

CRANFIELD UNIVERSITY

Dr. LEONARD L KELLEHER

RESEARCH IMPACT: AN INSTITUTIONAL LOGICS
PERSPECTIVE OF RELATED TENSIONS IN HIGHER
EDUCATION

CRANFIELD SCHOOL OF MANAGEMENT

PhD

Academic Year: 2014 - 2019

Supervisor: Professor Mark Jenkins
Associate Supervisor: Professor Palie Smart
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ABSTRACT

The UK Higher Education sector's emphasis on research "impact" (economic, social, environmental and cultural benefits) leads to tensions which academics are often ill-equipped to navigate. Our understanding of such tensions is largely limited by a narrow empirical focus on knowledge commercialisation and oversimplified conceptualisations of the underlying process of change.

This study employs an exploratory, holistic multiple case design to explore tensions experienced by 30 business and management scholars and participants in the 2014 Research Excellence Framework (REF2014), the first national evaluation of research impact globally. It deploys institutional logics as a conceptual lens as this is underpinned by a theory of action (embedded agency) offering greater explanatory power for how macro- and meso-level factors influence micro level behaviour than alternatives predominantly used in existing explorations of impact.

Six major findings regarding individual level impact-related tensions are reported at the 'individual' level of analysis. First, three novel tensions were identified. Second, eight conceptual tensions were empirically observed. Third, certain tensions are underpinned by forms of embeddedness not currently associated with the institutional logics perspective. Fourth, most of the identified tensions are not associated with an often alluded to professional-market logics dualism, but with various configurations of five logics. Fifth, certain tensions are associated with a single, professional logic. Sixth, strategic responses to certain tensions are typically generative of impactful research, although occasionally defensive responses can also be generative.

Three theoretical contributions are proposed. First, the empirical confirmation of a typology of individual-level impact-related tensions, within which three novel tensions are identified. Second, the development of the logics perspective through revelation of new types of embeddedness as theories of change and third; the conceptualisation of institutional monism as an alternative source of conflicting logics to institutional pluralism. Finally, a contribution to professional

research practice is also made in recommending that barriers to research effectiveness should be responded to strategically rather than defensively in order to maximise impact generation.

Keywords: Institutional logics, embeddedness, impact, tensions, paradox

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This dissertation is the outcome of a curiosity itch I first noticed almost ten years ago, when impact was but a glimmer in HEFCE's eye. This itch concerned discrepancies between the roles of academic knowledge as I saw them and predominant narratives within academic, policy and public discourse. After unsuccessfully trying to scratch the itch through lay person readings, I embarked on a doctoral journey. Its benefits, I hope, will continue now that this part of the journey comes to an end.

This work would not have been possible without the support that Cranfield has variously provided over the last 5 years. I am indebted in particular to those who served as my supervisor at various times, Javier Marcos, Palie Smart and Mark Jenkins. Your enthusiasm maintained my momentum, your challenges tempered my exuberance and your knowledge opened new vistas for me. The same might be said for my panel members, Jonathan Lupson and David Denyer, and for Andrey Pavlov who was instrumental in my topic choice. Thank you to Mary Betts-Grey and the MIRC staff, whose patience and expertise is appreciated in equal measure. Thank you to the research office staff, particularly Debbie Bramwell, Irena Pidlyskyj and Sandra Bettison, for their support and assistance. I would also like to thank the interviewees who very kindly gave their time to talk to me for this research.

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LIST OF ABBREVIATIONS

APEC	Asia-Pacific Economic Cooperation
BIS	Department for Business, Innovation and Skills
CABS	Chartered Association of Business Schools
CoP	Community of practice
DTI	Department for Trade and Industry
ECR	Early career researcher
ESRC	Economic and Social Research Council
EU	European Union
HE	Higher education
HEFCE	Higher Education Funding Council for England
HEI	Higher education institution
HR	Human resources
IMF	International Monetary Fund
IPR	Intellectual property management
MBA	Master of Business Administration
NHS	National Health Service
NSS	National Students Survey
OECD	Organisation for Economic Co-operation and Development
PhD	Doctor of Philosophy
PI	Principle investigator
PwC	PricewaterhouseCoopers
R&D	Research and development
RAE	Research Assessment Exercise
REF2014	Research Excellence Framework 2014
SME	Small or medium enterprise
SPIS	Science, policy and innovation studies
SSRN	Social Science Research Network
STS	Science and technology studies
UOA	Unit of assessment

Glossary of terms

Absorptive capacity	The ability to identify, assimilate, and exploit knowledge from the environment (Cohen and Levinthal, 1990)
Academic engagement'	"Knowledge-related collaboration by academic researchers with non-academic organisations" (Perkmann et al., 2013)
Autonomous authority	Disinterest in socially dominant audiences outside the profession and field of scientific knowledge production (Gauchat and Andrews, 2018)
Case study	"An empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009, p.18)
Circuit of knowledge	Networks linking state agencies, corporations and universities in entrepreneurial research endeavours (Slaughter and Cantwell, 2012)
Co-variance	Claims that a phenomenon co-varies with an underlying independent variable (Baghranian, 2014, pp.1–9)
Cognitive embeddedness	Ways in which the structured regularities of mental processes limit the exercise of economic reasoning (Zukin and Dimaggio, 1990, p.17)
Cognitive values	"Those aspects of scientific work that help scientists think through the evidential and inferential aspects of theories and data" (Douglas, 2009, p.93)
Cosmopolitanism	"A manifestation of the mentality of the global elite, as world citizenship, as a politics of human rights, as a religion of humanity and as global mores" (Ossewaarde, 2007)
Cultural embeddedness	The role of shared collective understandings in shaping economic strategies and goals (Zukin and Dimaggio, 1990, p.17)
Definition of science	Delimitation of the problems, methods and theories regarded as scientific within a field (Bourdieu, 1975)
Discipline	"The tools, methods, procedures, exempla, concepts and theories that account coherently for a set of objects or subjects" (Klein, 1990, p.104)
Embedded agency	The assumption that the interests, identities, values, and assumptions of individuals and organisations are embedded within logics (Thornton and Ocasio, 2013, p.103)
Embedded liberalism	Reconciliation between the efficiency of markets and the values of social community that markets themselves require in order to survive and thrive, the dominant post-World War II Western economic paradigm (Ruggie, 1982)

Engaged scholarship	“Collaborative form(s) of inquiry in which academics and practitioners leverage their different perspectives and competencies to coproduce knowledge about a complex problem or phenomenon that exists under conditions of uncertainty found in the world” (van de Ven and Johnson, 2006)
Epistemic embeddedness	A situation where the reality to which (expert knowledge creation and validation) activities are oriented is no longer simply the ‘natural reality out there’ as interpreted within a frame of reference of personal experience and social conventions...(but) a reality purposefully assembled and unfolded by professional knowledge workers and whole technological systems which provide frames of reference and the means for experience and transactions to take place (Knorr-Cetina and Preda, 2001, pp.30–31)
Epistemic values	“Basic criteria that any scientific work must meet” to produce reliable knowledge (Douglas, 2009, pp.92–94).
Gemeinschaft	The communal solidarity which gave the modern nation-state its deeper legitimacy (Cerny, 1997)
General scientific authority	Privileging of scientific knowledge over other forms of knowledge creation (Gauchat and Andrews, 2018)
Habitus	The “acquired system of generative schemes objectively adjusted to the particular conditions in which it is constituted” (Bourdieu, 1977, p.95)
Heteronomous authority	Compatibility of science with dominant interests in economic and political centres of power (Gauchat and Andrews, 2018)
Impact	“An effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia” (HEFCE, 2011)
Institutional logic	“Socially constructed, historical patterns of cultural symbols and material practices, including assumptions, values, and beliefs, by which individuals and organisations provide meaning to their daily activity, organize time and space, and reproduce their lives and experiences” (Thornton, Ocasio and Lounsbury, 2012, p.2)
Institutional order	“A domain of institutions built around a cornerstone institution that represents the cultural symbols and material practices that govern a commonly recognized area of life” (Thornton, Ocasio and Lounsbury, 2012, p.54)
Innovation studies	“The scholarly study of how innovation takes place and what the important explanatory factors and economic and social consequences are” (Fagerberg, Fosaas and

	Sapprasert, 2012)
Interdisciplinarity	An interactive process in which researchers work jointly, drawing from their own discipline-specific perspective, to address a common research problem (Stokols et al., 2008)
Institutional pluralism	The situation faced by an actor that operates within multiple institutional spheres (Kraatz and Block, 2013, p.243),
Knowledge commercialisation	The “process of monetising knowledge, with or without knowledge transfer” (Baycan and Stough, 2012)
Knowledge compatibility	The level of match between the knowledge bases of either actor of a dyad (Nielsen, 2005)
Knowledge complementarity	Skills and resources that a collaborating partner needs but does not have (Nielsen, 2005)
Knowledge embeddedness	The process of effectively linking together one actor’s productive knowledge with that of another through qualitative coordination (Nielsen, 2005)
Knowledge protectiveness	The safeguards in place against opportunistic behaviour in a collaborating dyad (Nielsen, 2005)
Knowledge valorisation	“The transfer of knowledge from one party to another for economic benefit” (Baycan and Stough, 2012)
Market embeddedness	The extent to which market operations are affected by social relations of the actors involved (Frenzen and Davis, 1990)
Moral embeddedness	The role morally oriented behaviour plays in market exchange (Ballet and Pouchain, 2015; Beckert, 2005)
Nested embeddedness	The extent to which an actor’s behaviour is influenced by being embedded within a nested structure of institutional layers (Kenney and Goe, 2004)
Neoliberalism	“A theory of political economic practices that proposes that human wellbeing can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong property rights, free markets and free trade” (Harvey, 2005, p.2)
Occupational embeddedness	The totality of forces that keep people in their current occupations (Ng and Feldman, 2007)
Open science	The movement to make scientific research and its dissemination accessible to all levels of an inquiring society, amateur or professional
Organisational embeddedness	The totality of forces that keep people in their current employment (Ng and Feldman, 2007)
Paradox	“Contradictory yet interrelated elements that exist simultaneously and persist over time” (Smith and Lewis,

	2011)
Political embeddedness	The manner in which economic institutions and decisions are shaped by the struggle for power that involves economic actors and nonmarket institutions (Zukin and Dimaggio, 1990, p.17)
Problem of embeddedness	The conceptualisation of behaviour and institutions as independent misunderstands the degree to which they are constrained by social relations (Granovetter, 1985)
Progressive coherence	A shared theoretical perspective that has advanced over time (Locke and Golden-Biddle, 1997)
Reach	“The spread or breadth of influence or effect (of impact) on the relevant constituencies” (HEFCE, 2012)
Relational embeddedness	The personal relationships people have developed with each other through a history of interactions (Nahapiet and Ghoshal, 1998)
Research effectiveness	Whether research led to societal benefits (Hinrichs-Krapels and Grant, 2016)
Research efficiency	How productive the research system is and whether research is happening at an appropriate rate (Hinrichs-Krapels and Grant, 2016)
Research equity	Whether research is achieving specific goals, reaching certain beneficiaries, or addressing specific health needs (Hinrichs-Krapels and Grant, 2016)
Science and technology studies	The study of how society, politics, and culture affect scientific research and technological innovation, and how these, in turn, affect society, politics and culture (Martin, Nightingale and Yegros-Yegros, 2012)
Science, policy and innovation studies	The field “devoted to analyzing, understanding and effectively responding to the economic, policy, management, organizational, environmental and other challenges posed by innovation, technology, R&D and science” (Martin, 2012)
Scientific credibility	Scientists’ ability to do science (Latour and Woolgar, 1986, p.198)
Significance	“The intensity of the influence or effect” (of impact) (HEFCE, 2012)
Social contract for science	the implicit agreement and set of mutual expectations between science and the state wherein government funds and cedes authority to the scientific community in questions of what work should be done in return for the production of scientifically-reliable knowledge (Martin, 2003, p.7)
Socially robust	Knowledge likely to be reliable not only inside but also

knowledge	outside the laboratory (Gibbons, 1999)
Social embeddedness	The contextualisation of economic activity in on-going patterns of dyadic relations and... the structure of the overall network of relations (Granovetter, 1992, p.33)
Stratification	The social hierarchy produced by welfare state policies (Willemse and de Beer, 2012).
Structural embeddedness	The impersonal configuration of linkages between people or units (Nahapiet and Ghoshal, 1998)
Tacitness	The degree to which knowledge is subjective, difficult to formalise, articulate, and communicate to others (Huang, Hsieh and He, 2014).
Technological embeddedness	The way in which technology introduces a material aspect to organisational elements such as routines, roles, and data (Volkoff, Strong and Elmes, 2007)
Temporal embeddedness	The social ordering effects of time...that shape opportunity and stratification across levels of analysis (Dacin, Ventresca and Beal, 1999)
Tensions	A “variety of dichotomies, dualities, conflicts, inconsistencies and contradictory pulls or demands experienced by those in a particular setting that appear to represent different and contradictory poles and, as such, seem to require a choice of one or the other” (Bartunek and Rynes, 2014).
Theory of action	“(A) theory of deliberate human behavior, which is for the agent a theory of control but which, when attributed to the agent, also serves to explain or predict his behavior” (Argyris and Schön, 1974, p.6)
Transdisciplinarity	Comprehensive frameworks that transcend the narrow scope of disciplinary worldviews through an overarching synthesis for defining and analysing social, economic, political, environmental, and institutional factors in human health and well-being. More recently, the term has also connoted a new mode of knowledge production that draws on expertise from a wider range of organisations, and collaborative partnerships for sustainability that integrate research from different disciplines with the knowledge of stakeholders in society. (Wagner et al., 2011)

1 INTRODUCTION

This chapter introduces the phenomenon of interest and provides an overview of the research on the basis of both theoretical and empirical observations and analyses. The chapter concludes by outlining the remainder of this thesis.

1.1 The phenomenon of interest

This thesis explores tensions experienced at an individual level in the context of research impact (hereafter, impact-related tensions). The *impact* of academic research is defined as “an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia” (HEFCE, 2011). *Tensions* refer to a “variety of dichotomies, dualities, conflicts, inconsistencies and contradictory pulls or demands experienced by those in a particular setting that appear to represent different and contradictory poles and, as such, seem to require a choice of one or the other” (Bartunek and Rynes, 2014).

There is an intensifying expectation from policy makers, industry, civil society and some within academia for the derivation of impact from academic research. The origin of this expectation is often taken as the US Bayh-Dole act (Popp Berman, 2008) in 1980, which targeted the problem of intellectual property lock-up involving federally funded academic research, and similar policies subsequently adopted elsewhere. In reality, it may be understood as symptomatic of an historically contested and fluctuating social contract between the institutional university (hereafter, “the University”) and the state (Bhattacharya, 2012; Guston and Keniston, 1994; Martin, 2003), or the changing societal role of knowledge (Delanty, 2001a; Lyotard, 1984). In the years since Bayh-Dole, the promotion of entrepreneurship and innovation within the University, the so-called “third mission” in addition to teaching and research, has become globally ubiquitous (Etzkowitz, Ranga and Dzisah, 2012; Grimaldi et al., 2011), and a range of knowledge transfer and co-creation activities have been adopted by universities (Eun, Lee and Wu, 2006; Veugelers, 2016).

Impact was introduced as part of the UK's 2014 Research Excellence Framework (REF2014), constituting the first national systematic evaluation of research according to societal effects as well as academic excellence (Hinrichs-Krapels and Grant, 2016). It was modelled on the Australian Research Quality Framework (Donovan, 2008) adopting its quadruple bottom line approach of assessing social, economic, environmental and cultural effects, as well as its qualitative case study-based format. In total, 154 UK higher education institutions (HEIs) submitted 6,975 impact case studies, detailing the *reach* ("the spread or breadth of influence or effect on the relevant constituencies") and *significance* ("the intensity of the influence or effect") (HEFCE, 2012) of impact underpinned by academic research (Kings College London; Digital Science, 2015). These were assessed under 36 unit of assessment (UOA) sub-panels guided by four main panels, life sciences (A), engineering and physical sciences (B), social sciences (C) and arts & humanities (D) (HEFCE, 2012). Assessment results at HEI and UOA levels, as well as 6,679 non-redacted case studies, have since been made available through a publicly-accessible database (HEFCE, 2014).

The introduction of impact therefore represents a considerable broadening of the third mission beyond entrepreneurship and innovation, and may be expected to lead to the emergence of new tensions in addition to those associated with this mission (see Section 2.1). To date, however, studies of impact have focussed on development of the concept and metric (Battaly, 2013; Bornmann, 2013; Broadbent, 2010; Colley, 2014; Fini et al., 2018; Gray, Broadbent and Lavender, 2009; Hinrichs-Krapels and Grant, 2016; Khazragui and Hudson, 2015; McNie, Parris and Sarewitz, 2016; Mryglod et al., 2015; Murphy and Sage, 2014; Ní Mhurchú et al., 2017; Nolan, Ingleton and Hayter, 2008; Penfield et al., 2014; Redman, Haynes and Williamson, 2015; Sivertsen, 2017; Smith, Ward and House, 2011; Trevorrow and Volmer, 2012; Vincent, 2015; Watermeyer, 2014, 2016) and impact evaluation (Bozeman and Youtie, 2017; Fedorciow and Bayley, 2014; Greenhalgh and Fahy, 2015; Hughes and Kitson, 2012; Kellard and Śliwa, 2016; Ovseiko, Oancea and Buchan, 2012; Pidd and Broadbent, 2015; Samuel and Derrick, 2015; Shortt et al., 2016;

Smallman, Lock and Johnson, 2016; Stuart, 2015). Studies of the practice of impactful research are rare (Cunliffe and Scaratti, 2017; Holt, Goulding and Akintoye, 2014; MacIntosh et al., 2017; Pettigrew, 2011; Salter, Salandra and Walker, 2017; Sealy et al., 2017). Indeed, Lam (2010) notes that understanding even of the third mission and its consequences for academic scientific work has been limited by a narrow empirical literature focus, predominantly on particular intellectual property regimes that shape the work situations of academic scientists.

Nonetheless, studies of the third mission do provide a useful starting point for exploration of the effects of impact on academic research. According to Glenna (Glenna et al., 2011), such studies tend to implicitly utilise either rational choice or structuralism as competing theories of action, i.e. theories “of deliberate human behavior, which is for the agent a theory of control but which, when attributed to the agent, also serves to explain or predict his behavior” (Argyris and Schön, 1974, p.6). Both are problematic in that they include oversimplified theoretical assumptions about the underlying process of change (Lam, 2010), particularly how macro- and meso-level factors influence micro level behaviour.

Structuralist approaches hold that social structural factors rather than personal motivations or capabilities influence individual decisions and social action. Individual actors are regarded as “socially constrained automatons” (Popp Berman, 2008) within political-organisational infrastructures of overt and covert rules. This is implicit in Merton’s claim that his seminal ethos of science “is that affectively toned complex of values and norms which is held to be binding on the man of science” (Merton, 1973, pp.268–9). The predominant conceptualisation of impact which draws on the structuralist perspective is the triple helix model (Etzkowitz and Leydesdorff, 2000). While this model largely ignores impact tensions (Tuunainen, 2002), Etzkowitz (2011) makes an unsubstantiated claim that normative tensions are replaced by complementary expectations and consistent identities through sociological consonance.

