper understanding of what it means to be accountable is required.

Increasing expectation for commercialisation is adding a new dimension to university research management practices which is in conflict and causing tensions with the NPM model of accountability. Research management within universities are largely dictated by a culture of managerialism and performativity originating from the New Public Management[1] (NPM) literature (Brignall & Modell, 2000; Codd, 2005; Coy & Pratt, 1998; Ezzamel & Willmott, 1993; Gray, Guthrie, & Parker, 2002; Lapsley & Miller, 2004; Neumann & Guthrie, 2002; Parker, Guthrie, & Gray, 1998; Tushman & Anderson, 1986). The NPM model of accountability places high value on what is produced, observed, and measured. For knowledge, experience, and innovation to be valued and recognised, it needs to be reduced to some measurable performance outcomes under NPM (Codd, 2005). The managerialist accountability is largely audit driven (bureaucratic accountability) and has been at odds with professional groupings who prefer greater autonomy, flexibility, and a culture of trust to produce successful outcomes (Codd, 2005; O'Neill, 2002). The tension between academic innovation and NPM audit driven accountability has been recognised in literature (Findlow, 2008) and is counter productive to commercialisation. Therefore accountability relationships need careful management as it will shape the organisation response to select and use appropriate mechanisms to enhance commercialisation. Research on organisational response to accountability and performance mechanisms introduced under NPM show that conflicting pressures on the organisation lead to the adoption of a range of responses, from transformation, acquiescence, defiance, and manipulation (Brignall & Modell, 2000). But scope for strategic action may be bounded and structured by their institutional environment. Noteworthy evidence from empirical studies regarding research management within the private sector suggests that formal and programmed management control mechanisms are largely ineffective in managing the ambiguous nature of research (Abernethy & Brownell, 1997; Bisbe & Otley, 2004; Davilla, 2000; Ditillo, 2004). These studies also find that given contrasting research characteristics, alternate management control (accountability) mechanisms have varying degrees of success in managing research outcomes. While these studies offer useful insights into management control systems, they do not specifically address accountability issues. They also fail to recognise the interactive and complementary nature of different

[1] New Public Management (NPM) refers to the conception of public accountability characterised by and the adoption of private sector management techniques and competitive attitudes with a greater emphasis on measurable outputs (Hood, 1991)

control mechanisms (Abernethy & Chua, 1996; Alvesson & Karreman, 2004; Macintosh & Daft, 1987; Simons, 1995).

There has been previous research on the university sector using institutional frameworks attributing organisational change to wider political, social and economic pressures (Brignall & Modell, 2000; Coy & Pratt, 1998; Deem, 2001; Ezzamel & Willmott, 1993; Gray, Guthrie, & Parker, 2002; Lapsley & Miller, 2004; Neumann & Guthrie, 2002; Parker, Guthrie, & Gray, 1998). However the focus of many of these studies have been on the NPM transformation of the university sector at the macro level (Brignall & Modell, 2000; Juniper, 2002). These studies do not provide insights into specific use of accountability mechanisms at the micro-level. By conducting an exploratory case study of two universities actively involved in research commercialisation, this study aims to contribute to a more comprehensive understanding of how accountability expectations are managed to enable research commercialisation. In particular, using new institutional theory, the study attempts to explain the motivations behind the use of structural and communicative strategies as key accountability mechanisms. In extending upon the contributing literature, this study will be of interest to policy makers, regulators, funding agencies, and universities themselves as they examine the most appropriate manner in which to discharge the accountability obligations to a wide group of stakeholder interests to enhance (not disrupt) research commercialisation at universities.

2. Literature Review

Accountability in higher education "is the most advocated and least analyzed word" according to Burke (2005, p. 1). Accountability is not just giving account or providing a comprehensive understanding of informing, explaining and justifying one's actions (Bovens, 2007) but what does it imply for the person giving the explanation. Therefore it is important to understand the dynamics of the accountability relationships that universities have to endure to achieve their commercialisation goals. The key to understanding the dynamics of accountability relationships lies in three key elements: the role of the institutional environment in shaping commercialisation; the adoption of organisational configurations; and the use of communicative strategies.

The institutional environment

Universities operate within an institutional environment. The institutional environment is characterized by rules and requirements to which individual organizations must conform in order to receive support and legitimacy (W. R. Scott & Meyer, 1991, p. 123). The institutional environment has a pervasive influence in affecting every organisational actor and structural feature (W. R. Scott, 2003, p. 23). Successful organizations become isomorphic with these environments and conform to their beliefs and contemporary norms in order to gain legitimacy, secure resources, and receive public support and confidence (J. W. Meyer & Rowan, 1977, p. 352). Meyer & Rowan (1977) argue that the prevalence of organizational forms can be attributed to the existence of "rationalized myths" or shared belief systems and these institutional belief systems powerfully shape organizational forms. Organisations will be subject to both technical and institutional pressures and these should be treated as dimensions along which environments vary rather than as dichotomous states with

one set precluding the other (W. R. Scott & Meyer, 1991, p. 168). The literature on organisation change is littered with many theories that suggest that organisations change for numerous reasons. For example, the dynamics that precipitate change may arise from exogenous institutional environment pressures such as 'destabilizing jolts' in the form of social and political upheaval, technology change, competitive market pressures, or regulatory change (Greenwood & Hinings, 2006; Lounsbury, 1999; A. D. Meyer, 1982; A. D. Meyer, Brooks, & Goes, 1990). The institutional environment is a construction of the macro actors and it has a major effect on every organisational actor and the organisation itself (W. R. Scott, 2003, p. 23). Therefore, organisation change can also arise from internal pressures or endogenous sources relating to changing values, conflicting internal interests, and increasing social fragmentation (Covaleski & Dirsmith, 1988a; Greenwood & Hinings, 1996; Oliver, 1992). Alternatively, change could also result from the actions of actors who have the power to alter the organisational goals by encouraging local entrepreneurship and changing the intellectual climate by introducing new ideas (DiMaggio, 1988; Fligstein, 1991; Leblebici, Salancik, Copay, & King, 1991). The institutional environment requires conformity and convergence among organisations so they can achieve homogeneity and legitimacy thus providing inertia and stability and dispel forces of change.

Structural configurations

Universities like other public sector organizations not only operate in a complex institutional environment; they are complex institutions per se, particularly in relation to its interactions with multiple stakeholders – government, oversight and funding agencies, industry organizations, communities it serves, staff, students, etc. (Codd, 2005; Lapsley, 2008). Organisations do not choose new structures at random (Jones, 1992). Organisation studies indicate a number of factors influencing this decision – size, strategy, pressures for conformity with institutionalised norms, values, beliefs, and technical lore institutionalised in society. In a study of educational organisations, Rowan (1992) found that education organisations add structures due to pressure of conformity and therefore get support and endorsement of key agencies in the institutional environment. DiMaggio & Powell (1983) found that organisations look similar because they have to conform to norms, beliefs, and rules in the institutional environment in order to achieve legitimacy, which enables them to acquire resources and improve chances of survival. They have argued that the homogenizing pressure from the state and professions lead to coercive, normative, and mimetic processes that causes organisations to adopt similar structural characteristics. The organisations response to change is also a function of internal dynamics (Greenwood & Hinings, 1996). Greenwood, Suddaby, & Hinings (2002) present a process model of institutional change suggesting that organisations response varies and will be influenced by strategic and organisational conditions.

Some common organisational adaptation techniques include employing buffering and bridging mechanisms and making changes in the core technology of organisations (W. R. Scott, 2003). Buffering techniques could include symbolic coding and decoupling to seal off the technical core from environmental pressures. Bridging techniques include bargaining, contracting, forming joint ventures, mergers, associations, and government links to secure legitimacy and support from the institutional environment while at the same time protecting their technical environment.