Rational choice models assume that actors possess thin rationality, that is choice preferences are made by purposively rational and self-interested actors

based on consideration of utility maximisation (Abell, 2000; Herne and Setälä, 2004). However, rational choice has been criticised for offering poor explanatory power where actors follow normative, non-consequentialist prescriptive beliefs or where behaviour cannot be assumed to be dictated by self-interest (Boudon, 2009, p.185). Slaughter and Leslie's academic capitalism (1999, p.114) draws on this theory of action through employing resource dependence theory to account for both universities and faculty engaging in market and market-like behaviour in pursuit of critical resources. Academic capitalism offers perhaps the most comprehensive accounts of impact-related tensions at field and group levels [(Hackett, 1990, 2005) see Section 2.1], concerning academic autonomy versus dependence, modes of collegial and legal-rational authority, and the transformational versus instrumental value of science.

Both rational choice and structuralism suffer from the problem of embeddedness (Granovetter, 1985) by providing under- and over-socialised conceptualisations respectively of behaviour and institutions as independent, thereby misunderstanding the degree to which they are constrained by social relations. Consequently, policy underpinned by either structuralism or rational choice tends to adopt an undifferentiated approach, neglecting heterogeneity in individual-level academic values (Glenna et al., 2011), motivations and identities (Lam, 2011). Glenna (ibid) notes that such policy has led to concerns that basic and publicly accessible research may be neglected in favour of knowledge commercialisation.

In this study, the view is taken that investigations of impact's effects on academic research should adopt alternative theories of action which illuminate heterogeneous macro-micro and meso-micro mechanisms and effects, and thereby facilitate differentiated policy design. One such approach, neoinstitutionalism (DiMaggio and Powell, 1983; Meyer and Rowan, 1977) overcomes the problem of embeddedness by highlighting the roles of culture and cognition in institutional analysis. However, this approach emphasises isomorphism in organisational structures in response to rationalising or

legitimising tendencies, and so is of limited utility in illuminating heterogeneity. The institutional logics perspective also overcomes the problem of embeddedness by linking structural (coercive), normative and symbolic dimensions of institutions with individual agency through a situated, embedded, boundedly intentional model of human behaviour and interaction (Thornton, Ocasio and Lounsbury, 2012, p.78). It also offers a lens to explore micro-level heterogeneity through a conceptualisation of society as an inter-institutional system of orders, each with a central logic (Thornton, Ocasio and Lounsbury, 2012, p.73) which offers actors partial autonomy in maintaining, reproducing or transforming institutional norms and structures. Work on logics “is inherently cross-level, highlighting the interplay between individuals, organizations, and institutions” (Thornton and Ocasio, 2013, p.120).

To date, studies deploying a logics perspective in impact contexts have been limited to explorations of knowledge commercialisation (the process of monetising knowledge, with or without knowledge transfer) (Baycan and Stough, 2012) from the physical, life or applied sciences. They have predominantly assumed “an institutional change that occurs as a linear historical process in which the old institutional logic of academic science is under attack...and will be eventually replaced by the new logic of entrepreneurial science” (Lam, 2010). In doing so, they maintain the notion of a “protected space” (Rip, 2011) for science in which the relevance of scientific knowledge production goes unquestioned while the production and dissemination processes themselves are emphasised (Flink and Kaldewey, 2018). A more holistic exploration, in which scientific relevance holds no *prima facie* protection, is overdue.

1.2 Overview of the research

This study applies a relativist, abductive, middle-range approach to explore impact-related tensions experienced by business and management academics through the lens of institutional logics. It is premised on an holistic multiple-case design, exploring the experiences of 30 focal

academics in 32 REF2014 impact case studies, selected from a total pool of 432 submissions to the business and management UOA. Specifically, it addresses the following research question:

How and why do interactions between institutional logics lead to tensions in the context of research impact?

In doing so, a series of problematisations (Locke and Golden-Biddle, 1997) associated with the logics perspective are highlighted:

- An inadequacy problematisation regarding types of embeddedness which constitute theories of action;
- An incommensurability problematisation concerning the assumption of institutional pluralism as the only source of contradictory logics;
- An incompleteness problematisation regarding a focus in studies on knowledge commercialisation involving the physical, life or applied sciences.

Based on these problematisations, the logics perspective is developed by revealing new types of embeddedness as theories of change and by conceptualising institutional monism as an alternative source of tensions to institutional pluralism. Additionally, the empirical confirmation of a typology of individual-level impact-related tensions is described, within which three novel tensions are identified, and a novel analytical framework of “impactful research” is developed.

This work is predominantly a response to Bartunek and Rynes’ (2014) call to use tensions to foster research and theory building rather than treat them as dichotomies to be overcome, and their observation of a paucity of research concerning tensions in impact-related contexts. It is also a response to Lam’s (2010) observation of a tendency to view the societal system of science as binary, consisting of academic (professional) and entrepreneurial (market) logics, and her call for further study on how individual academic orientations can be mediated by disciplinary and institutional contexts. Finally, as a contribution

to professional research practice, it is argued that Nurse's (2015, p.3) call for "artificial barriers...(to) be resisted as they reduce (research) effectiveness" may have unintended detrimental consequences where resistance is interpreted as a defensive response to an underlying tension. Instead, it is recommended that barriers should be responded to strategically rather than defensively in order to maximise impact generation. The utility of this contribution at individual and organisational levels is elaborated.

1.3 Structure of the thesis

This thesis is composed of seven chapters. This chapter introduced the phenomenon of interest as impact-related tensions, and the context as business and management research impact. Chapter 2 continues by positioning the relevant literature domains and providing a theoretical foundation for this study.

Chapter 3 uses this theoretical basis to establish a conceptual framework, aggregating the relevant explanatory concepts into a composite framework. This frames the study, providing the research question.

Chapter 4 explains the methodology used to answer the research question. It provides an account of the empirical approach through a discussion of the research philosophy and design, and the data collection and analysis processes.

Chapter 5 presents the research findings, including 30 case narratives, a within-case analysis and a cross-case analysis of patterns. It identifies a typology of impact-related tensions and discusses the responses to these tensions.

Chapter 6 discusses these patterns, linking the observations back to the relevant literature domains and knowledge gaps. This chapter describes the study's contributions to both theoretical and practical knowledge.

The last chapter summarises the study and its theoretical and practical contributions, then turning to its limitations, the dissemination of further work, and suggestions for future research.

2 POSITIONING THE RESEARCH

This chapter positions this research project within existing literature, and is divided in four sections, an exploration of known tensions which emerge in research, knowledge commercialisation or impact contexts, an introduction to institutional logics and its perspective of impact, an introduction to embeddedness and its perspective of impact, and responses to tensions.

2.1 Known tensions in research or impact contexts

This section describes an integrative synthesis (Rousseau, Manning and Denyer, 2008) of tensions which may emerge in contexts of academic research or impact. This synthesis was developed through both a systematic review (Tranfield, Denyer and Smart, 2003) and a manual review of literature predominantly from three domains: science and technology studies (STS), science, policy and innovation studies (SPIS) and innovation studies (Figure 2-1).

2.1.1 Overview of literature domains

STS is an emerging field, and as such is dominated by books rather than papers (Martin, Nightingale and Yegros-Yegros, 2012), making literature searching difficult. Both innovation studies (Fagerberg, Fosaas and Sapprasert, 2012) and SPIS (Martin, 2012) are well-established fields with several core texts signalling degrees of consensus.

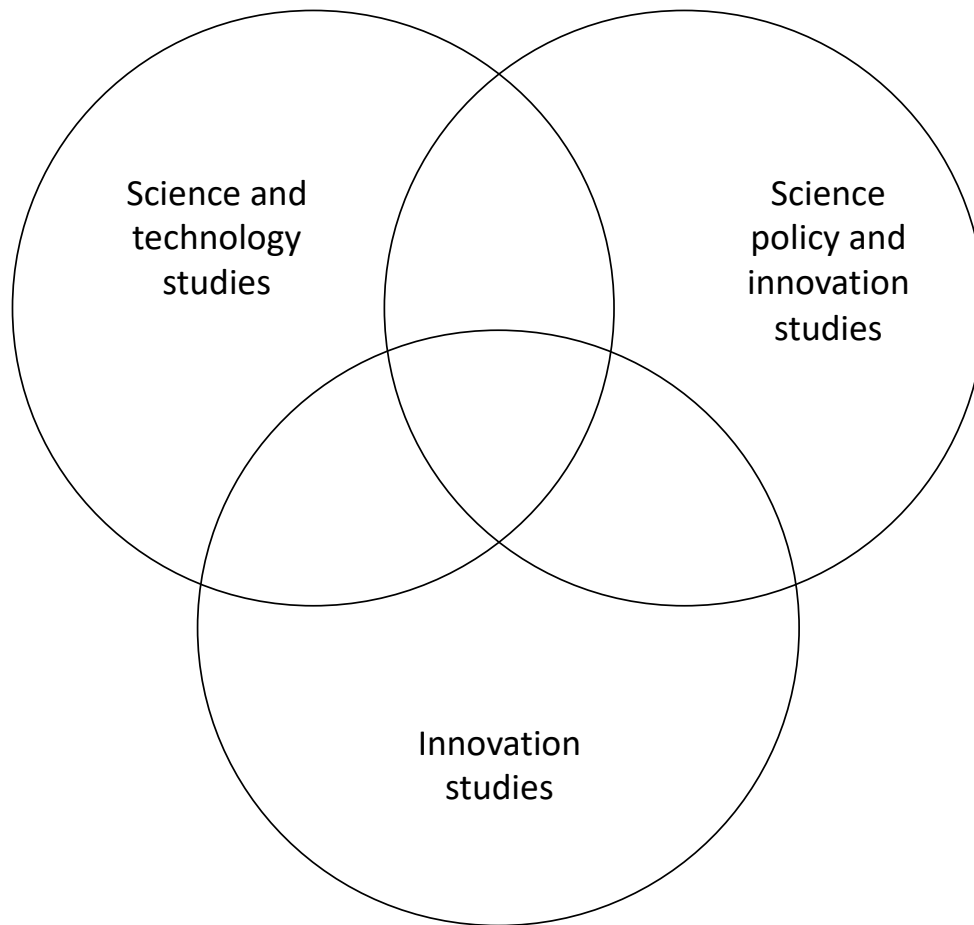


Figure 2-1 Literature domains

Rip (2011, p.198) notes a division of intellectual labour in the study of science's relationship with society. Philosophy of sciences approaches (encompassed within STS) focus on the core epistemic business of science while neglecting the nature and effects of its autonomy. Sociology of science (encompassed within SPIS) approaches focus on the boundary of science while neglecting its epistemologies, and laboratory studies (also SPIS) focus on internal dynamics of science at micro and meso levels while neglecting society altogether. The field of innovation studies often views science as an input to organisational, network or systems-level innovation activities. Thus, while these fields overlap, reconciliation of tensions discussed in the literature domains of each has not been undertaken.

2.1.2 Literature search strategy

For SPIS and innovation studies, a systematic literature review methodology (Tranfield, Denyer and Smart, 2003) consisting of five steps was employed, described below. This methodology proved inappropriate for STS as an emerging field dominated by books. Instead, the 20 top contributions to STS (Martin, Nightingale and Yegros-Yegros, 2012) were manually searched for tensions, along with contributions chosen by snowballing techniques due to their relevance to the research topic.

2.1.2.1 Question formulation

The scope, research question, protocol and inclusion/exclusion criteria were established in dialogue with a guidance panel consisting of academics. The chosen question of the literature search was:

What tensions have been explored in research and impact contexts?

2.1.2.2 Locating studies

The search strategy (Figure 2-2) consisted of looking for relevant studies in both the academic and grey literatures. An initial literature scoping helped to identify keywords and search strings relating to impact. Three electronic databases, EBSCO Business Source Complete, ISI Web of Science and ABI/Inform Complete were chosen for the dual purpose of maximising the range of literature searched while minimising researcher bias. These were supplemented by manual searches of SSRN, websites of relevant organisations (World Bank, Royal Society, OECD) and both books and papers chosen on the strength of expert recommendations and snowballing (37 books and 17 papers). From these, a shortlist of 105 papers and 20 books were chosen for further analysis (Appendix A).

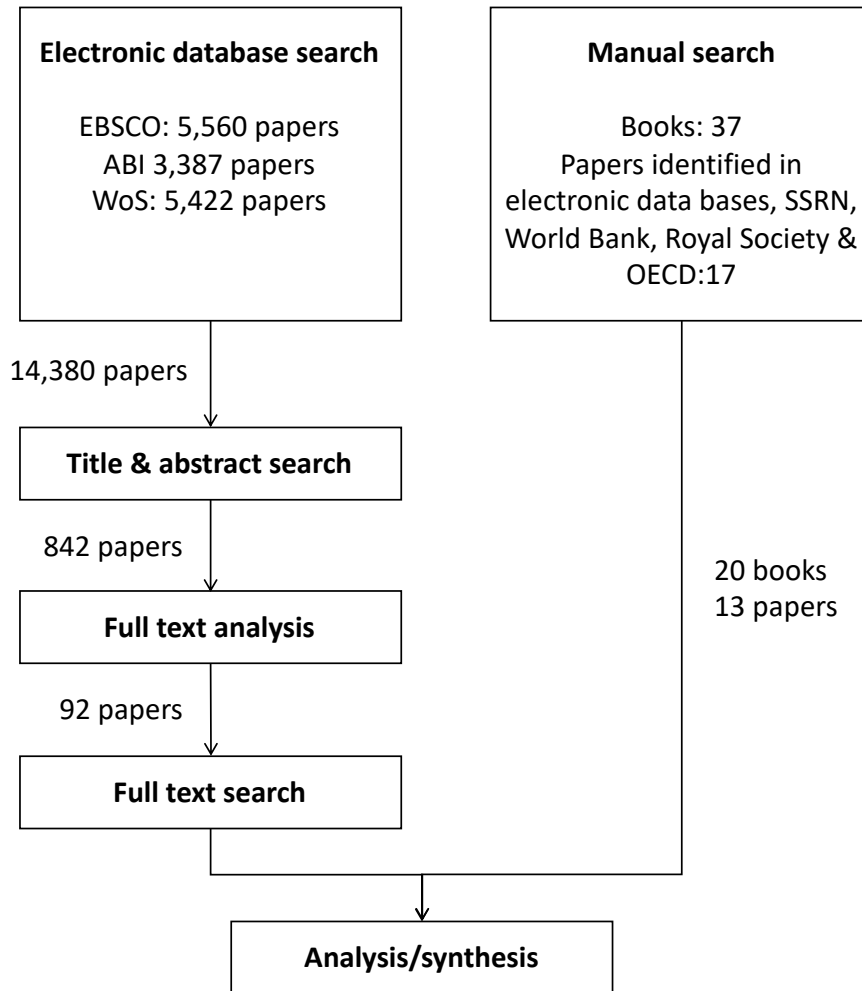


Figure 2-2 Search strategy

2.1.2.3 Study selection/evaluation

Six search strings were designed (Appendix B) using keywords identified in a scoping exercise. Searches were conducted in the form [search strings 1 + (2 or 3 or 4) + (5 or 6)]. The review was bound in the period 1970-December 2016, chosen to capture studies undertaken during the decline of the liberal social contract and the emergence of market-oriented variants (Martin, 2003; Olssen and Peters, 2005). All national and disciplinary contexts were included.

A fitness-for-purpose approach to quality was adopted (Briner, Denyer and Rousseau, 2009), whereby quality appraisal was subordinated to relevance of papers in contributing to synthesis and understanding of the research problem

(Pawson, 2006). Studies were included if they specified a tension in a research impact context. In order to establish generalisability and reliability of findings (Tranfield, Denyer and Smart, 2003), quality was evaluated after selection, using the Chartered Association of Business Schools (CABS) journal ranking as a proxy indicator of quality.

2.1.2.4 Analysis/synthesis

A framework synthetic approach (Adams et al., 2016), a matrix-based technique for data analysis involving the *a priori* construction of thematic categories into which data can be coded, was adopted for analysis.

2.1.2.5 Reporting/using results

The shortlist of 105 papers was widely distributed among 67 journals, with a concentration in Research Policy (13) and Higher Education (8). Evaluation of quality using the 2018 CABS journal rankings guide as a proxy showed high variability. Nineteen studies came from journals rated 4*, four from journals rated 4, eight from journals rated 3, thirty-six from journals with a rating of 2, five from those rated 1 and remaining thirty-three were unranked. There has been increasing attention paid to the exploration of impact tensions since 1993, with the majority of papers published from 2010 onwards. The majority of papers (70) were set within neoliberal states such as the US (26) or UK (24).

Neocorporatist states characterised by social partnership (18) such as Germany or Sweden, and technocratic dirigist states (16) such as China, Japan or France were sparsely represented (Fougner, 2006).

This process resulted in the identification of 30 tensions. The employment of theoretical sampling, described in Section 4.2.7, during data analysis led to the identification of another 15 known tensions and the proposition of a further 4 (Table 2-1).

Table 2-1 Impact-related tensions

Domain	Tension	Description	Evidence	Reference
SPIS	Neutrality – bias ³	World viewed as fully explicable and characterisable in terms of an underlying order or as a projection of individual imagination	Inferred	(Lacey, 1999, pp.3–4)
	Impartiality – partiality ¹	Extent to which the influence of norms, values, desires or interests upon choice of methods and theories is permissible	Conceptual	(Bourdieu, 1975; Lacey, 1999, pp.4–5)
	Fact – value ²	The superiority of scientific knowledge creation over subjective value judgement	Conceptual, empirical	(Putnam, 2002, pp.15–30)
	Authority – autonomy ¹	Representations of the relationship of science to society as both independent of social, ethical and political values and as the predominant source of knowledge creation	Conceptual	(Douglas, 2009, pp.3–8)
	Uncertainty paradox ²	On one hand, increasingly recognised that science cannot provide decisive evidence on uncertain risks, while on the other hand policymakers and authorities increasingly resort to science for more certainty and conclusive evidence	Conceptual	(van Asselt and Vos, 2007)
	Paradox of scientific authority ²	Concerns the legitimating function of scientific knowledge in the political arena and the delegitimating function of scientific knowledge which might mobilise the public against powerful economic and political interests	Conceptual	(Weingart, 1999)
	Autonomy – heteronomy ¹	Extent to which external influence upon academic action is permissible	Conceptual	(Bourdieu, 1997; Hackett, 1990; Lacey, 1999, pp.9–10; Mulkay, 1969)
	Convergent – divergent thinking ¹	Modes of thought involving acceptance of a consensus understanding of the world or critical examination of self-evident “facts” and exploration of unlikely possibilities	Conceptual	(Kuhn, 1977)

Domain	Tension	Description	Evidence	Reference
SPIS	Fragmentation – unification ²	The degree of pluralism in decision making and the self-reinforcing processes within a field which encourages knowledge exploration or exploitation respectively	Conceptual	(Knudsen, 2002)
STS	Communalism – proprietary ¹	Extent to which exclusive ownership and property rights of scientific knowledge held by its creators is permissible	Conceptual, empirical	(Merton, 1973, pp.273–275; Mitroff, 1974; Ziman, 1996)
	Universalism – particularism ¹	Extent to which truth claims are subject to personal or social attributes of their protagonist	Conceptual, empirical	(Merton, 1973, pp.270–273; Mitroff, 1974)
	Universalism – localism ¹	Preferences for knowledge creation for the purpose of unity of knowledge or contextualised problem solving	Conceptual, empirical	(Merton, 1973, pp.270–273; Ziman, 1996)
	Disinterestedness –interestedness/ authoritarian ¹	Extent to which peer expectations permit scientists to obtain financial, emotional or social rewards	Conceptual, empirical	(Merton, 1973, pp.275–277; Mitroff, 1974; Ziman, 1996)
	Originality – humility ¹	Extent to which peer expectations permit scientists to claim reputational reward	Conceptual	(Merton, 1973, p.293,303-305)
	Originality – commissioned ¹	Extent to which knowledge creation is directed towards utility and social robustness or novelty and scientific reliability	Conceptual, empirical	(Hackett, 2005; Merton, 1973, p.293,303-305; Ziman, 1996)

Domain	Tension	Description	Evidence	Reference
STS	Organised scepticism – dogmatism/ expert ¹	Extent to which beliefs are subject to empirical and logical scrutiny or locally valid expertise	Conceptual	(Merton, 1973, pp.275–277; Mitroff, 1974; Ziman, 1996)
	Ostensive – performative ²	Contradictions between expectations for how actors account for performance and actual performances experienced by specific people at specific times and places	Conceptual, empirical	(Feldman, 2000; Gond et al., 2016; Latour, 1986; Pentland and Feldman, 2008)
	Risk – uncertainty ¹	Choice of research goals and efforts to create a social identity or reputation within a field in order to maximise reward while mitigating risk	Conceptual, empirical	(Hackett, 2005; Kuhn, 1977, pp.321–322)
	Disciplinarity – interdisciplinarity ¹	The use of tools, methods, procedures, exempla, concepts and theories either from a single discipline or from a number of disciplines to address a research problem	Conceptual, empirical	(Klein, 1990, p.106)
	Individualism – collectivism ²	Concerns disharmony created by the choice of actions that will benefit individual interests over actions that will benefit the collective	Conceptual, empirical	(Giddens, 1991, p.20,131; Hofstede, 1980, pp.225–255; Parsons and Shils, 1951, pp.80–81)
	Calling – employment ¹	Competing motivations to undertake a career in science as serving a purpose worthy of personal sacrifice or as contractual employment	Conceptual, empirical	(Anderson et al., 2010)
	Breadth – narrowness ¹	Inconsistent role identities as researcher, teacher, administrator and for service to the profession, institution and society	Conceptual, empirical	(Anderson et al., 2010; Hackett, 1990)

Domain	Tension	Description	Evidence	Reference
STS	Quality – quantity ¹	Competing values associated with the evaluation of research in terms of volume and rapidity or quality	Conceptual, empirical	(Hackett, 1990)
	Competition – cooperation ¹	Conflict between the norms or values of open science (communalism) and commercialised science (interestedness)	Conceptual, empirical	(Hackett, 1990)
	Team obligations – community obligations ¹	The need for research group leaders to balance obligations to group members against those to the wider research community in terms of distribution of credit	Conceptual, empirical	(Hackett, 2005),
	Freedom – dirigisme ¹	The importance of freedom and self-determination for creative scientific work versus accountability for resources and explicit direction of scientific work	Conceptual, empirical	(Hackett, 1990)
	Basic – applied ¹	The privileging of basic research as a political symbol representing various identifications, expectations and demands related to science policy among scientists and politicians	Conceptual, empirical	(Latour, 1987, p.117; Pielke, 2012; Schauz, 2014)
	Rigour – relevance ¹	Competing rhetorics championing the legitimacy of practical relevance of research versus the threat to research quality this may entail	Conceptual, empirical	(Tranfield and Starkey, 1998)
	Global – local ¹	The geographic scale at which economic processes occur and where power lies	Conceptual, empirical	(Dicken, 1994)
	Nation state – competition state ¹	Policy goals to balance social justice and global competitiveness	Conceptual	(Cerny, 1997)
	Protective state – productive state ¹	Selection and enforcement of rules concerning rights and claims, and enablement of exchange between actors within these rules	Conceptual	(Buchanan, 1975)
	Public – private ¹	Competing imperatives for the socialisation or privatisation of knowledge and information	Conceptual	(Rappert, 1995)

Domain	Tension	Description	Evidence	Reference
STS	Internal – external orientation ²	Preference for organisational focus ranging from internal & person-oriented to external and organisation oriented	Conceptual, empirical	(Kleijnen et al., 2009; Quinn and Rohrbaugh, 1981)
	Centralisation – decentralisation	Adoption of activity configurations that are internally consistent and/or appropriate to the external environment	Conceptual	(Siggelkow and Levinthal, 2003)
	Control – flexibility ²	Preferences for organisational structure emphasising the adoption of strict work rules and adherence to tradition and sense of professionalism or experimentation, innovation and risk taking respectively	Conceptual, empirical	(Kleijnen et al., 2009; Quinn and Rohrbaugh, 1981)
	Organisational means – end ²	Concern for organisational outcomes (ends) or the manner in which ends are achieved (means)	Conceptual, empirical	(Kleijnen et al., 2009; Pentland and Feldman, 2008; Quinn and Rohrbaugh, 1981)
	Efficiency – effectiveness ¹	Competing demands that research and teaching be effective (i.e. of good quality) and efficient (performed within budget and to schedule)		(Hackett, 1990)
Innovation studies	Performing tension ¹	Stemming from contradictory demands of multiple stakeholders and resulting in competing organisational strategies and goals	Conceptual, empirical	(Bartunek and Rynes, 2014; Dasgupta and David, 1994; Smith and Lewis, 2011)
	Collaboration – control ¹	The degree to which governance adopts a collaborative or controlling orientation	Conceptual, empirical	(Sundaramurthy and Lewis, 2003)
	Knowledge exploration – exploitation ¹	In the context of organisational learning, the allocation of resources between exploration of new possibilities and the exploitation of old certainties	Conceptual, empirical	(March, 1991; Smith and Tushman, 2005)

Domain	Tension	Description	Evidence	Reference
Innovation studies	Responsibility – authority ¹	Contradictions between role responsibilities of scientists and their general responsibilities as human moral agents, which if neglected lead to loss of autonomy	Conceptual	(Douglas, 2003)
	Subjective – instrumental value ²	Extent to which value is held to be conferred on resources by the subjective preferences of agents during exchange rather than by objective factors synonymous with continuity of human experience	Inferred	(Ayres, 1944; Menger, 1976, p.220; Tool, 2000)
	Insider – outsider ²	Extent to which access to knowledge is withheld based upon identity or cost-benefit instrumentality	Conceptual	(Merton, 1972)
	Cohesive – diverse relationships ²	Competing tendencies towards network cohesiveness (homogeneity) and diversity (heterogeneity) in terms of experiential and demographic backgrounds of actors	Conceptual, empirical	(Jarvenpaa and Wernick, 2011)
	Nodal proximity – distance ³	Extent to which closeness along any dimension of proximity affects impact	Inferred	None
	Value creation – value capture ²	Contradictory imperatives to be open in order to leverage the knowledge of diverse contributors and to adopt protective attitudes to capture returns from their innovative ideas	Conceptual, empirical	(Chesbrough, Lettl and Ritter, 2018; Laursen and Salter, 2014)
	Determined – emergent organising ²	Competing tendencies within a network towards freedom, autonomy, passion, self-management, proactivity and flexibility on one hand, and control, discipline, problem anticipation and planning on the other	Conceptual, empirical	(Jarvenpaa and Wernick, 2011)
	Past – future temporal orientation ²	Conflicts between strategic and habitual agency	Conceptual, empirical	(Embirbayer and Micshe, 1998; Granqvist and Gustafsson, 2016)
	Present – future temporal orientation ³	Conflicts between strategic and sensemaking agency	Inferred	None

Domain	Tension	Description	Evidence	Reference
Innovation studies	Present – past temporal orientation ³	Conflicts between sensemaking and habitual agency	Inferred	None

¹ Identified through initial systematic and manual literature reviews

² Identified through subsequent theoretical sampling

³ Identified through empirical observation

2.1.3 Science, policy and innovation studies perspectives

SPIS has been defined as being “devoted to analyzing, understanding and effectively responding to the economic, policy, management, organizational, environmental and other challenges posed by innovation, technology, R&D and science” (Martin, 2012). Topics of interest include the creation of knowledge (through research), the diffusion, acquisition and exploitation of knowledge in the form of new or improved products, processes or services. Various disciplines contribute to the field, including economics and economic history, policy studies, philosophy and history of science, management science, organisational studies and sociology (though Martin considers sociology of science to be part of STS).

A central theme within SPIS is the “social contract for science”, the implicit agreement and set of mutual expectations between science and the state wherein government funds and cedes authority to the scientific community in questions of what work should be done in return for the production of scientifically-reliable knowledge (Martin, 2003, p.7). Various authors have claimed that the social contract is in flux within many countries, driven by increased multipolar global competitiveness, constraints on public expenditure and technological advances (Guston and Keniston, 1994; Martin, 2003; Olssen and Peters, 2005). This sees the liberal social contract, emphasising high levels of public funding and academic freedom, and directed towards production of scientifically-reliable knowledge, being displaced by a globalised and neoliberal model, emphasising national and market competitiveness as a rationale for academic research, and production of “socially robust” knowledge (Gibbons, 1999) directed towards specific societal benefits. Many of the tensions discussed in this section are associated with this shift.

2.1.3.1 Neutrality – bias

Neutrality (Lacey, 1999, pp.3–4) is an epistemic value which underpins objectivist or realist ontological perspectives. Neutrality holds that the world is

fully explicable and characterisable in terms of an underlying order, can be characterised in quantitative terms and can be explained through laws and equations, all ontologically independent of human inquiry, perception and action. A tension between neutrality and its antonym “bias” concerns contradictions with an alternative, socially constructed worldview, explicable and characterisable as a projection of individual imagination and therefore dependent on human perception and interpretation.

Neutrality-bias has not been formally conceptualised as a tension in the literature but is implicit in epistemological characterisations of science. These describe a structural dimension in terms of the division of academic labour between quantitative-descriptive and qualitative-interpretive schools (Rayner and Malone, 1998, p.31) which have dominated Western science since the Enlightenment. They also have symbolic and normative dimensions in terms of distinctive approaches to what is taken to constitute truth in either school (Kagan, 2009, p.40) and to subject matter and research practice. Integration of insights between schools is rare (Lincoln and Guba, 2000).

2.1.3.2 Impartiality – partiality

Impartiality is an epistemic value that holds that only what is observable and certified by replication and agreement, independent of desires, value perspectives, cultural and institutional norms and presuppositions, or stakeholder interests, can properly serve as evidence for scientific claims and theories (Lacey, 1999, pp.4–5). Impartiality is a foundation of Baconian empiricism, which was developed in opposition to the early modern University’s self-referential Aquinas–Aristotelian model of knowledge, and for the purposes of advancement of the economic well-being of the state (Bhattacharya, 2012; Delanty, 1998).

However, Bourdieu (1975) argues that the definition of science (the delimitation of the problems, methods and theories regarded as scientific within a field) is the subject of a value-laden struggle for scientific authority by competitors within

that field. As a consequence, “antinomies of legitimacy” arise, whereby actors compete in the struggle for authority by seeking to establish that their research and scientific capacities constitutes the most accomplished, legitimate and transcendent realisation of science. These antinomies of legitimacy represent the conceptualisation of an impartiality-partiality tension, defined as the extent to which the influence of norms, values, desires or interests upon choice of methods and theories is permissible. Partiality holds that, as reality is a historically, socially, and/or linguistically situated experience with multiple possible truths, then controlling the definition of science by seeking authority and establishing legitimacy within a field is permissible. No empirical accounts of a partiality-impartiality tension were identified in the literature.

2.1.3.3 Autonomy-related tensions

Lacey’s third and final epistemic value is autonomy (1999, pp.9–10), regarding self-governance in relation to problem definition, determining qualifications for community membership and the scientific practices and institutions in which theories are generated, tested and evaluated. It is held to serve as a condition for gaining impartiality of theoretical appraisal and neutrality of theoretical claims. From the medieval University to today, separate and sometimes competing notions of autonomy have emerged at institutional, professional and individual levels (Berdahl, 1990; Miller, 2014).

Several tensions associated with autonomy have been identified in the literature, and these are structured using Gauchat and Andrews’ (2018) three forms of scientific authority. First, general scientific authority concerns the privileging of scientific knowledge over other forms of knowledge creation. This view of the superiority of scientific knowledge creation over subjective value judgement, which Putnam (2002, pp.15–30) calls a **fact-value dichotomy**, became influential first within the social sciences and subsequently throughout society. Putnam actually rejects this dichotomy, arguing that facts and values are “entangled” in many ways, such as that certain facts only come into view through an evaluative frame. Nonetheless, the decline of public confidence in

the scientific community in the US, particularly among those who share a conservative identity, is significant (Gauchat, 2015).

Second, autonomous authority concerns a disinterest in socially dominant underpins audiences outside the profession and field of scientific knowledge production. This results from an exclusionary tension, where the requirements for participation in scientific decision-making are higher than for democratic decision-making (Guston and Keniston, 1994, p.27). This is most commonly expressed in terms of the “value-free” ideal of science (Lacey, 1999, p.1), an important component of scientific self-image which holds that social, ethical and political values should have no influence over scientific reasoning or practice. However, Douglas (2009, pp.3–8) argues that this representation of the science/society relationship is in intolerable tension with general scientific authority which, if simultaneously maintained, would grant science too much power with no attendant responsibility. This **authority-autonomy tension** Merton’s ethos of science (1973, pp.273–305), developed as a response to *rassenhygiene* (eugenics) and Axis powers’ medical experiments (Roelcke, 2004). More recently, it may be associated with Sen’s (2001) critique of classical economic theory and its emphasis on economic rather than welfare measures, and in the growing concern (Ràfols and Yegros, 2017; UN, 2016) regarding research equity [whether research is achieving specific goals, reaching certain beneficiaries, or addressing specific health needs (Hinrichs-Krapels and Grant, 2016)].

Two other identified tensions may be considered as representations of authority-autonomy. The uncertainty paradox involves, on one hand, the increasing recognition that science cannot provide decisive evidence on uncertain risks, and on the other hand, the increasing dependance of policy-makers and authorities on science for more certainty and conclusive evidence (van Asselt and Vos, 2007). The paradox of scientific authority (Weingart, 1999) sees policy makers increasingly seek scientific advice while at the same time increasingly question this advice.

Third, heteronomous authority concerns the compatibility of science with dominant interests in economic and political centers of power. Bourdieu (1983) acknowledged a dual basis for this autonomy in which scientists are permanently negotiating the terms of their independence from external authorities while being dependent upon their economic or political power. This dynamic “dependence in independence (or vice versa)” (Bourdieu, 1997), rather than a simple dichotomy, constitutes an **autonomy-heteronomy** tension, which is defined here as the extent to which external influence upon academic action is permissible. This is typically employed conceptually in terms of an inevitable shift towards academic heteronomy as a consequence of market imperatives and state controls, with the introduction of the impact metric itself serving as an example, though empirical studies were also identified (Benner and Sandström, 2000; Hicks, 2012; Lehrer, Nell and Gärber, 2009; Mintrom, 2009). Braun (2003) implicitly explores the tension and its implications for funding policy. Others have proposed similar tensions, such as Mulkey’s (1969) individualism-independence dualism and Hackett’s (1990) tension between freedom and autonomy versus accountability and dirigisme.

2.1.3.4 Convergent – divergent thinking

Polanyi (1962), and later Kuhn (1977, pp.226–227), identified a tension between divergent and convergent modes of thought which ensures scientific fields remain progressive by enabling a consensus understanding to be built upon, and through critical examination of “self-evident facts” enabling consensus to be torn down and replaced if necessary. Tranfield and Starkey (1998) characterise convergent disciplines as exhibiting a sense of togetherness, shared purpose, ideology and values which become manifest in shared quality judgements, a sense of community, well-defended boundaries and low tolerance of deviance, while divergent disciplines display the obverse. New scientific fields exhibit divergent search regimes, i.e. dynamic patterns of fruitfulness in which each conclusion generates further hypotheses and research programmes (Bonaccorsi, 2008). Others have identified related tensions, which

may be considered instantiations of convergent-divergent thinking. Knudsen's (2002) fragmentation-unification tension refers to the balance between knowledge exploration and exploitation which must be maintained to keep fields progressive. Hackett (2005) offered empirical evidence of an insecurity-familiarity tension, referring to the insecurity experienced by academics facing the development of new skills and technologies and the prospect of losing embodied judgment based on existing skills and knowledge.

2.1.4 Science and technology studies perspectives

STS is the study of how society, politics, and culture affect scientific research and technological innovation, and how these, in turn, affect society, politics and culture (Martin, Nightingale and Yegros-Yegros, 2012). According to these authors, STS literature consists of three distinct clusters: technology, power and politics, sociology of science and of scientific knowledge, and scientometrics. The field draws from sociology, management, business, economics, operations research, engineering, information, library and computer science, and history and philosophy of science.

A key theme drawn from STS is Merton's (1973, pp.273–305) seminal work identifying five norms of academic science. However, it has been argued that this normative structure is often misrepresented as a simplistic caricature in subsequent literature (Panofsky, 2010, p.140), a trend Merton himself noted (Merton and Barber, 1976, pp.56–64). Merton viewed his norms as constituents of an ethos of science, a historically situated process comprised of oppositional norm/counter-norm tensions and contingent local circumstances which alternately governed academic behaviour through a process of sociological ambivalence (Arribas-Ayllon and Bartlett, 2014; Merton, 1976). Others have seen them as professed norms (essentially a legitimising strategy aimed at non-academic out-groups) rather than as statistical norms (patterns of positively sanctioned activity) (Barnes and Dolby, 1970).

2.1.4.1 Communalism – proprietary

Merton (1973, pp.273–275) identified communism (or communalism) as a norm concerning the constituting of the substantive findings of science as a common heritage assigned to the scientific community. Consequentially, the sole property rights granted to the individual producer of scientific knowledge are limited to recognition and esteem. Various suggestions have been proposed for a counternorm to communalism where science is functional to application to real world problems rather than the extension of certified knowledge. Mitroff (1974) suggested solitariness or miserism, holding that property rights are expanded to include protective control over the disposition of one's discoveries, with secrecy subsequently considered a necessary moral act. Ziman's (1996) norm of proprietary is broadly similar, and a consequence of knowledge being created within Mode 2 (Gibbons et al., 1994) networks, consisting of both academics and non-academics.