Communicative mechanisms

In rendering account, there needs to be an appreciation of the communicative structures in which accountability occurs (Subramanian, Insley, & Blackwell, 1993). Communicative mechanisms provide narratives of past events, actions, and performance that needs to be constructed to give account. Within the university sector some of the most common communicative mechanisms include university profiles, strategic plans, annual reports, research reports, newsletters, and web-site based information. According to Black (1993), the narrative constructed may have no effect on the organisation; may not be constitutive of organisational norms or practices; or it may be false in order to serve the organisations own interests to enhance the organisations legitimacy. When the narratives are rationally constructed to enhance the organisations legitimacy, communicative mechanisms simply serve as strategic devices to manipulate the perceptions of the organisations activities and performance (Subramanian, Insley, & Blackwell, 1993). The organisation may alter the narrative if it does not make sense to itself, or alternatively, it may seek to decouple the activities requiring maintenance of formal legitimacy structures (J. W. Meyer & Rowan, 1977). There is also a distinct possibility that the narrative alters the organisation and the potentially transformative effects of accounting and audit practices within organisations is a testimony to this claim (Subramanian, Insley, & Blackwell, 1993). The transformative effect of the accountability relationship has significant implications regarding whether organisations can construct multiple narratives to satisfy multiple accountability relationships in order to meet divergent legitimacy claims of multiple stakeholders. Therefore recognising the communicative dimension of accountability is important because it dismisses the image of accountability as an abstract, technical process, or tools and techniques that can be tweaked or manipulated and deployed at will to ensure that appropriate norms and outcomes are achieved. Rather it is an interpretive and discursive schema with its own logic in which participants make sense of each others role (Subramanian, Insley, & Blackwell, 1993).

3. Theoretical Framework

New institutional theory (NIS) will be used to interpret the findings of the two case studies. Drawing on from the contributions from the institutional theory, NIS refers to the study of organizational practices through its economic and sociological variants. According to Scott, institutions are composed of cultural-cognitive, normative, and regulative elements that, together with associated activities and resources, provide stability and meaning to social life (W. R. Scott, 2001, p. 48). New institutional theory recognises the importance of the organisation-environment linkages. It characterises the institutional environment as the elaboration of institutionalised beliefs, rules, myths, norms, and procedures to which organisations must conform to if they are to receive the support, acquire the needed resources, and gain legitimacy. Organizations which operate in similar environments are subject to institutional pressures of conformity and will have similar structures and processes (DiMaggio & Powell, 1991). According to Meyer and Rowan (1977, p. 343) the elements of formal organization structure are manifestations of powerful institutional rules which function as highly rationalized myths that are binding on particular organizations. DiMaggio and Powell (1983), consistent with Meyer & Rowan's views, argued that

similarity in organizations has arisen not because of competition or an objective requirement for efficiency but as a result of organizations strive for greater legitimacy within their larger environments. They argue that organizations have become increasingly similar to one another because the state and professions required such homogenization. Therefore, over time, in response to institutional pressures, organizations increasingly resemble one another within the same organizational field through a process of isomorphism. (DiMaggio & Powell, 1983) identified three types of institutional isomorphism that changes organizations: coercive, mimetic, and normative. *Coercive isomorphism* results from formal and informal pressures exerted on organizations to comply with requirements of other dominant organizations upon which they are dependent. The pressure for organization change may be in the form of force, persuasion, or an invitation to join in collusion. It could also be the result of government mandate, or political and legal pressure to increase legitimacy. *Mimetic isomorphism* occurs when organizations tend to model themselves after similar organizations that they perceive to be more legitimate or successful"(DiMaggio & Powell, 1983, p. 152). Organizations may model or adopt technologies or innovations from similar successful organizations to enhance their own legitimacy. *Normative isomorphism* occurs via professionalization mainly arising through the growth of professional networks that helps to channel organization behaviors and procedures in appropriate, expected, and legitimate directions.

In recent times, several new perspectives have emerged in the new institutionalism. Along with understanding the process through which institutions have a profound effect on shaping organization behavior, the research focus has shifted to examining the effects of individual and organizational action on institutions which causes normative fragmentation (Jepperson & Meyer, 1991; Oliver, 1992). Normative fragmentation would arise from changes in the composition of the workforce, changes in portfolio of activities, and changes in specialisations within organisations (Greenwood & Hinings, 1996). Fligstein (1991, p. 313) found that change in organisations occur when it is in the interest of those in power to alter the organization's goals. DiMaggio (1988) referred these individuals as institutional entrepreneur. Institutional entrepreneurs are individuals and groups who have an interest in transforming the normative, cognitive, and regulative aspects of institutions. They organize their activities around a "project" that requires alternative arrangements and strategy within the context of existing institutional constraints.

On the other hand organisations have been found to display varying degrees of choice, awareness, pro-activeness, influence, and self-interest in response to institutional pressures for change (Oliver, 1991). Some common methods include employing buffering and bridging mechanisms and making changes in the core technology of organisations (W. R. Scott, 2003). Buffering refers to organisations attempts to reduce external pressures by partially detaching or decoupling its activities from external contact (Oliver, 1991; W. R. Scott, 2003). Meyer and Rowan (1977) call this sagacious conformity, in which new technologies and techniques appear to be in use, but may not be acted upon.Decoupling sometimes becomes necessary as a means of maintaining faith and legitimacy of the organisation (J. W. Meyer & Rowan, 1977). Several studies support the notion of buffering tactics as a means of protecting the organisations interests, especially in terms of maintaining autonomy and maximising efficiency without having to depend on external intervention or open up to public scrutiny (Covaleski & Dirsmith, 1988a, , 1988b). Bridging techniques include

bargaining, contracting, forming joint ventures, mergers, associations, and government links to secure legitimacy and support from the institutional environment while at the same time protecting their technical environment.

4. Research Method

This paper uses an exploratory case study methodology to examine how universities manage accountability expectations related to research commercialisation. This approach is justified on the basis of the exploratory nature of the *how* research question posed and the desire to understand the contemporary phenomenon within a real-life context (Yin, 1994).To make the study more robust for the purpose of generating more compelling explanations, multiple case designs involving two separate cases have been chosen (Yin, 1994). Typical of most research universities, both institutions are actively involved in commercialisation of research. The first case, the Premier University (not the real name) [2] has probably the largest concentration of research activity in New Zealand and has been involved in the commercialisation of research for over twenty years. It has a separate commercial company considered to be the largest commercialisation company in Australasia. The university has a mission to be a research-led international university. The second case, Universal University (not real name) is a fast growing university that has placed a major emphasis on developing its research capability. In recent years it has made a major commitment to the development and commercialisation of its research and intellectual property. Universal University is new to commercialisation and its commercial company has been in operation only for the past five years. Both universities are domiciled in the Auckland region of New Zealand.

Both cases were purposefully selected using a strategy of theoretical sampling to provide information rich sources of data (Chua, 1995; Patton, 1990). There were two primary sources of data – archival and information gathered from semi-structured interviews of individuals from within and outside the universities. The archival data comprised of university charter, profiles, strategic plans, annual reports, newsletters and website information gathered by the researcher covering a time span of six years. In New Zealand, as a result of the 2003 Performance Based Research Fund (PBRF) assessment, research has been emphasised as a measure of the universities activities as well as investing in them. During this period commercialisation of research became widely accepted as an important objective for many universities and therefore using archival documents originating from this time is justified. It enables the study of ex-ante accountability mechanisms, instead of just relying on ex-post interviews that leave room for legitimating existing facts. Answering the research question calls for an in-depth investigation of factors influencing the use of accountability mechanisms. Hence there is merit in an in-depth analysis (Ahrens & Dent, 1998).

In order to gain rich data related to commercialisation of research, the study targeted research directors, researchers, senior academics, CEO's of commercial companies and spinoff companies, commercialisation managers, finance managers, policy makers, planning managers and other 'gatekeepers' within each university. Given the exploratory nature of the research, it became important to ensure that perceptions of

[2] The names of the two universities have been changed to maintain the anonymity of the interviewees.

accountability mechanisms were gathered from a variety of individuals who were posited differently within the research and commercialisation activities of the universities. In total 15 interviews were conducted.

The interviews were conducted in an open-ended and semi-structured manner to allow interviewees to focus on particular areas of experience and expertise (Silverman, 2005). A preliminary schedule of interview questions was prepared (see Appendix A) and adapted depending on the position and experience of the interviewee. Each interview lasted for between an hour and one and a half hours, and were recorded, transcribed and coded. These accounts were supplemented with information from the web sites, annual reports, and other public documents including the researchers' in-situ observations of the work environments and attendance at presentations. This information was then analysed in order to develop case descriptions (Yin, 1994) of each research area in terms of the stakeholders, stakeholder and university expectations, and structural and communicative strategies. These case descriptions were then compared and contrasted to identify potential commonalities and divergences. Data analysis was conducted in a way to allow the common patterns and themes to emerge in order to ensure that this adequately represents the observed cases (Miles & Hubermann, 1994; Patton, 1990). The findings from this analysis are presented in the following sections.

5. Results

The following sections describe the research commercialisation context of each case university, followed by a discussion of the accountability expectations of the key stakeholders. This is then followed by the use of structural configurations and communicative mechanisms to manage accountability expectations within each university.

Case 1: Premier University (PU)

PU is a long established, research-intensive, international university, domiciled in the Auckland region of New Zealand. It has one of the highest concentrations of top-ranked researchers in the country. Being considered as one of the largest research-led institution in NZ, the university is actively engaged in pioneering research across the spectrum of disciplines: Arts, Business and Economics, Creative Arts and Industries, Education, Engineering, Law, Medical and Health Sciences, and Science, expanding and enriching the country's knowledge base and directly contributing to social, economic and policy development. The University is a major provider of postgraduate education and is committed to a special role in the discovery and transmission of knowledge, and the development and commercialisation of its research and intellectual property. It is one of the earliest universities in New Zealand to engage in commercialisation and has one of the largest and most successful commercialisation companies in Australasia. The university owned commercial company protects and commercialises the university's intellectual property, runs its contract research and development activity, and supports an increasing number of commercially-focused specialist research and service centres at the University. Through the commercial company, the university also engages in research and development partnerships with a

wide range of local and global business organisations both in the private and public sector.

Stakeholder Expectations

Who are the stakeholders to whom accountability is due? What are their accountability expectations? Answers to some of these questions must be established before the accountability expectations could be managed.
Premier University is a very large and complex organisation recognised through the existence and importance placed on a wide range of stakeholders. It identifies its key stakeholders of research commercialisation as: external organisations, business, community, government, other educational and research institutes, industry, staff, students, and the international community. Key international stakeholders include some of the world renowned universities and its leading researchers. The international partner universities and researchers, including students are attracted to the Premier University because of its high international reputation and ranking in research. The international stakeholder expectations are that research has an international dimension requiring collaboration to make a significant contribution to the development of a global knowledge based society. Both universities have top ranked researchers and research facilities that enable this collaboration to take place. The accountability relationship here is clearly dialectical as both universities have expectations of each other to advance their research projects, enhance intellectual development, gain peer and professional recognition, and enable university staff and student exchanges, etc.

"I think if you look at beyond NZ and look at successful private universities, that's where there is the huge capability. If you have a look at Stanford and Harvard, they are way out there on the other side of the spectrum, and they have built up their endowments, their international reputation on the research they do, and their own capabilities. I think NZ is so small that we've got to look off-shore for those projects and those opportunities, and partner with international organisations." (Senior Manger P)

The university's expectations from international collaborations with top ranked partner universities are mainly to maintain a high reputation and ranking among the world's leading research universities. This also enables the university to secure resources and research funding not only from the partner universities but as well as the government. The annual reports of the university show that it has been very successful in this regard. International collaboration has also helped to create opportunities for the government and businesses to build on these relationships.

Similar themes continued and are summed up by Director M's comment that:

"I think the greater number of projects that get commercialised, your international reputation as a university grows, so that's the intangible that comes out of it. It is your research capability that stems from greater numbers of successful commercialisations. That then flows into attracting other top-flight academics, then that flows into, if you have got top-flight academics you are attracting top postgraduate students to do their own study and research. So, its one after the other, you grow your reputation."

Concerning stakeholder expectations related to external organisations, the university is engaged to advance their research needs. A range of contributions is also expected by the business community and industry in terms of research outcomes and industrial development. Some of these expectations arise from partnerships between university/business/industry.

"We have lots of examples where basic research has resulted in a continual stream of business opportunities, locally and internationally."(CEO P)

Discussion with senior university staff also made it fairly obvious that major corporations are looking more and more to universities as research partners as they outsource their research and development in favour of innovation using external sources of expertise.

"Large companies are effectively outsourcing research and development, in a race to secure the best expertise from universities. The university on the other hand is systematically seeking to identify opportunities for new, profitable, commercial activities." (CEO P)

The staff and student expectations are that the university will provide funding and support to build their research capability which could ultimately lead to commercial outcomes. For this to happen there is an expectation of an innovative and enterprising research culture to prevail with researchers given a great deal of professional autonomy to pursue their interests.

"It (commercialisation) provides a real interface for our staff and students between their research and training, and commercial outcomes, and interface with business."(CEO P)

On the university expectations, a comment made by Director C of the university commercial company was:

"The university are the key contributors to our operations because it is with them that we actually engage our clients".

Government as a stakeholder has an expectation of tangible returns on investments in research and are drawn to universities as drivers of knowledge economies. It is placing increased emphasis on commercial outcomes from research.

"There is a very broad expectation that research should have an economic outcome, and there is a sense that, or some questions by business and government that there is that relationship between the money spent on national research and commercial outcomes. I think it is recognised by some in government that you need to have a good vital research activity in your country if you want to participate in the knowledge economy." (Director P)

Managing Accountability Expectations using structural mechanisms

The university has a very complex structural configuration mainly arising from its size and complexity of research operations. To manage accountability expectation of its key stakeholders, the university, in its strategic plan (2005-2012), had undertaken to develop large-scale research institutes of excellence that will provide them with an appropriate operating environment and accountabilities; invest in selected institutes to ensure that they can achieve sustainability at the required scale in the shortest time possible; encourage co-operation between research institutes and faculties, so as to maximise mutual benefit and minimise internal competition; and ensure that institutes which fail to grow and perform to the required level are closed so as to release funding for other ventures. This implies that the structure is largely dependent on funding and the emphasis on research institutes and faculties attracting external research income is a measure of the success of its operations. Some examples of

successes reported in the university 2007 Annual report are as follows:

"The first of these successes has been the winning of a major FRST contract ($3.9m) …. The second success has been the winning of a Strategic Relocation grant ($8.8m)"

"Researchers in the faculty had a very successful year in winning new research grants; the total of new awards was $16.3 million."

"… the institute's major achievements for 2007 include new major research funding, new prestigious international collaborations, .. and increased public promotion of science and research outputs."