Communalism is typically associated with the “public good” model of knowledge, as opposed to an academic capitalist model (Baycan and Stough, 2012). Etzkowitz (2011) argues that communalism has been at least partially displaced due to an emphasis on impact as a third mission of the university. This claim is supported by Cooper's (2009) finding of a general shift away from science for public to private goods, at least among US biological scientists. However, it has been shown that subscription to a communalism norm only makes interaction with industry less likely in terms of paid consultancy or working with industry in an entrepreneurial capacity, but not bidirectional knowledge transfer, student placements, co-patenting or co-authorship (Boardman and Ponomariov, 2009). Further, common perceptions of a publish or patent dilemma may be a false dichotomy, not explaining patenting behaviour (Provasi, Squazzoni and Tosio, 2012) and being seen as problematic less by highly productive scientists and more by those of low productivity and research council grant holders (Davis, Larsen and Lotz, 2011). Indeed, it has been shown that academic patents assigned to non-profit organisations are complimentary to publication quantity and quality, although those assigned to corporations are negatively related (Czarnitzki, Glänzel and Hussinger, 2009).

2.1.4.2 Universalism related tensions

Merton's (1973, pp.270–273) norm of universalism holds that truth claims are to be subjected to preestablished impersonal criteria, and the acceptance or rejection of claims is independent of personal or social attributes of their protagonist, such as race, nationality, religion, status or class. As a norm, universalism may be considered as related to the value of impartiality, but distinguishable in that values are generally independent of specific situations while norms are more or less specific rules for behaving in given circumstances (Lacey, 1999). Mitroff (1974) suggested a counternorm of particularism, whereby the social and psychological characteristics of the scientist are regarded as important factors in how their research is judged. Thus, a **universalism-particularism** tension is defined as the extent to which truth claims are subject to personal or social attributes of their protagonist.

According to Kuhn (1996), research activities and outcomes vary as a function of a scientific field's level of maturity, and therefore evaluation of a scientific contribution on universalistic standards (e.g. the quality of ideas, precocity, citations, journal quality, author order) may be less important in immature fields than on particularistic standards (e.g., pedigree, advisor reputation, social networks, gender). Empirically, universalistic factors were found to have a greater effect on research outcomes than particularistic factors in the strategy subspecialty (Boyd, Finkelstein and Gove, 2005), while particularistic factors were more apparent within political science than chemistry (Pfeffer, Leong and Strehl, 1977).

A second universalism tension is **universalism-localism**, where localism is a counternorm conceptualising knowledge as being created for the purpose of solving problems within local contexts and not shaped by a preference for unity of knowledge and generality (Ziman, 1996). No explicit empirical explorations of the universalism-localism tension were identified. However, there is significant empirical evidence showing that in research intensive US universities (Owen-Smith, 2003; Powell and Owen-Smith, 1998) and within US and UK

biotechnology (Lynskey, 2006; Vallas and Kleinman, 2008), a blurring in the division of labour and an integration of success standards has taken place between academic and commercial science, suggesting this tension is in flux. Furthermore, publication and invention activities of academics have been found to coexist and potentially reinforce each other (van Looy, Callaert and Debackere, 2006).

2.1.4.3 Disinterestedness – interestedness/authoritarian

Merton's (1973, pp.275–277) norm of disinterestedness refers to a pattern of institutional control concerning peer expectations of scientist behaviour (Tuunainen and Knuuttila, 2008, p.140). This expectation is that scientists should perform research without the expectation of obtaining financial, emotional or social rewards, thereby safeguarding against fraud in science (Barber, 1952; Barnes and Dolby, 1970). Ziman (1996) argued that this was unrealistic and proposed the counternorm of authoritarian, an expectation for socioeconomic power to act as the final authority in knowledge creation. Mitroff's (1974) counternorm of interestedness is similar, concerning the expectation that scientists should achieve self-interest in work satisfaction and prestige through serving communities of interest rather than the scientific community.

Disinterestedness is the second of two norms which Etzkowitz (2011) claims has been partially displaced due to the current emphasis on the third mission. It has been shown that subscription to a disinterestedness norm negatively affects the likelihood of most forms of interaction with industry (Boardman and Ponomariov, 2009). However, academics have diverse motivations to engage in commercialisation activities (Lam, 2011) and pecuniary motivations have been found to be outweighed by the desire to further research among both UK and Italian scientists (D'Este and Perkmann, 2010; Tartari and Breschi, 2012).

2.1.4.4 Originality related tensions

Merton (1973, pp.293, 303–305) describes a tension within science between the norms of originality and humility. Science advances through originality in terms of new insights with recognition of one's priority, however humility leads to an insistence of how little one has been able to accomplish. Thus, an **originality-humility** tension concerns the extent to which peer expectations permit scientists to claim reputational reward. No empirical explorations of the originality-humility tension were identified. However, humility as the practice of remaining open to discovering that our knowledge is partial and evolving has been associated with self-reflection and a schema of taking an attitude of inquiry in research (Marshall et al., 2007).

A second tension involving originality was proposed by Ziman (1996) who argued that this norm is displaced by a counternorm of commissioned, whereby research is based on external commission aimed at practical utility rather than the extension of certified knowledge. The **originality-commissioned** tension concerns the extent to which knowledge creation is directed towards utility and social robustness (Gibbons, 1999) or novelty and scientific reliability. A small number of empirical explorations of this tension were identified (Sanders and Miller, 2010; Smith-Doerr and Vardi, 2015; Swan et al., 2010). More broadly, an ongoing shift in legitimisation strategies in science, technology and innovation policies suggests that conceptualisations of “commissioned” are changing (Flink and Kaldewey, 2018). During the latter half of the 20th century, legitimisation strategies emphasised scientific knowledge transferability and problem solving. There is no doubt that significant amounts of these activities occur annually in the UK (HESA, 2019) and problem solving is regarded as a key role of UK universities (Hughes, 2011). However, that such strategies have not questioned the relevance of scientific knowledge production is now being challenged. Increasingly, problem choice is being considered as important as problem solution, particularly in grand challenges and transdisciplinary research (Klein, 2003). However, while transdisciplinary research may produce socially robust knowledge, this may not necessarily result in the ability to influence societal change in a sustainable direction (Polk, 2014). This suggests that

political processes of negotiation of interests and trade-offs under conditions of conflicting interests between stakeholders have not been successfully incorporated into academic knowledge transformation processes (Carlile, 2004; van de Ven and Johnson, 2006).

2.1.4.5 Organised scepticism – dogmatism/expert

Organised scepticism (Merton, 1973, pp.275–277) is a norm concerning the detached scrutiny of beliefs in terms of empirical and logical criteria, and the temporary suspension of judgement by the scientific community until such scrutiny can be undertaken. Mitroff (1974) proposed a counternorm of organised dogmatism, wherein the scientist is convinced of the veracity of their own findings while doubting those of others. Ziman (1996) argued that acceptability of research findings in a Mode 2 context is based upon development of a particular and locally valid expertise rather than organised scepticism, proposing a counternorm of expert. Thus, an organised scepticism-organised dogmatism or expert tension concerns the extent to which beliefs are subject to empirical and logical scrutiny or locally valid expertise.

No explicit empirical explorations of the organised scepticism-dogmatism/expert tension were identified. More broadly in terms of expert knowledge, the role of situated practice in the process of learning and knowledge generation has been explored in the communities of practice literature (Amin and Roberts, 2008; Cox, 2005; Soekijad, Huis and Enserink, 2004), where CoPs are defined as learning groups in which new insights can be transformed into knowledge through mutual engagement around a joint enterprise (Wenger, 1998, p.214). Scientific misconduct has been associated with organised scepticism (and implicitly, dogmatism) (Bornmann, Nast and Daniel, 2008; Fox, 1994).

2.1.4.6 Ostensive – performative

An ostensive-performative tension (Feldman, 2000; Latour, 1986) concerns contradictions between expectations for how actors account for performance

and actual performances experienced by specific people at specific times and places (Pentland and Feldman, 2005). At least two dimensions of this tension are relevant to an impact context. The first concerns the ostensive model for how impact emerges from research, which appears to draw from the linear model of innovation (Godin, 2006). This model proposes that the path from research to impact may be represented as a series of sequential (rather than parallel or simultaneous) activities which proceed uni-directionally (sequential linearity), a clear division of labour along the sequence between academics and others who specialise in the various relevant stages, with no feedback loops between stages, and a chronological ordering of the direction of causation from research to impact (temporal linearity) (Balconi, Brusoni and Orsenigo, 2010). This model is a political symbol of academic authority and autonomy which caters for beliefs in stability, orderliness, and distinct social roles for scientists and others (Flink and Kaldewey, 2018).

During REF2014, although explicit guidance was issued to REF sub-panels to avoid linear thinking (Smith, Ward and House, 2011), the impact case study template may have channeled such thinking (Manville et al., 2014) and at least one sub-panel implicitly favoured case studies presenting linear and strategic narratives (Ní Mhurchú et al., 2017). This suggests that the ostensive model of impact has both cognitive (held as a schema) and material (embedded in the case study template) dimensions, although not necessarily structural (REF guidance).

The second dimension concerns selective appropriations of performativity wherein picking one element of a conceptualisation leads to a neglect of others (Gond et al., 2016). One illustration of this is the emphasis on direct practical and short-term utility of research for targeted groups of end users noted in REF (Donovan, 2008), regional innovation systems (Ramos-Vielba and Fernández-Esquinas, 2012) and triple helix systems (Meyer et al., 2013), although this serves as a poor indicator of more long-term societal benefits. Another illustration is REF's definition of impact as a measure of research effectiveness (whether research led to societal benefits). Neither research efficiency (how

productive the research system is and whether research is happening at an appropriate rate) or research equity were assessed (Hinrichs-Krapels and Grant, 2016).

2.1.4.7 Risk – uncertainty

Science is inherently risky in that there is no guaranteed return for investment of effort or capital (Lazonick and Mazzucato, 2013). A risk-uncertainty tension (Hackett, 2005) concerns the levels of risk that are knowingly or unknowingly accepted in research and impact, versus the level of uncertainty associated with how fruitful research is in terms of yielding scientific credibility, i.e. scientists' ability to do science (Latour and Woolgar, 1986, p.198). In empirical work, Hackett found that the risk-uncertainty tension was experienced differently at individual, group and field levels. Early career researchers may be risk adverse as they strive to establish a reputation in their field, but also have more time in their career to recover from unfruitful research avenues. Mid/late career researchers may be risk adverse for certain types of failure but have sufficient seniority and credibility accrued to engage in research outside their field and impact activities (Perkmann, Salter and Tartari, 2011). The risk profiles of research groups are shaped by interactions between scientists at different phases of the career and often a group maintains a mixed portfolio of projects in terms of levels of risk. At a field level, so-called "high risk-high reward" or "frontier" research is increasingly encouraged in public research funding programmes in the US and EU (Laudel and Gläser, 2014).

2.1.4.8 Disciplinary – interdisciplinary

Klein (1990, p.106) identifies as a paradox the impossibility of being both disciplinary and interdisciplinary. A discipline is defined as "the tools, methods, procedures, exempla, concepts and theories that account coherently for a set of objects or subjects" (ibid, p.104), while interdisciplinarity is an interactive process in which researchers work jointly, drawing from their own discipline-

specific perspective, to address a common research problem (Stokols et al., 2008). At one pole of this paradox is the perceived need for disciplines as a process for detecting error and distinguishing good work from bad, a source of instrumental and conceptual material for problem solving and a base for integration of knowledge. At the other, disciplinary behaviour and structure which lead to interdisciplinarity being viewed as a threat to the discipline. Weingart (2000, pp.25–41) argues that this is not a paradox, but a productive tension consisting of mutually reinforcing strategies of interdisciplinarity and disciplinary specialisation. A related tension is between the demand for research specialisation versus generalised learning (Hackett, 1990), associated with interdisciplinarity in the choice of assembling an interdependent team of specialists or synthesising disparate bodies of knowledge and techniques within a single actor.

Existing literature concerning interdisciplinarity is largely conceptual, with important contributions including its logics (Barry, Born and Weszkalnys, 2008), modes and barriers (Siedlok and Hibbert, 2014) and measurement (Wagner et al., 2011). Empirical explorations of interdisciplinary tensions are surprisingly rare, an example being Woelert and Millar's (2013) application of the paradox of interdisciplinarity to Australian research governance. However, tensions may be expected to emerge across normative, symbolic and structural dimensions of disciplines as identified by Buanes and Jentoft (2009). To illustrate, disciplines are continually and differentially constituted identity categories (Suchman, 2013, p.157), and engaging in interdisciplinarity risks challenge and change to one's disciplinary identity (Manathunga, 2009, p.133). Disciplines possess a set of norms (a communal tradition of procedures and techniques for dealing with theoretical or practical problems) (Toulmin, 1972, pp.139–142) and a core knowledge (a body of concepts, methods, and fundamental aims) which serves as a normative boundary instructing members what they can and cannot do (Klein, 1996, p.4). Finally, disciplines act as a source of authority by providing and disseminating a set of rules to govern behaviour (Barry and Born, 2013, p.1).

2.1.4.9 Individualism – collectivism

Giddens (1991, pp.20, 131) argues that two aspects of modernity, the separation of space and time, and disembedding mechanisms which sunder and reform social relations across space-time distances, break the hold of preestablished precepts and practices enabling the emergence of new self-identities and attitudes to collective circumstance. An individualism-collectivism tension thereby arises concerning how an individual relates to their collectives, or groups of individuals bound together by a number of different relationships (Earley and Gibson, 1998). Both Hofstede (1980, pp.225–255) and Parsons (Parsons and Shils, 1951, pp.80–81) view individualism-collectivism as concerning disharmony created by the choice of actions that will benefit individual interests over those of benefit to the collective. Collective orientations have permitted a variety of collective gains, such as knowledge aggregation, development of a shared history and protection of evolutionary adaptations, while individual orientations enable individuals to seek distinction or financial gain (Smith and Lewis, 2011).

The individualism-collectivism tension suggests a micro-level change, as an individual once part of a collective acts against its interests, for example by refusing to publish within a community. Although various mechanisms of institutional change have been identified at a micro level (Micelotta, Lounsbury and Greenwood, 2017), these emphasise why and how individuals engage in impact activities rather than subsequent disharmony within the collective. For example, academic institutional entrepreneurs have been found to possess different role identities and motivational goals to traditional academics (Lam, 2011), typically occupy high status positions within their fields (Perkmann, Salter and Tartari, 2011) and engage in entrepreneurship while acting in accordance with and defending the academic institutions to which they belong (Fini and Toschi, 2016; Lam, 2010; Rosa and Dawson, 2006). Academics involved in structural overlap, or contexts where previously distinct roles, structures and functions are forced into association (Thornton, Jones and Kury,

2005) engaged in various forms of academic-industry collaboration as a result of logics hybridisation within research centres (Lind, Styhre and Aaboen, 2013) and experienced shared cultural spaces which mitigated tensions (Bjerregaard, 2010). Academics responded to competing institutional logics by using compartmentalisation as a dominant coping strategy, publishing in separate outlets for different target audiences (Bullinger, Kieser and Schiller-Merkens, 2015).

The idea of an individual-collective tension also underpins Merton's theory of anomie (1968, pp.198-226), which sees collectives setting goals and behavioural norms from which individuals may deviate when they are unable to achieve the goals. Even before this, Hagstrom (1964) claimed that the growth and increased specialisation of scientific communities has led to anomie, an awareness of the absence of opportunities to achieve recognition through publication. It is only in recent years that empirical studies began to explore the heterogeneity of academic identity and departure from academic norms, but thusfar only in the context of academic entrepreneurship (Jain, George and Maltarich, 2009; Lam, 2011). These studies argue that the shift from an embedded liberal to a neoliberal institutional context of science has resulted in the emergence of a range of role identities, from traditional academic to entrepreneurial scientist and with ambivalent academic/commercial hybrids in between. Implicit in these perspectives is that while the relative prioritisation of institutional orders has shifted, the institutions themselves remain intact. A more radical interpretation, such as Beck's *Individualisierung* (Beck and Beck-Gernsheim, 2002) which is based not on the autarkic individualism of neoliberal economics but an anomic individualism, indeterminate, full of risk and precarious freedom, has not been explored.

2.1.4.10 Calling – employment

Anderson et al. (2010) proposed an empirically-derived normative tension of calling-employment concerning motivations to undertake a career in science. Scientists who regarded science as a calling viewed science as serving a

purpose worthy of personal sacrifice. Those who regarded science as employment stressed working in accordance with employment terms such as working hours, pay, benefits, and vacation time. No further empirical explorations of this tension were identified.

2.1.4.11 Breadth – narrowness

Various authors have argued that the shift from a liberal to a modern, technically rational model of the University has seen a separation of teaching and research (Delanty, 1998, 2001b; Habermas, 1989) and an increasing commoditisation of the former. Hackett (1990) suggests that this results in a values tension involving inconsistencies between the role identities of academics as student mentor and principal investigator (employer). Various empirical studies have explored a teaching-research tension. For example, Boyd and Smith (2016) have demonstrated how academics acknowledge the primacy of research but also subvert the research imperative by taking alternative career paths through teaching or administration. Faculties in various countries were found to believe that teaching and research are not mutually exclusive activities, although teaching does detrimentally impact research in terms of course load and student demand (Gottlieb and Keith, 1997).

Other duties of faculty, such as administration, outreach and impact, may also be detrimental to research. For example, Hackett's (2005) **craftwork-articulation** work tension concerns the exercise of technical versus administrative expertise experienced during the managing of a research team. For Anderson et al. (2010), these are incorporated into a larger normative tension of **breadth-narrowness**, concerning the degree of focus on research relative to competing academic roles identities as teacher, administrator and for service to the profession, institution and society. Empirically, it has been demonstrated that scientists exhibit dual motivations towards institutional and organisational goals (Glaser, 1963). Hackett (1990) referred to this tension as cosmopolitanism-localism, experienced by scientists in terms of competing conceptualisations of category membership and relational role.

2.1.4.12 Quality – quantity

Hackett (1990) identifies a quality-quantity tension concerning competing values associated with the evaluation of research. He argues that volume and rapidity of publishing, in addition to quality, have become important for a successful academic career and that this shift has served a bureaucratic need for quantitative performance standards applicable independently of scientists' substantive experience. Empirical support for this tension has been provided by Anderson, who reported that scientists expressed mixed opinions of the relative importance of quantity to quality (Anderson et al., 2010).

2.1.4.13 Competition – cooperation

Hackett (1990) argued that a displacement of cosmopolitanism by local influences (see Section 2.1.4.15) leads to the emergence of a competition-cooperation tension involving an erosion of commitment to the academic community as academics engage in career-threatening struggles for prestige and resources. Hackett (1990, 2005) claims this tension is values-based, suggesting the involvement of the norms of open science (communalism) and an instrumental science (interestedness). There is conflicting empirical evidence concerning responses to this tension. Significant levels of peer competitive behaviour, counter to an espoused norm of cooperation, were perceived by US scientists, leading to substantial normative dissonance and stress (Anderson, Martinson and de Vries, 2007). Competitive behaviour among Japanese scientists has seen a shift away from open science norms emphasising generalised exchange of scientific resources and towards commercialised science norms of direct exchange, with a reduction in overall sharing (Shibayama, 2015; Shibayama, Walsh and Baba, 2012). An acceptance in principle, but not in practice, of open data norms by economics and management academics has also been reported (Andreoli-Versbach and Mueller-Langer, 2014). Withholding of data or resources has been experienced by a significant percentage of US academics (Campbell et al., 2000), and

increased secrecy has been found to vary with discipline and form of knowledge exchange (Hong and Walsh, 2009).