Funding success demonstrated by these centres is not only a measure of their success but also allows the university to assist in the development of staff and student research capability. The university has set aside a substantial staff research fund, a new fund to support the purchase of large items of research equipment, and another fund to support the research and associated costs of PhD students. Many of these schemes have been made possible only because of the university's success in obtaining research funding.

Currently the university has two large-scale research units and eight smaller, multi-disciplinary institutes, some of which are world renowned and focussed on pioneering research. It has more than 36 smaller research centres created to promote, support and conduct multi-disciplinary and collaborative research. Structurally, the research centres are a means to develop a broad but focussed research programme and create a sufficient critical mass for sustained quality researchers. The institute structure enables the university to increase its capacity and capability to undertake novel and leading-edge fundamental research. The university also houses four government-funded Centres of Research Excellence (CoREs) to promote academic inquiry into areas considered of national and international importance. These CoREs combine extensive national and international networks and complementary skills from the university research institutes and centres, partner universities, industry, and government research agencies to promote cutting edge research. A major portion of government funding for research is channelled to these CoREs and renewal of funding is performance based.

The university has a central research office to facilitate the overall management of the research affairs of the university with the Deputy Vice-Chancellor (Research) having overall responsibility and direct accountability to the Vice-Chancellor. The research office manages the accountability expectations of the university community by providing support and assistance in gaining research grants and in research grant management for both university-sponsored as well as external government and international grants. In addition to providing a 'one-stop shop' for research administration services, it facilitates development and implementation of the university's strategy to grow research revenues and enabling an environment across the university that encourages and supports excellence in research. Structure provides professional researchers with academic autonomy, enables pooling of the required resources to build research capacity and capability, and promotes a strong research culture.

"A vibrant research culture enables universities to attract better staff and students, and to build a culture of inquiry and academic rigour that enables them to contribute

more effectively to society in a rapidly changing world." (2007 Annual Report)
The University has a wholly-owned commercialisation company to facilitate research of a commercial nature, manage intellectual property, and provide consulting and technology transfer. As stated in the university Strategic Plan 2005-2012, it helps to:

"Make specialised expertise for commercialisation of intellectual property easily accessible by university staff and students and not unnecessarily duplicated within the organisation"

The commercial company structure has been created so that it provides a strong business focus - identify intellectual property, seek commercial outcomes, negotiates contracts, manage risk, make investments, finds markets, and bring value back to the university; something not possible under the university structure.

"..they (the university) set us up as a separate business unit so we could act as a commercial entity, and I mentioned earlier – de-politicise decisions. I can't emphasise that enough. It is very convenient sometimes to constrain behaviour according to other prerogatives that exist in the university. Definitely, we can move faster. That's absolutely true" (CEO P)

Communicative mechanisms

The university uses a wide range of communicative mechanisms to keep its stakeholders informed about its research and commercialisation initiatives. The university charter, the strategic plan, profile and investment plan are public documents that clearly lay out the intent and commitment to research and commercialisation. The university charter 2003 and strategic plans 2005-2012 both state: *The University is committed to: engaging with national and international scholars, educational and research institutions to enhance intellectual development, educational quality and research productivity and; the development and commercialisation of enterprise based on its research and creative works.* The university website contains extensive information on the research activities, research centres, and research institutes. The commercial company has a separate website with links to the university web pages. The websites provide details of the objectives, functions, membership, staff and student profiles, achievements, funding success, etc. Most of the information is largely publicity material but it does provide an extensive narrative of past events, activities, and performance. The university also produces faculty newsletters, research news, and a whole range of publicity and promotional materials to keep in touch with its stakeholders.

Since the annual report is widely regarded as the key accountability mechanism, it became the focus of this study. The contents of the annual reports of the past five years were reviewed to determine the nature and extent of reporting on commercialisation activities. An analysis was carried out on the narrative sections of the annual report to determine some common themes. Key themes were determined from word and paragraph counts. The semi-structures interviews helped explain the motivations behind the reporting. Over the past five years the university has consistently reported on research commercialisation, but only as brief narratives on the activities, events and revenue generated by the commercial company.

As commented by Director C:
"We write a report to highlight some of the major activities we have done that year. It is difficult for any particular reader to grasp the full width of our business ..so quite often we

just highlight some of the things that are engaging to the reader, most readers have got no interest in what we do…".

On decisions regarding what goes in the annual report and the purpose of reporting, Director M commented:
"Well, we decide on a theme for each year and then we extract stories out of each area that is usually seen as a cross-section of activities across the university. We produce this as a marketing document as well."

From an analysis of the annual reports, major themes of the narratives determined by the word frequency and paragraph counts are focussed on university efforts aimed at building a research culture; developing research capability; improving research quality; undertaking research collaboration; and securing funding. The university's effort on building its research culture is based on autonomy, achieving excellence, and creating an innovative and enterprising environment. Building a research capability is dependent on staff, students, programmes, support services including research infrastructure - centres, institutes, and other facilities. The university places high value on research quality through the recruitment of top ranking researchers which then attracts high quality postgraduate students. Research quality influences the ranking and reputation of the university. To be a research led international university, the university engages in collaborative research with international partner universities, industry, research institutes, and business. The university attracts substantial research funding through various external sources and measures its success by the size of its research revenue. Some quotes from the 2006 university annual report captures some of the major themes as follows:

"A strong research and innovation culture is a key requirement for any modern international university"

"The continuing rapid growth in research contracting and commercialisation activities with business and industry and the growing number of companies spun out from academia, clearly attest to the fact that university research capability is one of the key drivers of local and international innovation systems."

The university annual reports do not contain any specific details on objectives, key performance indicators, and achievements relating to commercialisation activities. The only reporting as described above is on narrative section of the annual report. Interviewees explained that the university annual reporting is based around the strategic objectives and key performance indicators that the government has negotiated with the university and provided funding for. This is set out in the university's investment plan. The Investment Plan is a rolling statement describing the University's plans and activities for the next three years. The Investment Plan under the Education Act 1989 is also the base document which the Tertiary Education Commission (TEC) must utilise to release general funding. Commercialisation activities are not funded by TEC and therefore the university is not obliged to report on these activities.

"The objectives will flow from the government approved profiles (now replaced by investment plans). It is really just collecting the information up around the particular KPI that we are choosing to report on." (Director M)

The commercial company of the university receives all funding from commercial activities and is responsible for reporting the results of its activities and financial performance to the university. The university only picks up the total income and expenditure and consolidates these figures in its annual report.

"If it goes through the (commercial company), it is reported through the (commercial company). If it is public good it is reported through the university. The annual report actually separates out 'university only' and the 'group'." Director M

While the university does not report on specific commercialisation activities, it requires the commercial company to provide more comprehensive reports to the university to avoid any accountability deficits.

" Connecting that with accountability, we have quite a high level of reporting around where we have spent our money, to allow the university to see that, buying patents or investing in further developments of an idea to take it to a commercial point". (Director C)

On reporting by the university commercial company, Director C explained:

"Setting up our strategic plan actually determines where we are actually most interested in reporting back to our stakeholders, which are in the first case, the university and their staff, and then following on from that their customers who are stakeholders, as well as the general public both here nationally in NZ and internationally. So we see the stakeholders' interests in information are heavily connected to our strategic plan, so we take the drivers for revenue, commercialisation, and inventions and for research, sales or education sales, as all being the critical measures that we look to report."

He went on further to explain:

"The board makes sure that the strategic plan of our organisation is aligned with the goals of the university. The strategic objective of the company is around increasing the research revenues, the educational training revenues and the commercialisation revenues in the university. We set the objectives for how much activity we are putting into the university, the number of staff we engage, the number of patents and licences that we have for our commercial IP, the number of new invention disclosures that we get through the university every year, so that we can actually measure our activity, and we set goals for those to actually achieve".

The commercial company also produces an annual report which is circulated widely to its clients. The annual report does not contain any financial information but narratives on events and activities.

"What we have always tried to do is provide a stakeholder report through our annual report, which allows the stakeholders to see what our activities are and what we were doing and how we are going about it, to make sure there is a very good view, and that report we put out 4,500 copies, a lot to the staff but also our customers, to our banks and to our international clients." (Director B)

The primary motivation behind reporting is largely aimed at projecting a positive image as well as providing a measure of confidence to clients in the research capability of staff. .

"That's a promotional document" (CEO P)

"We have really aimed to try to tell people as much as possible about commercial activities that we have been successful with, continuously lifting the reputation of the organisation, because reputation is important to our success because it build confidence with clients that we can deliver against our projects." (Director B)

Interviewees were concerned that performance measures are difficult to specify because of the long term nature of the projects, some of which are difficult to quantify and measure.

"Revenue is a simple one, actually I am a not for profit, all the money I produce goes to the university, in one form or another." (CEO P)

He went on further to explain that *"these are the measures that government funding agencies have put on universities, so you can't blame the universities for behaving like that, they are behaving the way they're trained."*

All eight universities in NZ have formed a group referred as UCONZ (University Commercialisation offices of NZ) and provide regular reports on their commercialisation activities to this forum. These reports are consolidated into a NZ report on commercialisation similar to other overseas bodies such as AUTUM in US.

"NZ sector performance is best undertaken by looking at the macro perspective" (Consultant J)

"We can say that there is a NZ measure of commercialisation and that's quite often used to illustrate to government that there is quite a lot of return on investment from the research in NZ universities."

Case 2 – Universal University (UU)

The Universal University a fast growing university located within the Auckland Region. It has about thirty schools organised into five major faculties offering a wide range of programmes in many disciplines. In the last seven years, UU has undergone considerable changes aimed at strengthening its research and postgraduate education. It has been positioning itself as a world class university. The university places major emphasis on fostering of research that is applicable to the external world as well as contributes to the social and economic advancement of New Zealand. It has a primary responsibility to meet the needs of its communities, professions, business and industry with a major focus for both independent and collaborative research. The university has been engaged in commercialisation activities for the past ten years. In recent years, it has made a major commitment to the development and commercialisation of its research and intellectual property. UU has its own commercialisation company that is actively engaged in the transfer of research and technology, consultancy services, technology licensing and spin-off creation.

Stakeholder Expectations

UU has placed great importance on its stakeholders to influence and guide the university's research activities leading to commercialisation. It has identified some of its key stakeholders as government and funding agencies, staff, students, industry, business, community and professional groups, and international partners.

" ..we serve a great big regional population, a national population and international community. And within that there are lots and lots of varying interest". (Director M)

The government, through the Ministry of Education and the Tertiary Education Commission (TEC), determines and maintains the policy and funding environment in which the university operates.

"We are a university that is very heavily dependent on government and student funding, and it would be really nice to have an alternative". (Director J)

"If you look at the university level, the FRST (government funding agency) is a very significant player, but really what we are looking at from that, to invoke research funding" (Faculty Administrator G)

The government's expectations are that the university will deliver the research outcomes for which funding was granted and this also lead to the university making a significant contribution to the development goals of the nation.

This view was expressed by a senior government tertiary education policy manager:

"..it sees the tertiary education system as a powerful driver of economic performance, both in the regional development sense, but also in terms of new knowledge, knowledge joined together in new ways relating to economic opportunity on which NZ can capitalise. We've got economic and social development goals."

Staff and students were identified as the most important internal stakeholders of the university. The staff and student have a very high expectation of the university to provide funding and support to build their research capability and capacity that would ultimately lead to commercial outcomes.

"The university has made an investment in me, and that's a personal obligation to repay that investment many, many, many fold." (Professor S)

Staff and students also have a very high expectation that the university will provide an innovative and enterprising research culture. These institutional entrepreneurs (researchers) require a great deal of professional autonomy to pursue their interests as evident from the following comments:

"The university is smart enough to know that a person like me will not stand up to interference. If you give me the field I will run it, and I will run it in a way that the university will get everything they want from it, they will get high profile, they get money, they get research outputs, if they let me run it. The moment people start interfering is the day that I disappear, and that's why I am at this university and not with any of the other universities. I will be able to attract a better quality of PhD student." (Professor S)

UU consults with external industry, community, and professional bodies to determine the needs of businesses and industry and collaborates with these stakeholders to deliver commercial outcomes that contribute effectively to the new knowledge economy. Business and industry expectations are good research that will lead to innovative solutions to their needs.

"The University has a longstanding research engagement with industry and the professions, and strong emphasis is placed upon the practical, social and economic utility of research undertaken at the University." (Investment Plan 2008-2010)

In the university investment plan, UU has specifically stated its intention to seek leading national and international researchers to support and lead the development of research. There is a high expectation that the collaborative research partnership will lead to commercial products.

Interviewees described the university's expectation as building on its reputation and profile as research and commercialisation is highly regarded in both academic and industry circles. There is a high expectation at UU that commercialisation will lead to development of research capacity at the University and provide an outlet for taking research to the next level.

Managing Accountability Expectations using structural mechanisms

Following a recent review of research performance, the university has placed a very high importance on the development of appropriate structures to manage accountability expectations in enabling research commercialisation.
The university has adopted an integrated model of commercialisation. It has a commercialisation office located within the university research office to facilitate commercialisation. It also has a separate commercialisation company headed by a CEO. Recently the university *"merged some of its administrative divisions supporting research and commercialisation to ensure that emphasis is not only on commercialisation but also on the contribution of commercialisation to the support and development of research capacity at the university" (Annual Report 2006).* It has established a technology park that houses university research groups, start-up companies in a business incubator, and several mentor and commercial companies. The university regards that this will provide a vibrant environment and an innovative approach to commercialisation.

The university's central research office has an important role in supporting the development of research at the university. Its major focus is on enhancing the research culture, growing capability and capacity in key research areas and promoting effective relationships between university researchers and external stakeholders that is mutually beneficial.

"The university is investing in structures which facilitate research, such as the research institutes and clusters, and it is providing staff with the opportunity and encouragement to conduct research". (Investment Plan 2008-2010)

Information from the university website indicates that UU currently has fifteen research institutes established and funded by the university to bring focus to research activity and foster a strong research-led culture that will lead to the development and

commercialisation of innovative products. These research institutes are hosted by the university faculties. Having research institutes ensures that resources are concentrated into the areas where the university has capability. The institutes are the key concentration of research activity, and within these institutes, centres of research activity are also developing. The Institutes and centres also have an important training role for postgraduate students. The largest research institute has stated its key objectives to encourage and foster cross-disciplinary collaborative research; act as a champion in the collection of funding from a variety of sources; and attract industry projects and funding. Another key research institute has its main objectives to establish internationally as a high profile research institute and attract significant research funds both in New Zealand and internationally. The following comments made by the Director of a large research institute reflect this.

"I have the accountability to the university to generate profile and funding for the university. I've got academic freedom." (Director C)

He went on to further explain that the research institute structure serves not only as an important mechanism to attract funding and build profile but it also helps bring together professionals through research collaborations, provides them with resources and much needed autonomy that helps build research capacity. *"Structure also helps build the critical mass and enhances the research culture".*

The university established a commercial company with the aim to strengthen research capability within the university; to facilitate the commercialisation of university research and development; and to provide practical support for entrepreneurial activity. It is housed within the technology park thus enabling a unique collaborate environment with established businesses. It also brings together, legal and business expertise not in universities.