2.1.4.14 Team obligations – community obligations

As research groups accrue credibility (Latour and Woolgar, 1986, p.198), various forms of scientific capital (money, data, prestige, credentials, problem areas, argument, papers etc) may be exchanged, shared, stolen, accumulated or wasted. Hackett (2005) empirically identified a tension whereby the moral economy of science compels leaders to balance obligations concerning scientific credibility to group members against those to the wider research community. An example of this tension concerns decisions about when to publish results as the effect of publication can be a rapid leveling of research advantage detrimental to the team's credibility. Lissoni and Montobbio found that ambiguity was necessary to temper tensions within teams caused by the impossibility of contribution-based credit allocation (Lissoni and Montobbio, 2015).

2.1.4.15 Cosmopolitan tensions

Cosmopolitanism is described as “a manifestation of the mentality of the global elite, as world citizenship, as a politics of human rights, as a religion of humanity and as global mores” (Ossewaarde, 2007). Its predominant form, liberal cosmopolitanism, has often been set in what Calhoun (2003) refers to as a false (i.e. ideological) opposition to particularism or localism, a concern with a particular community or group of communities. Within the context of science, this tension concerns competing ideas of production, function and organisation between a predominantly nationally organised scientific research base and an increasingly globalised scientific community (Delanty, 2001a, p.129). In particular, the cosmopolitan emphasis on the inherent value of knowledge, free and critical thinking, and disciplinary integrity often conflicts with managerial (emphasising performance indicators and league tables, quality assurance

processes, standardisation of practices and the rhetoric of employability) and consumerist (emphasising student satisfaction and production of commercialisable knowledge) models of the University (Byrne and Bond, 2014). However, such debates have been criticised for considering cosmopolitanism as a value while neglecting a grounding of this tension in social relations (Pendenza, 2017).

According to Delanty (2001a, pp.26–43, 128–129), two types of cosmopolitan tensions have emerged in the context of the relationship between academia and state. The first involves conflict between a legitimising idea of the University as the primary site of emancipatory knowledge production and attempts by the nation state to impose upon the academic community new “epistemic regimes” (Wittrock, 1993, p.342), such as cognitive and regulative systems designed to encourage production of productive knowledge. This may result in a populist tension (Guston and Keniston, 1994, pp.26–28) whereby democratic policies reflecting popular tastes and preferences are antagonistic towards scientific practice. Academics experience this as a **freedom-dirigisme** tension (Hackett, 1990), defined as the importance of freedom and self-determination for creative scientific work versus accountability for resources and explicit direction of scientific work. An example is the introduction of impact itself, to which UK academics reacted with ambivalence with regards to REF but broad acceptance as a research funding criterion (Holt, Goulding and Akintoye, 2014).

Two instantiations of this tension are worthy of note due to their prevalence in the literature. The first is **basic-applied**, concerning competing research motives to understand or control the natural world (Snow, 1959). It has been argued that basic and applied research do not represent actual research practices or relations between scientists and other actors (Beesley, 2003; Latour, 1987, p.117; Lynskey, 2006) Nonetheless, basic research is often invoked as a political symbol representing various identifications, expectations and demands related to science policy among scientists and politicians, where it is separated from an “inferior” applied research by a discursive boundary (Lee,

1998; Pielke, 2012; Schauz, 2014). This tension was implicit in the adoption of commercial legitimisation narratives by US academic leaders in the 1980s (Slaughter, 1993) and more recently in the European Commission's decision to fund "frontier research" in Framework Programme 7, reversing a trend of not funding basic research (Flink and Kaldewey, 2018).

The second instantiation is **rigour-relevance**, described as a rhetoric that seeks to discipline business and management academics in directions that would deflect them from sustaining an independently critical, rather than a captured and subordinate, relationship to their subject matter (Knights, 2008), or involving the legitimacy of scientifically rigorous academic research versus the perceived need for relevance on the part of practitioners (Tranfield and Starkey, 1998). An anti-performative stance holds that academic rigour and practitioner relevance are almost mutually exclusive due to the autopoietic self-referential nature of social systems (Daft and Lewin, 2008; Kieser and Leiner, 2009; Rasche and Behnam, 2009). A performative perspective sees perceptions of "valid knowledge" shifting from academically confirmed and codified knowledge to more egalitarian and transient, shared knowledge within the knowledge economy (Williams, 2007). Empirical studies have focussed on ways of bridging the rigour-relevance gap through the use of "trading zones" (Romme et al., 2015), "bridging knowledge" (Baycan and Stough, 2012; Hodgkinson and Rousseau, 2009), evaluation criteria (Nicolai, Schulz and Gobel, 2011; Richter and Hostettler, 2015), Modes 2 and 3 knowledge production (Gibbons et al., 1994; Huff and Huff, 2001; Knights and Scarbrough, 2010), and engaged scholarship (van de Ven and Johnson, 2006). A recent review of the practical relevance of management research has been carried out (Kieser, Nicolai and Seidl, 2015).

The second type of cosmopolitan-local tension arises as a consequence of the increasing importance of place-oriented (attachment to neighborhood, city, town, region) relative to nation-oriented localism (attachment to nation states) (Haller and Roudometof, 2010; Roudometof and Haller, 2007). This increasing importance is a consequence of the waning of the "rising tide hypothesis" (that

improvements in the general economy benefits all participants) (Stiglitz, 2016) in policy discourse and the incorporation of smart specialisation innovation policies emphasising “place-based” competitive advantage within the EU (Landabaso, 2014) and UK (HM Treasury, BIS and Clark, 2014). This has been referred to as a **global-local** tension, described as the geographic scale at which economic processes occur and where power lies (Dicken, 1994).

Global-local tensions are experienced at different levels. At an individual level, Bozeman and Corley (2004) found that most US researchers preferred to work with colleagues in their own work group, university or vicinity rather than form links within cosmopolitan networks of individuals outside these boundaries. However, more collaboratively cosmopolitan academics are more productive (Lee and Bozeman, 2005) and can leverage both local and cosmopolitan networks to access resources (Baglieri and Lorenzoni, 2012; Mosey, Westhead and Lockett, 2007). At an organisational level, top universities have adopted “glocalisation” (Carayannis and Campbell, 2012; Carayannis and Rakhmatullin, 2014) (Hagen, 2002), creating denser connections between actors on the regional/local level, extensive connections to global innovation networks, and parallel processes of applied and experimental research as well as “strategic science” (basic research expected to produce a broad base of knowledge likely to be useful in tackling current or future practical problems) (Rip, 2002). There is some empirical evidence to support this (Lawton Smith and Bagchi-Sen, 2012). At a national level, the global-local tension has emerged in instances of multiple or ambiguous policies (Gornitzka, 1999; Gunasekara, 2006; Kauppinen, 2012) and in conflicts between national and regional priorities (Rasmussen and Gulbrandsen, 2012).

2.1.4.16 Nation state – competition state

Guston and Keniston (1994, pp.26–28) identify plutocratic tensions as emerging from the possibility that forms of organisation that are best for rapid deployment of science may be at odds with those necessary for democracy to flourish. An example of a plutocratic tension is nation state-competitive state, referring to

governments' attempts to balance social justice and global competitiveness (Cerny, 1997). The need for greater international competitiveness towards the end of the 20th century led to the decline of embedded liberal policies emphasising welfare maximisation within the US and UK and the rise of neoliberal *lassiez-faire* economics emphasising increased marketisation and stratification (the social hierarchy produced by welfare state policies) (Fougner, 2006; Ruggie, 1982; Willemsse and de Beer, 2012). Cerny (1997) argues that this shift towards competitive statehood results in three paradoxes, expansion of state intervention and regulation in the name of competitiveness, the promotion of new forms of complex globalisation by state actors in response to perceptions of "global realities" (e.g. Jacob, 2003), and an erosion of national *gemeinschaft* or the communal solidarity which gave the modern nation-state its deeper legitimacy, institutionalised power and social embeddedness. This tension may be implicated in government attempts to balance policies encouraging greater concentration of research in a small number of elite HEIs and distributing research funding nationally to encourage regional development and social cohesion (Maassen and Stensaker, 2011), or academic entrepreneurship and gender equality (Keisu, Abrahamsson and Rönnblom, 2015).

2.1.4.17 Protective state – productive state

Within public choice theory, Buchanan (1975, p.68) distinguishes between two roles of government, a "negative" role of upholding judicial and regulatory safeguards and a "positive" role of extracting compliance from individuals in order to engineer a market order. According to Buchanan, a protective state-productive state tension arises where these roles are not kept distinct, leading to confusion. Economic policy underpinned by public choice theory emphasises a *laissez-faire* approach, limiting government to a market fixing role. However, emerging political, economic, demographic, and sociotechnical trends, such as rising income disparities and inequality of opportunities, have highlighted that innovation excludes sections of society and the environment (Greenwald and

Stiglitz, 2013). This has led to the laissez-faire approach being challenged and calls for a more active role for government in innovation, including an increasing emphasis on market creation (Mazzucato, 2016a) and research funding directed towards sustainable development goals. No empirical explorations of this tension were identified.

2.1.4.18 Public – private

The public-private tension concerns competing imperatives for the socialisation versus privatisation of knowledge and information, and emerges in redefined notions of accountability between public, private and third sectors (Rappert, 1995). From the late 1980s, early innovation policy instruments were justified by a market failure rationale: scientific progress was seen as the main causal factor behind economic progress, but the non-rivalrous and non-excludable properties of knowledge meant that rational private sector firms would underinvest in knowledge creation (Fagerberg, 2017; Stiglitz, 1999). Such policies have contributed to a blurring of boundaries between public (including HEIs) and private sectors through a range of third mission activities (Eun, Lee and Wu, 2006). Some authors argue that the extent of this blurring is such that certain knowledge domains have seen an erosion of the division of academic and industrial labour into single hybrid scientific fields (Owen-Smith, 2003; Powell and Owen-Smith, 1998; Vallas and Kleinman, 2008), leading Lynskey (2006) to claim that the public-private tension is a redundant dichotomy.

However, public-private may be more dialectical or paradoxical than Lynskey allows, as this blurring has resulted in the emergence of another market failure, ownership of and extraction of rents from publicly-funded academic research. One area in which this tension emerges is increasing financialisation in certain industries which hinders long-term innovation (Mazzucato, 2013). Another is open science, where new policy instruments of both government and third sector organisations have been introduced, ostensibly to curb rent-seeking behaviours of academic publishers and maintain a balance between publicly-funded research and commercial R&D sub-systems (David, 2003). This is

ostensible because of Mirowski's (2018) argument that the performance of open science in tackling public distrust of science, encouraging science democratisation and reversing the slowdown of science productivity is underwhelming, and that the actual agenda is a replacement of scientific journals by platform capitalism.

2.1.4.19 Internal – external orientation

In empirical work based on Quinn and Rohrbaugh's (1981) exploration of organisational values, Kleijnen et al. (2009) identified three tensions between pairs of competing values in a University context. The first of these, **internal-external orientation**, concerns a preference for organisational focus ranging from internal & person-oriented to external and organisation oriented. An internal focus emphasises processes such as timetables, task allocation, promoting mutual collaboration and creating a positive atmosphere. An external focus emphasises alignment to the expectations of professional fields, local businesses and government. Both **centralisation-decentralisation** (Siggelkow and Levinthal, 2003), the adoption of activity configurations that are internally consistent and/or appropriate to the external environment, and **profit-purpose** (Margolis and Walsh, 2003), concerning desirable, interdependent and conflicting sustainability objectives such as profit and public good, are related to this tension.

Various instantiations of internal-external orientation tensions emerge within universities, including potential ethical issues (Kenney, 1987; Kumar, 2010), societal roles (Breznitz and Feldman, 2012; Harloe and Perry, 2004; Jongbloed, 2015; Mohrman, Ma and Baker, 2008; Styhre and Lind, 2010a) and potential detrimental effects on teaching and service functions and on pure research caused by an emphasis on entrepreneurial research (Etzkowitz, 2013; Mintrom, 2008) or industry relevance (Chia, 2014). Empirical studies include explorations of knowledge exploitation incentives (Debackere and Veugelers, 2005), selection of market-oriented practices (Popp Berman, 2012), policies (Feldman and Desrochers, 2004) and strategies (Abreu et al., 2009; Häyrynen-Alestalo

and Peltola, 2006; Kruss, 2006), conducting entrepreneurial activities in a university (Rasmussen, 2011) and the emergence of boundary organisations (Lander, 2016; Murray, 2010; O’Kane et al., 2015; Parker and Crona, 2012), research centres (Elmuti, Abebe and Nicolosi, 2005; Garrett-Jones et al., 2005) and support staff (Kirkland, 2005; Whitchurch, 2010) to achieve congruence between competing stakeholder demands.

2.1.4.20 Control – flexibility

The second value tension identified by Kleijnen et al. (2009) is control-flexibility, concerning preferences for organisational structure emphasising the adoption of strict work rules and adherence to tradition and sense of professionalism or experimentation, innovation and risk taking respectively. Etzkowitz & Zhou (2008) identify a broadly similar conservatism-innovation tension and argue that this is reconciled through faculty autonomy and student turnover.

The control-flexibility tension is equivalent to, or encompasses, other tensions identified in more general organisational contexts, such as **flexibility-efficiency** (Adler, Goldoftas and Levine, 1999) involving choices between organisation designs suited to routine, repetitive tasks or nonroutine, innovative tasks, and empowerment-control (Clegg, da Cunha and e Cunha, 2002; Hackett, 2005), involving the accommodation of individual subjectivity or democratic participation within organisational structures. A related normative tension is **governance-administration** (Anderson et al., 2010; Olssen and Peters, 2005), which differentiates between two forms of control, the professional-academic and administrative modes of governance and decision-making within universities. Finally, **differentiation-integration** (Bouchikhi, 1998; Hagen, 2002) concerns efforts to balance the internal differentiation necessary for an organisation to cope effectively with various dimensions of its environment with efforts to integrate various elements into an organisational whole.

Again, various instantiations of control-flexibility have been identified and empirically explored, including the strategic balance between intellectual and

financial imperatives of research, the forms of partnership encouraged to develop and the incentives and regulations enacted, as well as policy coherence between organisational levels within the HEI (Jones, 2009; Jongbloed, Enders and Salerno, 2008; Kruss, 2006; Tuunainen and Knuuttila, 2009). Centralised versus decentralised models of technology transfer (Debackere and Veugelers, 2005), conflicts of intellectual property management and ownership between faculty and HEIs (Crespo and Dridi, 2007; Cyert and Goodman, 1997; Kneller et al., 2014; Verspagen, 2006; Welsh et al., 2008), emergence of soft bureaucratic forms (Styhre and Lind, 2010b) and resistance to entrepreneurial University strategies (Bridgman, 2007; Philpott et al., 2011; Wersun, 2010) have also been explored.

2.1.4.21 Organisational means – end

The final value tension identified by Kleijnen et al. (2009) is organisational means-end, concerning the degree of closeness to preferred organisational results. An ends or target value, for example high productivity, emphasises ideal and desirable situations. A means value, such as planning and systematic approach, emphasises practices intended to achieve a desired outcome. This appears to have attracted less literature attention than other organisational-embedded tensions. Where it may be discerned is in disconnects arising between goals and results, which Pentland and Feldman (2008) argue is due to a technological determinism whereby organisations focus on designing artifacts (e.g. procedures, checklists, software) rather than routines, or generative systems that produce recognisable, repetitive patterns of interdependent actions. No explicit empirical explorations of this tension were identified. However in the cases of both Stanford and Cambridge Universities, it was reported that initial periods of bottom-up experimentation in knowledge transfer activities by academics accompanied by a loose or non-existent HEI governance structure were essential before consolidation and formal institutionalisation of practices by the HEI could be undertaken (Colyvas, 2007; Minshall, Mortara and Ulrichsen, 2016).

2.1.4.22 Efficiency – effectiveness

Hackett (1990) identifies an efficiency-effectiveness tension, concerning competing demands that research and teaching be both of good quality, and performed within budget and to schedule. This tension is typically associated with the adoption of New Public Management policies and practices by HEIs (Bessant et al., 2015; Milliken and Colohan, 2004; Olssen and Peters, 2005), itself manifested within four tendencies: a continuous worsening of the faculty/student ratio, a growing periphery of precarious faculty surrounding a shrinking core of tenured faculty, a disassociation of teaching and research, and an increase in tuition fees along with a reduction of course duration (Lorenz, 2012). Explorations of the tension are often conceptual, though empirical studies have been published (Boitier and Rivière, 2016; Yokoyama, 2006), and the UK HE sector have employed efficiency and effectiveness to legitimise the economic role of HEIs (UUK, 2015).

2.1.5 Innovation studies perspectives

Innovation studies is defined as “the scholarly study of how innovation takes place and what the important explanatory factors and economic and social consequences are” (Fagerberg, Fosaas and Sapprasert, 2012). These authors have identified three main clusters of literature domains within the field, organising innovation, economics of R&D and innovation systems. The field draws from business, management, economics, management and planning & development.

2.1.5.1 Performing tension

Bartunek and Rynes (2014) suggest that the tension associated with differing goals and competing strategies of academics and practitioners is paradoxical. Differentiation in goal legitimacy between academic science directed towards

additions to the stock of reliable, public knowledge, and commercial R&D directed towards adding to the stream of rents derived from possession of private, socially robust knowledge, is a principle of both the new economics of science (Dasgupta and David, 1994) and Mode 2 (Gibbons, 1999) perspectives. Tensions concerning differing performative goals are particularly associated with pluralistic organisations such as universities (Ambos et al., 2008), characterised as having multiple objectives, diffuse power and knowledge-based work processes (Denis, Langley and Rouleau, 2007).

The performing tension arises in terms of conflicting degrees of risk acceptance and commercial applicability of research (Healy, 2003; Perkmann and Schildt, 2015; Ylijoki, 2003), competing paradigms of utility (Cyert and Goodman, 1997; Jacob et al., 2000), institutional reward mechanisms (Goldstein, 2010) and preferences for the speed and channels of knowledge dissemination (Demain, 2001; Kneller et al., 2014; Rappert, Webster and Charles, 1999; Rappert and Webster, 1997; Welsh et al., 2008). However, that this tension is paradoxical, i.e. that it persists over time, is less likely within certain knowledge domains where academia and industry have merged into a single scientific field (Owen-Smith, 2003; Powell and Owen-Smith, 1998; Sauermann and Stephan, 2013; Vallas and Kleinman, 2008). A dialogic model for maintaining both academic and practical relevance throughout a research project has been developed (Avenier and Cajaiba, 2012).