As was commented by CEO K:
"The benefit is that the technology park will bring these technologies into the university and then we can apply some of our research capability to those companies, and so the university gets the opportunity for both staff and students to work with real live companies and their technologies, and because we have a professor and a couple of PhD students working with these companies, the opportunity for the companies is to take their technologies to new levels that they would not normally have the resources to do so".

Communicative mechanisms

The university charter, the strategic plan, profile and investment plan are formal communicative mechanisms that clearly lay out the intent and commitment to research and commercialisation. It also is largely aimed at building reputation and being recognised as is evident from information extracted from the university strategic Plan 2007-2011.
"Our reputation will be enhanced by the quality of the research undertaken by our staff and postgraduate students. There will be a self evident relationship between the University's research, consultancy and commercialisation. Our success in increasing research activity will result, inter alia, in a research rich environment for learning and teaching, an improved Performance Based Research Funding (PBRF) rating, increased consultancy contracts and more commercialisation of intellectual property. The University's reputation for research in key areas will lead to increased research collaborations, both nationally and internationally, and we will be the leading provider for doctoral students studying in these areas".

The university web page provides an extensive range of narratives about the activities and events relating to research and commercialisation. These web pages are also linked to separate web pages of the institutes and the research centres giving details relating to the mission, objectives, partnership arrangements, and key staff members with international affiliations, etc. It's mainly to build profile and help establish identity and to provide legitimacy. For example, one research group has put on its web site its vision as**:** *"Recognised world leading facilities, expertise and profile via a unique portfolio and network of multi-disciplinary Groups.*In addition to the website information the university and individual faculties also publish research newsletters, and information bulletins on research and commercialisation activities.

As was commented by a Research Institute Director:

"..the most value will come to the university in the form of profile, as in mentioning and being in the press and the media…" (Director S)

The annual report is widely regarded as the key accountability mechanism. For successive years since 2002 the university has dedicated a section of the annual report to provide a narrative on research and commercialisation activities. The narratives appear to be largely focussed on reporting success, funding and promotions aspects. Some examples from the 2007 annual report follow:

"Substantial progress has been made in building research capability at the university, with 2007 showing steady improvements in key areas of research performance, including research outputs and postgraduate enrolments and completions".

"The high rate of external research income in 2007 continues the trend of past five years".

"The university's research culture has continued to flourish. The research institutes have produced significant results in terms of research outputs, external research income, and postgraduate supervision, and three research institute directors were selected as finalists in Bayer Innovators Awards 2007"

Up until 2006, the university has set a specific performance measure to increase the commercialisation of research activity. Under this objective it had two key performance indicators on which it reported – to increase identifiable commercialisable pieces of intellectual property, and to graduate high growth companies from its technology park. However, in the 2007 annual report, this objective was dropped off. As was explained by Director J: *"…if it is not in the investment plan then we don't actually have to report on it in the annual report.."*

Director M who has a key role in planning explained as follows:

"Many reasons. I will be honest with you, this is my opinion, and some of it would be that the overall research capability became more important. I am not saying commercialisation isn't vital to that; we have got some other KPIs more about building our staff capability, building research capability overall. Maybe it is also because commercialisation at (university) is probably in its infancy, so there's sort of a bit of a mix of KPIs that stretch us and ones that we know we can achieve and be seen to be achieving on".

A review of the 2007 KPIs in the annual report confirmed this view. The only KPIs reported that vaguely related to this was as follows: percentage of students studying in higher education programmes; to increase masters and doctorate enrolments; and to increase external research revenue. However these indicators have been a standard reporting practice from the past and give no indication of the university's performance relating to commercialisation initiatives.

There was conflicting views on KPIs and how performance needs to be measured. An interesting and opposing view expressed by a researcher and Institute Director was:

"People tend to measure success in the wrong way. They measure success, particularly in my area, by they raised this amount of money; they have just done this, but I measure success in that they have got product in the market, and they are making money; not they have got a one-off payment or they have raised a grant. Success is not measured properly in this industry – why? Because there are virtually no successes to measure in this industry, so they are measuring things that aren't successful".(Director H)

On how the university arrives at KPIs and measures of success, Director M commented:

".. I don't know whether I should say this, but actually when you are setting targets and things, we will look at where we are currently, where the university might wish to go, and some of it will be heavily aligned with the strategic plan, over 5 years, and project out, and then look at what you would have to achieve annually to get there. Others, some of us, probably made some of the numbers up – an informed way of doing it."

The university's commercial company does not run its separate accounting system and is subject to the internal financial reporting and monitoring requirements of the university. Similarly, all research institutes and centres have their budgets to operate on and university generates monthly financial reports on performance.

A faculty accountant with responsibility for a large research institute commented that there are strict internal accounting and accountability requirements.

"For each individual project, we would create an individual accounting cost centre, to track both income and the expenditure. Cost centres are only to be opened after we have had a green light or approval given by the university research office". (Faculty Accountant G)

On external reporting to funding agencies he commented:

"Normally, the enormous progress report is focussing on the research content and how we are managing the research per se, as opposed to financial reporting. The control is within the individual researchers and the schools with which those researchers are associated with. They have a more detailed day-to day, or month-to-month management reporting going on."

Comments by a high profile researcher were that:

"Well, if we chase money through the research institute, the accountability is to the funder – they send in auditors. I have no accountability to the public that they have the right to know what we are doing." (Professor H)

6. Discussion

The case narratives described above provide useful insights into several issues relating to the central research question. Both universities operate within the same institutional environment and are subject to similar institutional pressures for conformity and convergence. Within the institutional environment are the regulative, normative and cultural-cognitive factors that determines to whom and for what universities are accountable. The regulatory environment is made of regulatory institutions such as government funding and audit agencies. Both case universities receive substantial funding from funding agencies and are subject to coercive pressures to comply with their strict accountability requirements to ensure ongoing funding support. As government makes funding allocations across certain priority research areas, both universities were coerced into creating structures and mechanisms designed to receive this funding. For example, funding for the CoREs will not go to the Premier University if it does not host these research centers. Similarly Universal University created some research institutes to specifically target government funding and clearly stated this as its key objective. Hence, the research institutes and centers provide legitimacy for funding allocations. Apart from the structural configuration, the communicative mechanisms also emphasized how much the universities rely on government funding to build their research capability and deliver the research outputs. Both universities felt that accountability is only to the funder and if the government had not provided funding then there is no accountability to government. So coercion is both ways here and this is understandable because of the dialectical nature of the accountability relationship between government and universities. Premier University channels it's funding from private sources relating to commercial projects to its commercial company. Under NPM model of public accountability, universities must set objectives, measure performance, and report on outcomes. However, both universities felt that they were under no obligation to do this as NPM model of public accountability only applies to public funded projects. By setting up commercial companies, both universities were able to decouple their commercial operations from the requirements of NPM reporting. This was a deliberate attempt by both universities to maintain secrecy over their commercialization activities and this may have created accountability deficits under the NPM model of public accountability in the form of non disclosure of commercialization objectives, performance measures, and outcomes. On the other hand, it was interesting to note that the commercial company of Premier University had adopted the NPM model for its internal reporting. This they did as a result of coercive pressure from the university to ensure that the goals of both the commercial company and the goals of the university are well aligned. The commercial company director M explained that *"the management will make sure that our strategic plan is actually parallel with the university's strategic plan, so we don't actually run in a different direction".*

Both universities were subject to n*ormative isomorphism* with an increasing focus on commercialization arising through the growth of researchers and their professional research networks that legitimate directions. In both universities there was a strong normative pressure from the researchers (institutional entrepreneurs) for professional autonomy to build research capability and capacity rather than be subject to bureaucratic accountability under NPM. There was much greater recognition that public and private science is more integrated, notably in norms and practices related to career advancement and in development and dissemination of knowledge. Both

firmly believed that commercialisation could allow researchers to be relevant and give something back to their community. It could help reach new audiences, and better understand the needs of the industry and make a valuable contribution to the economic and social goals of the nation. It could help build research capacity and capability, improve the research culture, and improve research performance leading to higher profile and reputation. The opportunity for collaboration with people from outside the university, from government agencies, businesses or industry, or from colleagues from other disciplines could greatly benefit by way of access to expertise, new contacts and partnerships, and stronger research relationships leading to possibly greater research funding. Both universities demonstrated a commitment to research excellence and prestige and professional rating concerns was a strong factor in influencing their decision to provide professional autonomy to their researchers. The number of research centres and institutes that have been created to operate as autonomous units within each university is a testimony to researchers' professional autonomy. This had also caused normative fragmentation at Universal University as more researchers and professors were hired (Oliver, 1992, p. 575) thus creating professional boundaries and tensions between academic and research missions. At both universities, the research centres and institutes were decoupled for 'sagacious conformity' and were used as legitimizing devices to secure both internal and external funding. However, these structural mechanisms also served as bridging mechanisms that helped in building an innovative and enterprising research culture as universities engaged in more collaborative research especially with international researchers. Larger research centres had the critical mass that assisted in attracting much need funding which also helped in building reputation and profile. They also served as buffering mechanisms from technical compliance and central control that threatened professional autonomy of the researchers.

The cultural-cognitive factors also had an impact on both universities since their accountability is shaped by socially constructed rules derived from the institutional environment. Both universities are expected to engage in commercialization of research, be innovative and enterprising, and contribute to the social and economic goals of the nation. Since commercialization has become powerfully adapted by the institutional environment, failure to participate will not provide them with legitimacy and resources. This will also adversely affect their reputation and rankings.

Since all universities operate in an institution environment, the pressure for conformity and homogenisation also leads to mimetic isomorphism as they tend to model themselves after similar successful organisations. Premier University has been a very successful and an established research university that models and benchmarks itself after some successful partner overseas universities. Hence it places top priority on its reputation and ranking. The emphasis on ratings and reputation has become its important communicative strategy which also legitimises its activities. On the other hand, Universal University is a new emerging university and has modelled itself on Premier University. This has given rise to similar structural mechanisms in the form of research institutes, research centres, and commercial companies at both universities, thus gaining an institutional status. Similarly, the communicative mechanisms of both universities in the form of narratives of commercialisation activities appear to be rationally constructed in order to enhance legitimacy and accountability relationships.

7. Conclusion

This study has demonstrated that enabling commercialisation of research at universities requires the co-operation of multiple and often competing stakeholders. The accountability relationships with these stakeholders are not linear but dialectical and poses a problem of "many hands" (Bovens, 2007). Therefore managing the dialectical accountability expectations is crucial in transforming university research into commercial outputs. This study was motivated by the challenges posed by the NPM model of public sector accountability that it has become a major obstacle to the work of well organised profession groups (Codd, 2005; Lapsley, 2008). In the university context this refers to the collaboration between academic researchers, industry, and other professional organisations involved in research commercialisation.

The two exploratory case studies highlighted how structural configurations and communicative strategies are used as accountability mechanisms to manage diverse stakeholders who have an important role to play in enabling commercialisation. The findings also suggest how the homogenizing pressure from the institutional environment has led to coercive, normative, and mimetic processes that cause organisations to adopt structural characteristics. These structures create professional boundaries, act as bridging mechanisms in collaborative research, as well as serve as legitimising devices to help secure much needed government funding. These structures also provide a buffer from the central control and accountability and reporting requirements of NPM. The communicative narratives indicate that legitimization rather than measurement of commercialisation results is important.

While the study focus was on structural and communicative strategies as key accountability mechanisms, an obvious extension to this study will be to conduct a much broader examination of detailed organisational processes and policies, governance mechanisms, and rewards and incentive schemes.

References

Abernethy, M. A., & Brownell, P. (1997). Management control systems in research and development organizations: The role of accounting, behavior and personnel controls. *Accounting, Organizations and Society, 22*(3-4), 233-248.

Abernethy, M. A., & Chua, W. F. (1996). A Field Study of Control System "Redesign": The Impact of Institutional Processes on Strategic Choice. *Contemporary Accounting Research, 13*(2), 569-606.

Ahrens, T., & Dent, J. (1998). Accounting and Organisations: Realizing the Richness of Field Research. *Journal of Management Accounting Research, 10*, 1-39.

Alvesson, M., & Karreman, D. (2004). Interfaces of control. Technocratic and socio-ideological control in a global management consultancy firm. *Accounting, Organisations and Society, 29*, 423-444.

Bisbe, J., & Otley, D. (2004). The effects of the interactive use of management control systems on product innovation. *Accounting, Organisations and Society, 29*, 709-737.

Bovens, M. (2007). Analysing and Assessing Accountability: A Conceptual Framework. *European Law Journal, 13*(No. 4), 447-468.

Brignall, S., & Modell, S. (2000). An Institutional Perspective on Performance Measurement and Management in the 'New Public Sector'. *Management Accounting Research, 11*, 281-306.

Burke, J. C. (2005). The Many Faces of Accountability. In J. C. Burke (Ed.), *Achieving Accountability in Higher Education: Balancing Public, Academic, and Market Demands* (First ed., pp. 1-24). San Francisco, CA: Jossey-Bass A Wiley Imprint.

Chua, W. F. (1995). Experts, networks and inscriptions in the fabrication of accounting images: A story of the representation of three public hospitals. *Accounting, Organizations and Society, 20*(2-3), 111-145.

Codd, J. (2005). Teachers as 'managed professionals' in the global education industry: the New Zealand experience. *Educational Review, 57*(No. 2), 193-206.

Covaleski, M. A., & Dirsmith, M. W. (1988a). An institutional perspective on the rise, social transformation, and fall of a university budget category. *Administrative Science Quarterly, 33*, 562-587.

Covaleski, M. A., & Dirsmith, M. W. (1988b). The Use of Budgetary Symbols in the Political Arena: An Historically Informed Field Study. *Accounting, Organizations and Society, 13*, 1-24.

Coy, D., & Pratt, M. J. (1998). An insight into accountability and politics in universities: a case study, *Accounting, Auditing, and Accountability Journal* (Vol. 11, pp. 540-561).

Davilla, T. (2000). An empirical study on the drivers of management control systems' design in new product development. *Accounting, Organisations and Society, 25*, 383-409.

Deem, R. (2001). Globalisation, New Managerialism, Academic Capitalism and Entrepreneurialism in Universities: is the local dimension still important? *Comparative Education, 37*(No.1), 7-20.

DiMaggio, P. J. (1988). Interest and agency ininstitutional theory. In L. G. Zucker (Ed.), *Institutional patterns and organizations: Culture and environment* (pp. 3-21). Cambridge, MA: Ballinger.

DiMaggio, P. J., & Powell, W. W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review, 48*(2), 147-160.

DiMaggio, P. J., & Powell, W. W. (1991). Introduction. In W. W. Powell & P. J. DiMaggio (Eds.), *The New Institutionalism in Organisational Analysis* (pp. 1-38). Chicago: The University of Chicago Press.

Ditillo, A. (2004). Dealing wth uncertainty in knowledge-intensive firms: the role of management control systems as knowledge integration mechanisms. *Accounting, Organisations and Society, 29*, 401-421.