2.1.5.2 Collaboration – control

Where a performing tension exists between academics and practitioners, questions arise in terms of what form of control is appropriate. Sundaramurthy and Lewis (2003) offer a conceptual argument for a collaboration-control tension concerning agency- and stewardship-based approaches to governance. These approaches respectively involve the curbing by principals of agents' self-serving behaviour at the risk of creating distrust or collaborating with agents at the risk of groupthink. Smith and Lewis (2011) position this tension as an exemplar of an organising paradox, involving competing designs and processes

to achieve a desired outcome. However for this work, and in order to differentiate from control-flexibility, the conceptualisation of the collaboration-control tension is limited to the governance of relations between academics and external dyadic partners.

Empirical studies have demonstrated how cognitive social capital (facilitating mutual understanding and shared goals) and relational social capital (facilitating personal contact, interaction and trust between collaborative partners) mitigates this tension at individual, organisational and alliance levels (Bjerregaard, 2010; Orr and Bennett, 2012; Steinmo, 2015). The influence of project and relationship characteristics on the configuration of project management systems has been explored (Morandi, 2013). Characteristics and strategies of firms that interact with universities under different governance modes have been identified (Bodas Freitas, Geuna and Rossi, 2013) and governance models most suited to encourage knowledge transfer has been explored (Anderson, Michael and Peirce, 2012; Bodas Freitas, Geuna and Rossi, 2012; Rossi, 2010).

2.1.5.3 Knowledge exploration – exploitation

Knowledge exploration-exploitation (March, 1991) concerns contradicting patterns of experimentation within organisations with new alternatives through “search, variation, risk-taking, experimentation, play, flexibility, discovery, and innovation” versus refinement of existing knowledge-related activities involving “choice, production, efficiency, selection, implementation, and execution”.

Knowledge exploration and exploitation are contradictory but mutually enabling tendencies (Farjoun, 2010) within resource allocation decisions (March, 1991) and organisational architectures (Smith and Tushman, 2005) intended to explore new possibilities or exploit old certainties respectively. The tension confronting firms is to engage in sufficient exploitation to maintain and increase short-term performance and simultaneously to devote enough resources to exploration to ensure long-term survival.

Various antecedents of the exploration-exploitation tension have been identified, including absorptive capacity (Cohen and Levinthal, 1990) or the ability to identify, assimilate, and exploit knowledge from the environment, technological diversification (a firm's portfolio of technological activities), appropriability conditions (ability to appropriate innovation revenues), competitive intensity (competitive pressures and incentives), firm size and age (Arvanitis and Woerter, 2015; Lavie, Stettner and Tushman, 2010). Known motivations for firms to engage with academia include improved efficiency through scale economies and knowledge complementarity (West and Bogers, 2014), while an equivalent exploration of policymakers' motivations has not been identified.

Additionally, socio-cognitive factors which inhibit innovation emergence have been conceptualised, namely field-level relational structures which constrain knowledge exploration through control of legitimacy granting mechanisms, knowledge creation processes and role expectations, and cultural-cognitive limitations (e.g. schema concerning perceptions of technological opportunities or partner trust) related to technology structuration and use (Gustafsson and Autio, 2011). Various forms of trust between trading partners have been identified (Sako, 1992, pp.37–40), including contractual trust (predicated on both partners keeping promises), competence trust (expectation that a partner will perform their role competently) and goodwill trust (willingness to do more than formally expected). Empirical exploration of socio-cognitive factors are rare, though the inhibition of knowledge transfer between academics and practitioners due to differing world views, rather than evaluation criteria, has been reported (Nicolai, Schulz and Gobel, 2011).

2.1.5.4 Responsibility – authority

The proposition that moral embeddedness has a role in academic behaviour is controversial. Various authors have argued that social or moral claims upon the scientist must be relinquished to enable them to create knowledge, such is the

value of knowledge to society (Bridgman, 1947; Lübbe, 1986). Others have suggested that such a position is untenable (Russell, 1960). In rejecting the value free stance, Douglas has argued that the moral responsibility of scientists extends as far as their intentional choices, the intended consequences of those choices and the reasonably foreseeable unintended consequences, even where the scientist is unaware of these consequences through negligence, or ignores them through recklessness (Douglas, 2009, pp.70–71). The two types of foreseeable unintended consequences are forbidden knowledge, in which ethically and epistemically justifiable knowledge may be detrimental to society, and knowledge involving well-intended but inaccurate or unreliable empirical claims. She goes on to suggest that a tension (**responsibility-authority**) arises due to contradictions between scientific role responsibilities and general responsibilities as human moral agents, wherein if general responsibilities are not borne by scientists themselves, they must be borne by others and that this would lead to a loss of scientific autonomy (Douglas, 2003). Here, this is regarded as a moral dimension of the authority-autonomy tension discussed earlier (Section 2.1.3.3).

2.1.5.5 Subjective – instrumental value

Here, it is proposed that if moral values-free science is untenable, a second tension may also arise due to contradictions between role and general moral responsibilities of scientists, that of subjective-instrumental value. Subjective value theory (Menger, 1976) holds that value is conferred on resources by the subjective preferences of agents during exchange rather than being derived from objective factors such as labour content of an asset. This view underpins neoliberal economic perspectives holding commercial competitiveness as a rationale for science (Olssen and Peters, 2005). It is also consistent with a liberal model of academia with academics motivated by a collegiate-based reward system (Dasgupta and David, 1994). Instrumental theories of value see value as synonymous with continuity of human experience, either through the continued efficient working of technology systems and the development of

progressive technologies which contribute to human development (Ayres, 1944, p.220) or democratic participation of all those affected in deciding upon the means of achieving progress and the ends that progress seeks to attain (Tool, 2000). In a similar vein, Ashby et al. have proposed three paradoxes in the context of sustainability science, a commercial versus public good service ethos, a business-oriented versus change-oriented role identity and a professional integrity based on scientific values or meeting client expectations (Ashby, Riad and Davenport, 2019).

Literature exploring questions of instrumental and subjective value of research tend to be conceptual and macro level, with the tension itself implicit. For example, the emergence of the societal or grand challenges rationale for research and responsible research and innovation (Flink and Kaldewey, 2018) may be attributable to the tension. Similarly, impact's measurement of *reach* and *significance* (HEFCE, 2012) may also be attributed to the tension, although impact in REF2014 did not provide a measure of research equity (Hinrichs-Krapels and Grant, 2016). Callaghan (2019) suggests that the research process may be more vulnerable to social activism challenging inequality in access to the outcomes of pharmaceutical research than market mechanisms.

2.1.5.6 Insider – outsider

A boundary tension (Jarvenpaa and Wernick, 2011) arises between behaviours within a network that emphasise developing and protecting existing resources and current domains of action, versus behaviors emphasising outside linkages and establishment of new ties. Such a tension has been identified as internal-external legitimacy, concerning the need to develop network-level legitimacy both among participant actors and external stakeholders (Provan and Kenis, 2008). Merton (1972) defined an insider-outsider tension as concerning the monopolistic or privileged access to particular kinds of knowledge held by various groups or strata (insiders) and the enacting of doctrines which allow other groups (outsiders) access to this knowledge at comparatively greater risk or cost. "Outsiderness" and "insiderness" have been conceptualised both as

specific social identities (Simmel, 1920) and as the fluid set of interactions and negotiations between shifting power relations (Naples, 1996). The tension has been used conceptually by Bartunek and Louis (1996; Louis and Bartunek, 1992) but no empirical explorations in the context of research impact were identified.

2.1.5.7 Cohesive – diverse relationships

The cohesive-diverse relationships tension (Jarvenpaa and Wernick, 2011) concerns competing tendencies towards network cohesiveness (homogeneity) and diversity (heterogeneity) in terms of experiential and demographic backgrounds of actors. Cohesiveness is associated with consensus, harmony, trust and depth of knowledge, but also knowledge exploitation at the expense of exploring new possibilities. Diversity is associated with dissent, breadth of knowledge, new ideas and fresh perspectives. Studies of this tension often draw on Granovetter's (1973, 1983) differentiation between strong and weak ties. Strong ties, characterised by frequent communication, long duration and affective attachment, enable cheaper knowledge transfer (including tacit and private knowledge), greater trust and reliability within a network, but also risk functional, cognitive, technological or political lock-in (Boschma, 2005; Grabher, 1993; Jack, 2005). Weak ties enable information to flow to and from other social networks, are positively associated with creativity and allow actors to access resources denied to others in the network (Bozeman, Fay and Slade, 2013; Phelps, Heidl and Wadhwa, 2012). There is empirical evidence to support these claims within the context of university-academic collaborations (Harryson, Kliknaite and Zedtwitz, 2008).

2.1.5.8 Nodal proximity – distance

Nodal proximity is a measure of the similarity of dyadic partners within a network along dimensions including organisational regulation (organisational proximity), knowledge bases (cognitive proximity), norms, rules and laws

(institutional proximity), socially embedded relations (social proximity), national, cultural, and/or ethnic background (cultural–ethnic proximity) and spatial distance (geographical proximity) (Boschma, 2005; Crescenzi, Nathan and Rodríguez-Pose, 2016; Nooteboome, 1999; Torre Shaw and Gilly, 2000). No evidence that a proximity-distance tension has been formally conceptualised was identified, but one may be inferred based on significant empirical evidence concerning various proximity effects on innovation and knowledge transfer.

Here, a nodal proximity-distance tension is conceptualised as the extent to which closeness along any dimension of proximity affects the emergence of impact. Of all forms of proximity, geographic proximity has received most empirical attention. However, some authors have argued that the importance of geographical proximity may well be overestimated due to neglect of other forms of proximity and their interplay with geographical proximity (e.g. Boschma, 2005). For example, it has been shown that knowledge spillovers from the academic sector are geographically localised and that academic-SME interactions vary inversely with distance from a HEI (MacPherson, 1998), but that geographical proximity is less significant than firm characteristics (MacPherson, 2002). Geographical proximity has also been found to be less significant for extraorganisational inventor networks (including academics) than social proximity, but more significant than cultural or cognitive factors (Crescenzi, Nathan and Rodríguez-Pose, 2016). Further, proximity effects may actually be more geographically limited than often assumed, with those influencing collaborations between small US life science research firms being reported to dissipate at distances over 1.5 miles (Kolympiris and Kalaitzandonakes, 2013). Despite these findings, firms from certain sectors, particularly pharmaceuticals, co-locate R&D labs with University departments engaged in frontier science (Abramovsky and Simpson, 2011), though a firm's propensity for local collaboration diminishes where the academic department belongs to a HEI with lower overall research quality (Laursen, Reichstein and Salter, 2011). Geographical clustering of technologically complementary firms has been found to make the proximity of industry and university partners far less important (D'Este, Guy and Iammarino, 2013). Finally, it has been

suggested that innovation policies should focus on facilitating formation of open and diverse networks of inventors rather than spatial clustering (Crescenzi, Nathan and Rodríguez-Pose, 2016).

2.1.5.9 Value creation – value capture

Value in open innovation is driven both by collaboration and value creation among distributed but interdependent actors, as well as their ability to capture value (Chesbrough, Lettl and Ritter, 2018). A tension between value creation and value capture emerges where actors experience contradictory imperatives to be open in order to leverage the knowledge of diverse contributors and to adopt protective attitudes to capture returns from their innovative ideas. This has been referred to as a “paradox of openness” (Laursen and Salter, 2014). An overemphasis on value capture by universities may slow the pace of innovation, as demonstrated in the case of academic patenting by Fabrizio (2007). However, reaching agreement with universities on intellectual property is regarded by UK firms as a relatively minor problem (Hughes, 2011). It has been argued that value capture is determined by the perceived power relationships between buyers and sellers (Bowman and Ambrosini, 2000), and that value negotiation is an important capability for collaborating actors to develop (Chesbrough, Lettl and Ritter, 2018).

2.1.5.10 Determined – emergent organising

The determined-emergent organising tension (Jarvenpaa and Wernick, 2011) concerns competing tendencies towards freedom, autonomy, passion, self-management, proactivity and flexibility on one hand, and control, discipline, problem anticipation and planning on the other. Provan and Kenis (2008) identified three basic models of network governance, in order of descending centralisation of control: lead organisation governance involving high levels of brokerage, asymmetrical power and moderately low goal consensus, network administrative organisation governance involving high levels of brokerage

through a separate administrative entity and moderately high goal consensus, and participant governance involving collective self-governance with low levels of brokerage and high goal consensus. Lissoni (2010) found that only a small percentage of academics could be regarded as brokers, and their links with industry co-inventors were less resilient than with academic co-inventors.

However, Dougherty (2016, pp.1–2) argues that in complex innovation systems, knowledge is fragmented, partially scattered and emerges unpredictably as cause and effect relationships are unknown. In such systems, control becomes ineffective and the only option is to avail of emergence, “to spot minor perturbations that may escalate into major problems or solutions, and to configure fragmented information bits into innovative solutions for significant problems”. No explicit empirical explorations of this tension in the context of research impact were identified.

2.1.5.11 Temporal tensions

Temporality, the perception and constructed, negotiated organising of time, has been identified as critical to a better understanding of impact (MacIntosh et al., 2017; Vostal and Robertson, 2012). However, few empirical explorations of impact-related temporal tensions were identified in the literature, presumably because until recently, temporality has been neglected in the institutional change literature (Granqvist and Gustafsson, 2016).

Temporal tensions are expected to concern contradictory temporal expectations and divergent agency which results as actors engage with different timing norms (Ancona, Goodman and Lawrence, 2001). The form of agency adopted depends on which temporal orientation is dominant in actors' minds (Embirbayer and Micshe, 1998). A past orientation is associated with habitual agency and encourages the selective reactivation of past patterns of thought and action. A present orientation is associated with sensemaking agency, where actors make practical and normative judgements among alternate trajectories of action in response to the emerging demands, dilemmas, and

ambiguities of evolving situations. A future orientation, associated with strategic agency, enables the imaginative generation of possible future trajectories of action defined by actors' hopes, fears, and desires.

For the purposes of this study, possible temporal tensions were categorised in terms of future-past, future-present and past-present temporal orientations. These would be expected to become salient across various temporal dimensions which may be present within engaged scholarship contexts (Albert and Bartunek, 2016). These consist of sequence (the order of events), temporal punctuation (the times when processes begin, pause or come to an end), interval (how much time elapses between events), duration (how long each event lasts), rate (frequency of events), shape (rhythms and other patterns of movement such as cycles, feedback loops and peaks and troughs) and polyphony (interrelationships between simultaneous activities within a pattern).

The past-future tension is conceptualised as concerning contradictions which arise between routines, that is "whatever is done habitually" (Giddens, 1984, p.xxiii), and strategic agency (Dimaggio, 1988), or the "planned persuasion of ends (profit) based on a rational assessment of available means and strategic conditions" (Beckert, 1999). The past-present tension is conceptualised as concerning contradictions between habitual agency and sensemaking (Weick, 1995), the processes through which individuals work to understand novel, unexpected, or confusing events (Maitlis and Christianson, 2014), for example where actors faced with situations of uncertainty do not or cannot follow routines.

The present-future tension is conceptualised as concerning contradictions between strategic agency and sensemaking behaviours. It is, perhaps, here that the most significant temporal tensions emerge concerning academia, where a "spatio-temporal disconnection" (Pels, 2003, p.9) between science and other "more frenzied cultures" has been called for to afford academics significant amounts of time for immersion in a subject area, reflection and critical thought. However, this is not congruent with the temporal logic of capitalism and late modernity where "Speed has become a top-ranking concern, if not the ultimate

criterion of evaluation in our efforts to ensure the dynamism of the economy and its various sub-systems” (Chesneaux, 2000). As a consequence, tensions emerge between the clock-time pacing of strategic managers, gaging progress by the predictable passage of *chronos* or clock time, and the event-time (*kairos*) pacing of scientists, which gauges progress by the unpredictable achievement of learning events (Dougherty et al., 2013). This is supported by a number of empirical studies (Loan-Clarke and Preston, 2002; Mintrom, 2009).

2.1.6 Limitations

Although there is a significant body of literature which explores tensions in the context of research and impact, it is spread across at least three domains and has not been reconciled. The weight of focus of empirical studies is skewed towards cultural tensions which sees academics and practitioners separated by cultural norms. Thus, there is a need for studies which extend beyond the academic-practitioner gap and explore how academic behaviour is mediated by, for example, political, moral, temporal, disciplinary, organisational and other institutional spheres.

2.2 The institutional logics perspective

2.2.1 Overview of the institutional logics perspective

The main innovation of the logics approach compared to neoinstitutionalism, its antecedent, is the conceptualisation of society as an inter-institutional system of orders, where an order is defined as “a domain of institutions built around a cornerstone institution that represents the cultural symbols and material practices that govern a commonly recognized area of life” (Thornton, Ocasio and Lounsbury, 2012, p.54). Seven institutional orders (family, state, community, religion, profession, market and corporation) have been characterised (ibid, p.73). Each order possesses “a central logic” at a societal

level (Thornton and Ocasio, 2013, p.101) which may be translated, in whole or in part, into multiple logics at field level where actors encounter one another. Such institutional logics are defined as “socially constructed, historical patterns of cultural symbols and material practices, including assumptions, values, and beliefs, by which individuals and organizations provide meaning to their daily activity, organize time and space, and reproduce their lives and experiences” (Thornton, Ocasio and Lounsbury, 2012, p.2).

Thornton et al. provide a characterisation of ideal logics (Thornton, Ocasio and Lounsbury, 2012, p.56). These are presented in Table 2-2, with minor modifications, drawing on explorations of academic identity (Becher and Trowler, 2001, p.47; Dasgupta and David, 1994), legitimacy (Miller, 2014) and market identity, legitimacy and authority (Perkmann, Salter and Tartari, 2011) to increase its relevance to a research impact context.

Two assumptions are critical to an understanding of the logics perspective. The core assumption, labelled “embedded agency”, is that the interests, identities, values, and assumptions of individuals and organisations are embedded within logics (Thornton and Ocasio, 2013, p.103). This enables actors to exercise partial autonomy in perceiving and responding to contextual stimuli, while embedded in social, cultural and political structures offering behavioural guidance in terms of both appropriateness and consequences of action. Thus, while both structuralist and rational choice approaches emphasise action based on a single rationality (of taken-for-granted rules and utility maximisation respectively), a logics perspective grants actors the abilities to adhere to, alter or transform social norms based on multiple rationalities.

Table 2-2 Institutional logics, ideal types

Categories	Family	Community	Religion	State	Market	Profession	Corporation
Root metaphor	Family as firm	Common boundary	Temple as bank	State as redistribution mechanism	Transaction	Profession as relational network	Corporation as hierarchy
Sources of legitimacy	Unconditional loyalty	Unity of will, Belief in trust & reciprocity	Importance of faith & sacredness in economy & society	Democratic participation	Successful innovation	Reputation & personal expertise	Market position
Sources of authority	Patriarchal domination	Commitment to community values & ideology	Priesthood charisma	Bureaucratic domination	Accountability to funders	Professional association	Hierarchal position
Sources of identity	Family reputation	Emotional connection, ego-satisfaction & reputation	Association with deities	Social & economic class	Science as a business	Association through technical proficiency, loyalty and prestige	Bureaucratic roles

The second assumption is that institutional pluralism, the situation faced by an actor operating within multiple institutional spheres (Kraatz and Block, 2013, p.243), is the only source of contradictory logics (Jarzabkowski, Matthiesen and van de Ven, 2009, pp.284–285; Thornton, Ocasio and Lounsbury, 2012, p.142). The plurality of social groups in which actors participate offer multiple, sometimes contradictory, goals and identities that may bound intentionality. Institutional pluralism sees conflicting logics simultaneously providing constraint against and opportunities for change (Thornton, Ocasio and Lounsbury, 2012, p.13), allowing actors partial autonomy in decision making. It is argued later that this assumption is an incommensurability problematisation of the logics perspective (Section 6.6). In addition to logics, the immediate situational characteristics, including social context and material properties may also influence intentionality by triggering different social identities and goals, and shaping social interaction.

The identification of means of institutional reproduction, construction and transformation as analytically distinct social mechanisms is therefore an important goal for researchers adopting a logics perspective. Social mechanisms are defined as the virtual reality of the researcher, an abstract representation that provides the logic of a process that could have produced a given real-world observation (Hernes, 1998, p.78). A list of social mechanisms emphasised within the institutional logics perspective is detailed in Table 2-3.

Table 2-3 Social mechanisms of institutional generation, reproduction or transformation

Level	Mechanism	Description	Ref. ¹
Micro (individual intentionality)	Social identity	Defined in terms of both category membership (e.g. profession, employer, nationality, gender) and relational role (e.g. leader, investor, collaborator).	p.85
	Goals	Multiple and sometimes discrepant goals that guide cognition and both current and planned action in diverse situations and domains, and are activated by focus of attention	p.86
	Schema	Learned, organised cognitive structures that shape attention, construal, inference and problem solving (used interchangeably with interpretive schemes, mental models and givens)	p.88
Micro (social interaction)	Decision-making	Concerns actions and behaviours that have consequences beyond the immediate social interaction in which the decision was made	p.95
	Sensemaking	The process by which actors turn circumstances into situations that are comprehended explicitly in words and that serve as springboards for action	p.96
	Mobilisation	The process by which collective actors acquire symbolic and material resources and motivate people towards the accomplishment of group or collective goals. Three types identified: Event sequencing: temporal and sequential unfolding of unique events that dislocate, rearticulate, and transform the interpretation and meaning of cultural symbols and social and economic structures Institutional entrepreneurs are the agents that create new and modify old institutions because they have access to resources that support their self-interests Structural overlap occurs when individual roles and organisational structures and functions that were previously distinct are forced into association	p.97

Level	Mechanism	Description	Ref.¹
Meso (organisational)	Organisational practices	Forms or constellations of socially meaningful activity that are relatively coherent and established	p. 128
	Collective identities	Groups or categories of actors that can be strategically constructed, organised around a shared purpose and similar outputs	p.141-6
	New community formation	Emergence of communities with new collective identities or different practices	p.141-6
Macro (field)	Theories	Abstract and systematic forms of symbolic representation of institutional logics, providing general guiding principles and explanations for why and how institutional structures and practices should operate, though need not reflect actual organising practices and may serve as political instruments	p.152
	Frames	More concrete and less systematic than explicit theories, inherently political and rhetorical, generating cultural resonance, facilitating group identification and mobilisation. Closely related to schemas, but while schemas are cognitive and either explicitly or tacitly known, frames are explicitly articulated through symbolic interactions and negotiations	p.154
	Narratives	Stories or accounts that organise events and actions into a whole, thereby attributing significance to specific actors, events and practices. Shaped by theories and invoking frames, linking these with organising practices	p.155
	Resource environment	Affect the construction of institutional logics through opportunities and constraints they provide in the generation of material practices.	p.157
	Vocabularies of practice	Systems of labeled categories used by members of a social collective to make sense of and construct organising practices, guiding attention, decision making and mobilisation and providing a sense of collective identity. New vocabularies of practice may develop through emergence of new category labels (labels of organising practices) or changes in category meanings	p.159

Level	Mechanism	Description	Ref.¹
Macro (field)	Field-level practices	Similar to organisational practices, but at field level, and may be internal or external to a field	P168
	External logics	Logics developed in other institutional fields that are considered to be instantiations, variations or hybrids of societal-level logics	p.150
	Field logics	Translations and adoptions of societal and external logics at field level, either in whole or in part, as field logics, through symbolic representations including theories, frames and narratives	p.158-161
	Resource competition	Competition between actors for resources	(Thornton and Ocasio, 1999)
	Temporal orientation	Orientation towards the past, present or future	(Granqvist and Gustafsson, 2016)

¹ (Thornton, Ocasio and Lounsbury, 2012)

2.2.2 Deployments of institutional logics in impact contexts

Lam (2010) observes a tendency in studies deploying the logics perspective to view the shifting boundary between academia and private business as an attack by a new entrepreneurial logic on a traditional academic logic. This may be considered as a progressive coherence (Locke and Golden-Biddle, 1997), i.e. a shared theoretical perspective that has advanced over time, concerning a binary societal system of science consisting of academic (i.e. professional) and entrepreneurial (i.e. market) logics. As shown in Table 2-4, this consensus remains mostly intact, though there have been isolated conceptualisations of ternary systems involving professional, market and state or medical logics.

A number of incompleteness problematisations concerning deployments of the logics perspective in impact contexts may be identified. Lam (2010) notes that studies have focussed on major research universities, as indeed have most of the subsequent studies listed in Table 2-4. These studies have also concentrated on knowledge commercialisation from the physical, life or applied sciences and typically adopt top down macro-micro or -meso perspectives, while neglecting nested embeddedness (Kenney and Goe, 2004).

Jarzabkowski has noted that studies focus on institutional change and fail to identify how different logics coexist (Jarzabkowski, Matthiesen and van de Ven, 2009, p.286). Indeed, only one exploration of logics coexistence in an impact context was identified (Smith-Doerr, 2005), while the majority explore logics expansions (change in scope of a logic where practices and narratives in one field lead to expansion in other fields), assimilations (incorporation of external dimensions into a prevailing logic), replacements (of one logic by another), blending (combining dimensions of diverse logics into a transformed logic) or elaboration (an endogenous reinforcement of a prevailing logic) (Thornton, Ocasio and Lounsbury, 2012, p.164).

Table 2-4 Literature deployments of institutional logics in impact contexts

Paper	Contribution	Conceptualisation ¹
(Smith-Doerr, 2005)	Rather than institutional change being a process of delegitimation followed by displacement, contradictory institutions may coexist in network organisations through multiple forms of legitimation.	Co-existence of market and professional logics
(Colyvas, 2007)	Early institutionalisation of academic entrepreneurship at a HEI involved a bottom-up generation of diverse commercialisation approaches and debate, juxtaposing logics of administrators, technology licensing associates and faculty, followed by consolidation and practice selection.	Expansion of market logic into professional logic
(Murray, 2010)	Overlapping academic and commercial logics may maintain a distinctive boundary through contestation rather than collapsing, blending, or easily coexisting.	Assimilation of commercial (i.e. market) logic by professional logic
(Lam, 2010)	Rather than a market logic dominating academia, scientists are active agents engaging in boundary work to protect and negotiate their positions, and adopt heterogeneous role identities.	Assimilation of market logic by professional logic
(Bjerregaard, 2010)	Normative conflict between academic and industry researchers was mitigated by a blurring of logics and the emergence of shared cultural spaces for knowledge exchange and communication in joint projects.	Mutual assimilation of market and professional logics
(Perkmann, Salter and Tartari, 2011)	Logics hybridisation is pursued through arbitrage by individuals with high field status, whereas individuals with high organisational status become “contaminated” or embrace the ends associated with an alternative logic.	Replacement of professional by market logic; Elaboration of professional logic
(Upton and Warshaw, 2017)	Exploration of the incorporation of market logics in mission and planning documents of 3 US research universities and the creation of a hybrid academic capitalism/public good logic.	Blending of market and professional logics
(Popp Berman, 2012)	Proposes a “practice selection” model as an alternative to institutional entrepreneurship to explain how a market logic emerged in US academic science.	Replacement of professional by market logic

Paper	Contribution	Conceptualisation ¹
(Sauermann and Stephan, 2013)	Ideal types of academic and commercial logics overstate differences between industrial and academic science while ignoring heterogeneity within each.	Assimilation between market and professional logics
(Lind, Styhre and Aaboen, 2013)	Different logics of academics, industry actors and funding agencies are present in collaborations in different ways resulting in four different types of research processes.	Assimilation between professional, market and state logics
(Fini and Toschi, 2016)	Academic entrepreneurs implement their entrepreneurial intentions in accordance with their academic institutional environment, leveraging awareness of technical competencies more than non-academic entrepreneurs, but entrepreneurial self-efficacy and awareness of managerial skills considerably less.	Assimilation of market by professional logic
(van Schalkwyk and de Lange, 2018)	The embedding of engagement within a HEI was partially driven by market logics that favour financial imperatives over those of place-making.	Expansion of market and contraction of community logics
(Berggren and Karabag, 2019)	Explores how various actors drew on academic, market and medical logics to sustain or expose scientific misconduct.	Elaboration of market and professional logics

¹ Assignment made with reference to the typology of change in field-level logics (Thornton, Ocasio and Lounsbury, 2012, p.164)

2.2.3 Limitations

The institutional logics literature is a relatively new but growing domain with a core text (Thornton, Ocasio and Lounsbury, 2012), that offers a fruitful perspective on how micro and meso-level behaviour is mediated by macro-level institutions. However, a number of incompleteness problematisations were identified regarding deployment of the logics perspective in impact contexts concerning the nature of the societal system of science, the narrowness of context (disciplinary, organisational and activity). These problematisations likely contribute to an overstating of differences between academia and other sectors and a neglect of heterogeneity within academia (Sauermann and Stephan, 2013). Further, an incommensurability problematisation of the logics perspective concerning institutional pluralism as the only source of contradictory logics was highlighted. This justifies the deployment of the logics perspective in a broadened context of impact derived from research in disciplines other than physical, life or applied sciences and from a range of HEIs in terms of research intensity.

2.3 Embeddedness

2.3.1 Overview of embeddedness

As originally conceived (Thornton, Ocasio and Lounsbury, 2012, pp.79–80), the logics perspective encompasses social (consisting of relational and structural), cognitive, cultural and political embeddedness as theories of action (for definitions, see Table 2-5). More recently, temporal embeddedness has been incorporated into the logics perspective (Granqvist and Gustafsson, 2016). Thus, the logics approach presently integrates structural (coercive), normative, symbolic (cognitive) and temporal as necessary and complementary dimensions of institutions, viewing actors as embedded in social, cultural, temporal and political structures, and guided by cognitively bounded identities and goals.

Table 2-5 Types of embeddedness

Embeddedness	Definition	Reference
Cultural	The role of shared collective understandings in shaping economic strategies and goals	(Zukin and Dimaggio, 1990, p.17)
Cognitive	Ways in which the structured regularities of mental processes limit the exercise of economic reasoning	(Zukin and Dimaggio, 1990, pp.15–16)
Political	The manner in which economic institutions and decisions are shaped by the struggle for power that involves economic actors and nonmarket institutions	(Zukin and Dimaggio, 1990, p.20)
Temporal	The social ordering effects of time...that shape opportunity and stratification across levels of analysis	(Dacin, Ventresca and Beal, 1999)
Social	The contextualisation of economic activity in on-going patterns of dyadic (pair wise) relations and... the structure of the overall network of relations	(Granovetter, 1992, p.33)
Relational	The personal relationships people have developed with each other through a history of interactions	(Nahapiet and Ghoshal, 1998)
Structural	The impersonal configuration of linkages between people or units	(Nahapiet and Ghoshal, 1998)
Epistemic	A situation where the reality to which (expert knowledge creation and validation) activities are oriented is no longer simply the 'natural reality out there' as interpreted within a frame of reference of personal experience and social conventions...(but) a reality purposefully assembled and unfolded by professional knowledge workers and whole technological systems which provide frames of reference and the means for experience and transactions to take place	(Knorr-Cetina and Preda, 2001, pp.30–31)

Embeddedness	Definition	Reference
Occupational	The totality of forces that keep people in their current occupations	(Ng and Feldman, 2007)
Organisational	The totality of forces that keep people in their current employment	(Ng and Feldman, 2007)
Moral	The role morally oriented behaviour plays in market exchange	(Ballet and Pouchain, 2015; Beckert, 2005)
Knowledge	The process of effectively linking together one actor's productive knowledge with that of another through qualitative coordination	(Nielsen, 2005)
Technological	The way in which technology introduces a material aspect to organisational elements such as routines, roles, and data	(Volkoff, Strong and Elmes, 2007)
Market	The extent to which market operations are affected by social relations of the actors involved	(Frenzen and Davis, 1990)
Nested	The extent to which an actor's behaviour is influenced by being embedded within a nested structure of institutional layers	(Kenney and Goe, 2004)

Cultural embeddedness provides the main foundation of the logics perspective. Culture limits economic rationality by constituting the structures in which economic self-interest plays out and constraining the freeplay of market forces by proscribing or limiting market exchange in sacred objects and relations, or between ritually classified groups (Zukin and Dimaggio, 1990, p.17).

Explorations of cultural tensions within academia have centered on Merton's (1973, pp.273–305) seminal ethos of academic science. However, it has been argued that this normative structure of science is often misrepresented as a simplistic caricature in subsequent literature (Panofsky, 2010, p.140), a trend Merton himself noted (Merton and Barber, 1976, pp.56–64). Merton viewed the ethos of science as a historically situated process comprised of oppositional norm/counter-norm tensions and contingent local circumstances which alternately governed academic behaviour through a process of sociological ambivalence (Arribas-Ayllon and Bartlett, 2014; Merton, 1976). Others have seen them as professed norms (essentially a legitimising strategy aimed at non-academic out-groups) rather than as statistical norms (patterns of positively sanctioned activity) (Barnes and Dolby, 1970).

Cognitive embeddedness limits the exercise of economic reasoning (Zukin and Dimaggio, 1990, pp.15–16). Cognitive tensions are expected to include contradictions involving cognitive values [“those aspects of scientific work that help scientists think through the evidential and inferential aspects of theories and data” (Douglas, 2009, p.93)], such as accuracy, internal and external consistency, scope, simplicity and fruitfulness (Kuhn, 1977, pp.321–322).

Political embeddedness may be understood within a national context as the depth and extent of an actor's interrelationship with the polity (McNally and Wright, 2010). Political factors shape actors' behavior by altering the context in which actors interact (Dacin, Ventresca and Beal, 1999), therefore tensions are expected to arise as a consequence of altered, or attempts to alter, such contexts. Three dimensions of political embeddedness have been identified (Ciabuschi, Kong and Su, 2017), political influence (the strength and constraints of government policies and regulations by which an actor is affected), political

networks (an actor's ties with political actors) and political cognition (an actor's behavior and cultural alignment with the values and beliefs of political actors).

Temporal embeddedness includes the flow and structuring of time as well as how multiple interpretations of the past, present, and future shape outcomes (Kaplan and Orlikowski, 2013). Tensions are expected to concern contradictory temporal expectations and divergent agency which result as actors engage with different timing norms (Ancona, Goodman and Lawrence, 2001). The form of agency adopted depends on which temporal orientation is dominant in actors' minds (Embairbayer and Micshe, 1998).

Social embeddedness, originally conceptualised by Granovetter (1992, p.33), was subsequently separated into separate structural and relational components by Nahapiet and Ghoshal (1998). Key facets of relational embeddedness include overlapping identities and feelings of closeness or interpersonal solidarity (Moran, 2005), and tensions are expected to arise concerning such facets. Structural embeddedness emphasises the presence or absence of network ties between actors, connectivity, centrality and hierarchy. Explorations of structurally embedded tensions are relatively rare in the literature, and it is only recently that an exploration of the microfoundations of social networks has been undertaken (Tasselli and Kilduff, 2015).

However, other forms of embeddedness have also been conceptualised (Table 2-5), but have not as yet been associated with the logics perspective. This suggests the possibility of an inadequacy problematisation (Locke and Golden-Biddle, 1997) of the perspective, i.e. that it may not sufficiently incorporate different perspectives and views of the phenomena under investigation. These forms of embeddedness are described below.

Epistemic embeddedness concerns realities purposefully assembled and unfolded by professional knowledge workers and whole technological systems which provide frames of reference and the means for experience and transactions to take place (Knorr-Cetina and Preda, 2001, pp.30–31).

Epistemic tensions are expected to involve conflicts of epistemic values, or the "basic criteria that any scientific work must meet" to produce reliable knowledge

such as internal consistency and predictive competence (Douglas, 2009, pp.92–94).

Occupational embeddedness concerns the totality of forces that keep people in their current occupations (Ng and Feldman, 2007). Occupationally embedded tensions would be expected to emerge across any of three identified dimensions of occupational embeddedness: fit, links and sacrifice. Fit is the extent to which an individual's abilities match occupational requirements and an individual's interests match occupational rewards. Links refer to the extent to which individuals have ties to other people and activities in the occupation. Sacrifice is the totality of losses which individuals would incur by leaving their occupation. For the purposes of this work, occupation is taken to mean membership of an academic community, such as a field or discipline, but not a University department, centre or school (see organisational embeddedness).

Similarly, organisational embeddedness is the totality of forces that keep people in their current employment (Ng and Feldman, 2007). Organisationally embedded tensions may emerge across dimensions of fit, links, and sacrifice. Fit is the extent to which an individual's abilities match organisational requirements and an individual's interests match organisational rewards. Links refer to the extent of ties individuals have with other people and activities at work. Sacrifice is the totality of losses which individuals would incur by leaving their organisations.

Moral embeddedness has been invoked in the context of what role morally oriented behaviour plays in market exchange (Ballet and Pouchain, 2015; Beckert, 2005). Here, it is closely associated with Weber's (1978, pp.24–25) typology of social action, and specifically instrumentally-rational and value-rational action. Instrumentally-rational action is determined by expectations as to the behaviour of objects in the environment of others, used as means for the attainment of an actor's own rationally calculated ends. Value-rational action is determined by a conscious belief in the value for its own sake of some ethical, aesthetic, religious, or other form of behaviour, independently of its prospects of success.

Knowledge embeddedness is conceptualised as a specific form of relational embeddedness, and is a dyadic construct which refers to the process of effectively linking together one actor's productive knowledge with that of another through qualitative coordination (Nielsen, 2005). Tensions would be expected to be associated with any of five antecedents of knowledge embeddedness. Knowledge complementarity is skills and resources that the other partner needs but does not have. Knowledge compatibility describes some level of match between the knowledge bases of either actor of the dyad. Tacitness refers to the degree to which knowledge is subjective, difficult to formalise, articulate, and communicate to others (Huang, Hsieh and He, 2014). Trust is necessary in economic exchange due to bounded rationality, imperfect information, risk and uncertainty (Sako, 1992, pp.37–40). Knowledge protectiveness refers to the safeguards in place against opportunistic behaviour in the dyad.

Technological embeddedness (Volkoff, Strong and Elmes, 2007) concerns the material aspect technology introduces to organisational routines, roles, and data. It is associated with technology adoption or exchange. Three dimensions of technological embeddedness have been identified, aggregate (percentage of technology ownership in a local area), number of diffusion channels (how an actor encounters a technology) and interaction intensity between the actor and technology (Peng, Wang and Kasuganti, 2011).