Ezzamel, M., & Willmott, H. (1993). Corporate governance and financial accountability: Recent reforms in the UK public sector. *Accounting, Auditing & Accountability Journal, 6*(3), 109.

Findlow, S. (2008). Accountability and innovation in higher education: a disabling tension? *Studies in Higher Education, 33*(No. 3), 313-329.

Fligstein, N. (1991). The structural transformation of American industry: An institutional account of the causes of diversification in the largest firms, 1919-1979. In W. W. Powell & P. J. DiMaggio (Eds.), *The new institutionalism in organizational analysis* (pp. 311-336). Chicago: University of Chicago Press.

Glynn, J. J., & Perkins, D. (1997). Control and accountability in the NHS market: a practical proposition or logical impossibility? *The International Journal of Public Sector Management, 10*(1,2), 62.

Gray, R., Guthrie, J., & Parker, L. (2002). Rites of passage and the self-immolation of academic accounting labour: an essay exploring exclusivity versus mutuality in accounting scholarship. *Accounting Forum, 26*(1), 1-30.

Greenwood, R., & Hinings, C. R. (1996). UNDERSTANDING RADICAL ORGANIZATIONAL CHANGE: BRINGING TOGETHER THE OLD AND THE NEW INSTITUTIONALISM. *Academy of Management Review, 21*(4), 1022-1054.

Greenwood, R., & Hinings, C. R. (2006). Radical Organizational Change. In S. R. Clegg, C. Hardy, T. B. Lawrence & W. R. Nord (Eds.), *The Sage Handbook of Organization Studies* (Second ed., pp. 814-842). London: Sage Publications Ltd.

Greenwood, R., Suddaby, R., & Hinings, C. R. (2002). THEORIZING CHANGE: THE ROLE OF PROFESSIONAL ASSOCIATIONS IN THE TRANSFORMATION OF INSTITUTIONALIZED FIELDS. *Academy of Management Journal, 45*(1), 58-80.

Harlow, C., & Rawlings, R. (2007). Promoting Accountability in Multilevel Governance: A Network Approach. *European Law Journal, 13*(No. 4), 542-562.

Hood, C. (1991). A Public Management for All Seasons. *Public Administration, 69(1)*, 3-19.

Jepperson, R. L., & Meyer, J. W. (1991). The Public Order and the Construction of Formal Organizations. In W. W. Powell & P. J. DiMaggio (Eds.), *The New Institutionalism in Organizational Analysis* (pp. 204-231). Chicago: The University of Chicago Press.

Jones, R. (1992). THE DEVELOPMENT OF CONCEPTUAL FRAMEWORKS OF ACCOUNTING FOR THE PUBLIC SECTOR. *Financial Accountability & Management, 8*(4), 249.

Juniper, J. (2002). Universities and collaboration within complex, uncertain knowledge-based economies. *Critical Perspectives on Accounting, 13*, 747–778.

Koppell, J. (2005). Pathologies of Accountability: ICANN and the Challenge of "Multiple Accountability Disorder". *Public Administration Review, 65*, 94.

Lapsley, I. (2008). The NPM Agenda: Back to the Future. *Financial Accountability & Management, 24*(1), 77-96.

Lapsley, I., & Miller, P. (2004). Transforming universities: the uncertain, erratic path *Financial Accountability & Management, 20*(2), 103-106.

Leblebici, H., Salancik, G. R., Copay, A., & King, T. (1991). Institutional change and the transformation of interorganizational fields: An organizational history of the U.S. radio broadcasting industry. *Administrative Science Quarterly, 36*, 333-363.

Lounsbury, M. (1999). From Heresy to Dogma: An Institutional History of Corporate Environmentalism. *Administrative Science Quarterly, 44*(1), 193-195.

Macintosh, N. B., & Daft, R. L. (1987). Management control systems and departmental interdependencies: an empirical study. *Accounting, Organisations and Society, 12*(1), 49-61.

Meyer, A. D. (1982). Adapting to Environmental Jolts. *Administrative Science Quarterly, 27*(4), 515-537.

Meyer, A. D., Brooks, G. R., & Goes, J. B. (1990). Environmental Jolts and Industry Revolutions: Organizational Responses to Discontinuous Change. *Strategic Management Journal, 11*, 93-110.
Meyer, J. W., & Rowan, B. (1977). Institutionalized Organizations: Formal Structure as Myth and Ceremony. *American Journal of Sociology, 83*(2), 340.
Miles, M. B., & Hubermann, A. M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook, 2nd Edition* (2nd ed.). London: Sage Publications.
Neumann, R., & Guthrie, J. (2002). The corporatization of research in Australian higher education. *Critical Perspectives on Accounting, 13*, 721–741.
O'Neill, O. (2002). *A Question of Trust*. Cambridge: Cambridge University Press.
Oliver, C. (1991). Strategic Responses to Institutional Processes. *Academy of Management Review, 16*(1), 145-179.
Oliver, C. (1992). The antecedents of deinstitutionalization. *Organization Studies, 13*, 563-588.
Parker, L., Guthrie, J., & Gray, R. (1998). Accounting and management research: Passwords from the Gatekeepers. *Accounting, Auditing & Accountability Journal, 11*(4), 371-402.
Patton, M. Q. (1990). *Qualitative Evaluation and Research Methods* (2 ed.). Newbury Park: Sage Publications.
Scott, C. (2000). Accountability in the Regulatory State. *Journal of Law and Society, 27*(38).
Scott, W. R. (2001). *Institutions and Organizations* (2nd ed.): Thousand Oaks, CA: Sage
Scott, W. R. (2003). *Organizations: Rational, Natural, and Open Systems* (5th International ed.). New Jersey: Pearson Education Inc, Prentice Hall.
Scott, W. R., & Meyer, J. W. (1991). The Organization of Societal Sectors: Propositions and Early Evidence. In W. W. Powell & P. J. DiMaggio (Eds.), *The New Institutionalism in Organizational Analysis*. Chicago: The University of Chicago Press.
Silverman, D. (2005). *Doing qualitative research: A practical handbook* (2nd ed.). Thousand Oaks, CA: Sage Publications.
Simons, R. (1995). *Levers of control: how managers use innovative control systems to drive strategic renewal*. Boston: Harvard Business School Press.
Subramanian, R., Insley, R. G., & Blackwell, R. D. (1993). Performance and Readability: A Comparison of Annual Reports of Profitable and Unprofitable Corporations. *Journal of Business Communication, 30*(1), 49-61.
Tushman, M. L., & Anderson, P. (1986). Technological Discontinuities and Organizational Environments. *Administrative Science Quarterly, 31*(3), 439-465.
Yin, R. (1994). *Case Study Research, Design and Methods* (2nd ed ed.). Newbury Park: Sage Publications.

Appendix A

Interview Questions:

1) What factors are prompting the increase in expectation for research commercialisation?

2) How responsive is the TEI to the pace of commercialisation?

3) What are the obstacles and challenges and how these are managed?

4) How commercialisation is actualised, that is, are there alternative models of commercialisation and if so, what are the different configurations of these models?

5) How are these models implemented? What factors influence its choice?

6) What are the outcomes of these models – both positive and negative aspects?

7) How are the outcomes measured and reported and possible incentives and disincentives attached to it?

Questions on Accountability:

8) What are the primary rationales that underly TEI's accountability approaches to research commercialisation?

9) What factors determine to whom and for what TEIs are accountable to?

10) Who are the opinion leaders and key stakeholders and what are their roles in fostering commercialisation?

11) What mechanisms do TEIs employ to manage the stakeholder expectations?

12) How is performance measured and reported? What is being measured and reported? Why?

13) What is the role of the annual report?

14) What is the scope, purposes and modus operandi of voluntary reporting strategies?