Market embeddedness refers to markets in which social relations alter market relations (Frenzen and Davis, 1990). Buyers may purchase from sellers based on combinations of two distinct and independent forms of utility, acquisition utility (derived from the good purchased) and exchange utility (derived from contributions made to strong social relations). Strong social relations between buyer and seller is associated with a greater contribution of exchange utility to overall utility. Two dimensions of market embeddedness have been identified, tie strength and outstanding buyer-seller obligations.

Nested embeddedness concerns the influence of nested structures of institutional layers on behaviour (Kenney and Goe, 2004). Three levels of

nested embeddedness have been identified, socio-cultural foundations, institutional arrangements, and structural embeddedness (Dacin, Ventresca and Beal, 1999). Development and deployment of this concept remains at a preliminary stage.

2.3.2 Deployments of embeddedness in impact contexts

Embeddedness has been previously deployed in impact contexts in the literature, and a synthesis is provided in Table 2-6. These studies share an incompleteness problematisation concerning a focus on physical, life or applied sciences as those employing a logics perspective. A second incompleteness problematisation is that social (structural and/or relational) is predominantly explored, while other forms of embeddedness are either sporadically explored or remain unexplored. Furthermore, it should be noted that the overlap between these studies and those deploying the logics perspective (Table 2-4) in impact contexts consists of just a single study (van Schalkwyk and de Lange, 2018), suggesting that the two literature domains do not draw upon one another and strengthening the likelihood of an inadequacy problematisation concerning insufficient incorporation of different forms of embeddedness in the logics perspective. However, the levels of analysis employed in embeddedness studies, ranging from individual, dyadic and organisational to regional and network, are much broader in range than those employing the logics perspective.

Table 2-6 Literature deployments of embeddedness in impact contexts

Paper	Contribution	Embeddedness
(Allison and Keane, 2001)	Exploration of the complexity and role of HEIs in regional development across multiple dimensions.	Social
(Owen-Smith and Powell, 2003)	Technology licensing officers draw upon the expertise of corporate partners to evaluate the potential impact of invention disclosures, enabling well-connected institutions to develop higher impact patent portfolios.	Structural
(Nicolaou and Birley, 2003)	An academic entrepreneur's structural embeddedness in a network of exo-institutional and endo-institutional ties influences the type of spinout initiated.	Structural
(Cooke, 2004)	Explores the emergence of bioscience megacentres in a nurturing economic business environment consisting of high quality inputs, availability and sophistication of local suppliers, the presence of clusters of related firms, sophistication of local demand, regulatory environment, rules governing the vitality of competition and incentives for productive rivalry. Megacentres also create new regional disparities, necessitating development of regional science policies and funding to offset spatial biases intrinsic in traditional research funding regimes.	Social
(Kenney and Goe, 2004)	Being embedded in an academic department and disciplines with cultures that are supportive of entrepreneurial activity can help counteract the disincentives created by a university environment that is not strongly supportive of these activities.	Nested
(Murray, 2004)	An academic's social capital (local and cosmopolitan networks) can be translated by entrepreneurial firms into critical scientific networks in which firms become embedded. Scientific careers shape social capital and mediate the networks and potential for embeddedness that an academic inventor brings to a firm.	Relational

Paper	Contribution	Embeddedness
(Thieme, 2007)	Two distinct forms of social capital, brokerage and closure, are active in the creation of competitive advantages for scholars who are appropriately embedded within their relational networks. Brokerage involves weak ties with other scholars who represent a diverse cross-section of ideas, skills, and perspectives, enabling actors to span as many structural holes as possible. Closure involves strong ties with other scholars with similar interests.	Structural
(Kitagawa, 2007)	Examines developments in the governance of science and innovation in Japan, focusing on the policy instruments used, their impact on regional economic development, social embeddedness in regions and the ability of regions to coordinate innovation support policies.	Social
(Moodysson, 2008)	Interactive knowledge creation in the life sciences, which appears to be spontaneous and unregulated, is the result of formal, structured, and thoroughly planned linkages that are more or less detached from social relations, rather than a result of unplanned and unreflected social interaction	Structural
(Grossetti, 2008)	Proximity and embeddedness between firms in local social networks are just specific contexts for emergence of collaborations and access to resources during new company creation, but not necessarily a specific mode of regulation of professional or technologic relations	Structural
(Xu, Huang and Gao, 2011)	R&D capacity and firm size have different moderating effects on foreign direct investment (FDI) firms and local firms, suggesting that internal capability and external personal relationship with universities are substitutes in local firms but complementary in FDI firms.	Cultural and social
(Yoneyama, 2012)	Collaborations of R&D bases with local companies in the same industry of the host country enhance only the efficiency of R&D activities, while those with local universities, public research institutions, and companies in different industries increase overall R&D performance (efficiency of R&D activities and the quality of technological outputs). Collaboration becomes less active when R&D bases have senior managers from the organisation's home country. As the percentage of researchers from the home country increases, collaborations with local companies in the same industry increase, but those with local universities and other research institutions do not.	Relational

Paper	Contribution	Embeddedness
(Casper, 2013)	The existence of strong social networks linking inventors heightens university commercialisation output.	Social
(Bergenholtz and Bjerregaard, 2014)	University-industry search processes and network formations of a high-tech small firm (HTSF) are shaped by institutional conditions and structural embeddedness. Embeddedness in pre-existing ties is not necessarily the most effective means for firms to optimise U-I search and network-formation.	Structural
(van Schalkwyk and de Lange, 2018)	The embedding of engagement within a HEI was driven, at least partially, by market logics that favour financial imperatives over those of place-making.	Cultural
(Teelken, Weijden and Teelken, 2018)	Postdocs lack of clarity concerning their career prospects and developments and are weakly connected to the HEI, despite being specialised staff, contributing to the primary process of their HEI.	Organisational
(Fongwa, 2018)	Weak knowledge and social capabilities undermine place-based innovation, interactive learning and ultimately development. A continuously reflexive and engaged policy making process of learning, networking and institutional embeddedness is critical to enable HEIs to make an ongoing contribution to place-based development.	Structural

2.3.3 Limitations

Although the concept of embeddedness is almost thirty years old and has been employed in a large number of studies, the domain appears fragmented with no core text and only a handful of papers which explore more than one form of embeddedness. Within impact contexts, social (relational and/or structural) embeddedness has been predominantly deployed, while all other forms have been neglected. Further, although embeddedness constitutes the theory of action of the institutional logics perspective, the logics and embeddedness domains are largely separate. Hence, there is a need to establish what forms of embeddedness underpin interactions between logics.

2.4 Tension responses

There are two major approaches to the exploration of tension responses. The predominant is contingency theory (Lawrence and Lorsch, 1967), which assumes that organisational systems are most effective when they achieve alignment or fit between their internal elements and the external environment. The other is paradox theory, which holds that while contingency approaches of choosing among competing tensions might aid short-term performance, long-term sustainability requires continuous efforts to meet multiple, divergent demands (Lewis and Smith, 2014). These authors define paradoxes as “contradictory yet interrelated elements that exist simultaneously and persist over time”. This perspective sees salient tensions spurring two types of response (Smith and Lewis, 2011). Defensive responses (encompassing contingency-based responses) involve preferentially attending to one pole or the tension through factors such as organisational inertia, emotional anxiety, defensiveness or the desire for consistency, and may trap actors in vicious cycles in which the tension is perpetuated and exacerbated. Strategic responses involve attending to competing demands simultaneously, leading to virtuous cycles of successful change. Such responses require cognitive and behavioural complexity, emotional equanimity, and dynamic organisational capabilities. A typology of both response types is detailed in Table 2-7.

Table 2-7 Responses to tensions

Response type	Response	Description	Reference
Defensive	Splitting	Creating further polarising contradictions (forming subgroups or artificial we/they distinctions) that mask similarities and reinforce distinctiveness	(Lewis, 2000)
	Projecting	Projecting the conflicting attributes to another, often a scapegoat	(Lewis, 2000)
	Repressing	Repressing or ignoring the experience	(Lewis, 2000)
	Regressing	regressing to a prior state when the tensions were not salient	(Lewis, 2000)
	Reaction formation	Excessively manifesting the feeling or practice opposite to the threatening one	(Lewis, 2000)
	Ambivalence	Compromise of conflicting emotions within "lukewarm" reactions that lose the vitality of extremes.	(Lewis, 2000)
	Avoiding risk	Selecting between risky prospects wherein value is assigned to gains and losses of each rather than to expected utility of outcomes	(Kahneman and Tversky, 1979)
	Avoiding conflict	Selecting responses to avoid conflict concerning issues regarded as central by another (vital to physical wellbeing, socio-economic position, self-esteem or defence against anxiety)	(Deutsch, 1973, p.371)
	Drive towards consistency	Making choices to maintain consistency between what a person knows or believes and what he/she does	(Festinger, 1957, p.1)
	Drive towards simplicity	Overwhelming preoccupation with a single goal, strategic activity, department or world view, precluding consideration of others	(Miller, 1993)
Contamination	Engagement with alternative logics leading actors to compromise their original logic and acquiesce to the alternative logic	(Perkmann, Salter and Tartari, 2011)	

Response type	Response	Description	Reference
Strategic	Acceptance	Learning to live with paradox, e.g. by avoiding debates and focusing on tasks	(Lewis, 2000)
	Confronting	Discussing their tensions to socially construct a more accommodating understanding or practice	(Lewis, 2000)
	Transcendence	Critical self- and social reflection examining entrenched assumptions to construct a more accommodating perception of opposites	(Lewis, 2000)
	Combined strategies	Examples include managing the tension as paradoxical at one level and as a dilemma or dialectic at another, or differentiation-integration, splitting tensions to focus dedicated attention to each element followed by building synergies between tensions	(Andriopoulos and Lewis, 2009; Luscher and Lewis, 2008)
	Arbitrage	Engagement with alternative logics without compromising an actor's own logic	(Perkmann, Salter and Tartari, 2011)

Paradox has only recently been deployed in the context of impact, with Bartunek and Rynes' (2014) suggestion that paradoxes of performing (stemming from multiple stakeholders whose differing demands result in competing strategies and goals) and belonging (driven by complexity and plurality, as individuals and groups seek both homogeneity and distinction) are associated with the academic-practitioner gap.

2.4.1 Limitations

Paradox offers a fruitful perspective on how micro and meso-level behaviour is mediated by tensions, but is almost untapped in impact contexts. Hence, in order to increase understanding of impact, there is a need to deploy paradox theory, and particularly tension responses, in empirical studies.

2.5 Summary

This chapter positioned the research topic within four research streams, institutional logics, embeddedness, impact-related tensions drawn from the fields of SPIS, STS and innovation studies, and tension responses drawn primarily from paradox studies. The below table (Table 2-8) summarises this chapter's insights and outlines the associated research gaps. The next chapter unites these concepts and formulates the study's research question on their basis.

Table 2-8 Overview of relevant literature

Literature domain	Examples	Implications	Limitations
Institutional logics	(Thornton, Ocasio and Lounsbury, 2012)	Progressive coherence concerning a binary societal system of professional and market logics Incompleteness problematisations concerning focus on knowledge commercialisation involving physical, life or applied sciences within elite HEIs Incommensurability problematisation concerning institutional pluralism as the only source of contradictory logics	Limited or no exploration of impact beyond knowledge commercialisation, involving social sciences, arts and humanities research and across a range of HEIs
Embeddedness	(Ballet and Pouchain, 2015; Beckert, 2005; Dacin, Ventresca and Beal, 1999; Granovetter, 1992; Knorr-Cetina and Preda, 2001; Nahapiet and Ghoshal, 1998; Ng and Feldman, 2007; Nielsen, 2005; Zukin and Dimaggio, 1990)	Incompleteness problematisations concerning focus on knowledge commercialisation involving physical, life or applied sciences and on social (relational and/or structural) embeddedness in impact contexts	Limited or no exploration of other forms of embeddedness in impact contexts, or reconciliation with logics perspectives of impact
Tensions within SPIS, STS and innovation studies	(Hackett, 1990, 2005; Merton, 1973; Mitroff, 1974; Ziman, 1996)	Focus of empirical studies on cultural tensions between academia and practitioners, lack of reconciliation between the domains	Limited empirical explorations beyond the academic-practitioner dyad
Paradox theory	(Bartunek and Rynes, 2014; Lewis and Smith, 2014; Smith and Lewis, 2011)	Largely conceptual focus at organisational level	Rarely deployed in impact contexts

3 CONCEPTUAL DEVELOPMENT

This chapter conceptualises the notion of impact-related tensions which emerge as a consequence of conflicting, contradicting or converging institutional logics. As illustrated in Table 2-4, deployments of institutional logics in impact contexts predominantly assume an institutionally pluralist social system consisting of two logics, academic (professional) and commercial (market). Occasionally, a ternary system is envisaged, for example with the inclusion of a state (Lind, Styhre and Aaboen, 2013) or medical logic (Berggren and Karabag, 2019). Typically, these papers describe the social mechanisms involved, while leaving implicit the type of logics change (Thornton, Ocasio and Lounsbury, 2012, p.164) and the specific tensions which arise.

3.1 Conceptual framework development

In seeking to address the research question, a conceptual framework which relates structure and process is required (Strauss and Corbin, 1998, p.127). Process relates the action/interaction over time of persons, organisations, and communities in response to certain problems or issues. Structure creates the circumstances in which problems, issues, happenings or events pertaining to a phenomenon arise. Both must be studied to answer how and why events occur.

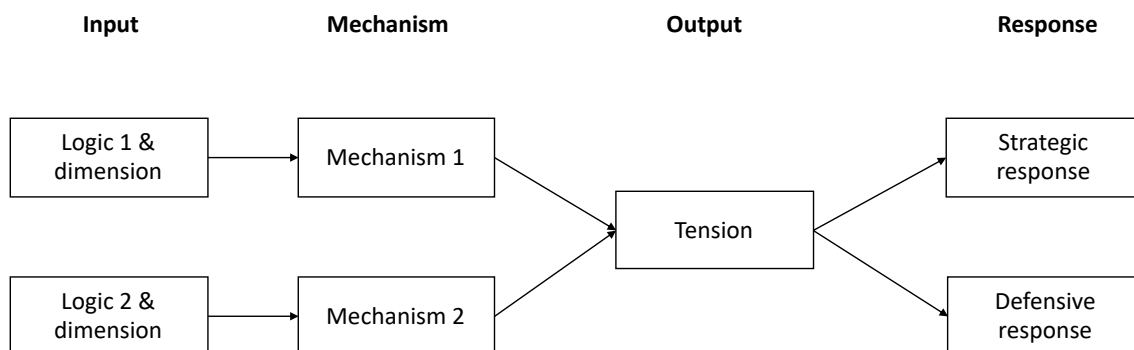


Figure 3-1 Conceptual framework

Here, a simple input-mechanism-output-response model was adopted, linking structure and process, and retaining the idea of a binary or ternary social system (Figure 3-1). Definitions of each component are listed in Table 3-1, as well as references to current knowledge of each as outlined in Chapter 2.

Table 3-1 Components of conceptual framework

Component	Description	Reference
Inputs	Institutional logics and the dimensions across which they interact	Table 2-2
Mechanisms	Social mechanisms of institutional generation, reproduction or transformation	Table 2-3
Outputs	Impact-related tension	Table 2-1
Response	Response of actors to the tension	Table 2-7

3.2 Summary

This chapter developed the concepts needed to form the research question. However, this conceptualisation remained tentative and needed to be empirically investigated. Therefore, the next step is to present the methodology used to address the research question.

4 METHODOLOGICAL CONSIDERATIONS

This chapter presents a discussion concerning the deployed method and instruments aimed at addressing the research question. It begins by examining the research philosophy, research design, data collection and qualitative data analysis methods, shedding light on the perspectives and approaches used in this study.

4.1 Philosophical perspective

Research orientations are inextricably linked to philosophical preferences, which are in turn influenced by the embedded collective histories and cultural traditions within which our own individual identities have emerged (Chia, 2002, p.3). Therefore, in order to establish the legitimacy and reliability of findings and conclusions, an elaboration of the philosophical perspective adopted is warranted.

4.1.1 Ontology

Ontology is concerned with the nature of social entities (Bryman and Bell, 2011, p.20). Two broad positions are evident in ontological debate, that reality exists independently of the observer or is socially constructed by actors. A continuum of ontological perspectives exist between these extremes (Cunliffe, 2010; Easterby-Smith, Thorpe and Jackson, 2012, pp.18–20; Morgan and Smircich, 1980). A realist or objective ontology holds that reality is concrete and external, and that facts can only be uncovered by direct observation of phenomena. A relativist or subjective ontology holds that reality is a historically, socially and/or linguistically situated experience. Multiple truths are possible, constructed through discussion and agreement between protagonists, and researchers may only explore these constructions through language, symbols and texts. A nominalist or intersubjective ontology holds that there is no truth, but rather ephemeral shared meanings between protagonists.

4.1.2 Epistemology

Epistemology is the study of inquiry into the nature of the physical and social worlds (Easterby-Smith, Thorpe and Jackson, 2012, p.21). It deals with the methods and standards through which reliable and verifiable knowledge is produced. Two basic epistemological strategies have emerged, empiricism and rationalism, differing in how knowledge is created. According to Chia (2002, p.6), empiricism involves the explanation of universalities from the particulars of experience, but fails to provide an adequate account of the perceived regularities of nature by neglecting hidden universal causes. Rationalism involves the explanation of particulars in terms of universal and immutable laws and principles, but is unable to penetrate the thickness of empirical experience

Because of these perceived weaknesses, a variety of theoretical perspectives have emerged which attempt to combine the strengths of these two epistemological strategies (Easterby-Smith, Thorpe and Jackson, 2012, pp.22–24; Laughlin, 1995). Epistemologies rooted in Comtean positivism hold that truth claims and universal generalisations are accepted only if they can be verified by objective empirical observation and deductive reasoning rather than by subjective inference. The observer is regarded as being independent of the object of enquiry and observations are ideally value-free (Lacey, 1999). Large samples are typically required and generalisation is made through statistical probability. By contrast, social constructivist epistemologies hold that reality is determined by people rather than by objective and external factors. The observer, whose role is the appreciation of different meanings that actors give their experiences, is regarded as being part of the phenomenon under investigation. Laughlin (1995) identifies two main branches of constructivist epistemology, the Kantian/Hegelian and Kantian/Fichtean lines. The former is more objective, emphasising a material world in which understanding of and change in its design is possible and appropriate. Kantian/Fichtean epistemologies are highly subjective, holding that material existence is

uncertain and that if reality is a projection of the mind, critique is useless and change inappropriate.

The focus of this study is on the institutional logics that give rise to tensions in a research impact context. A realist/objectivist ontology and positivist epistemology are regarded as being unsuitable on two grounds. First, logics are defined as being socially constructed (Thornton and Ocasio, 1999, p.804) and are not directly observable. Second, tensions are also regarded as being socially constructed by actors, in addition to being inherent within systems (Smith and Lewis, 2011). A nominalist/intersubjective ontology and Kantian/Fichtean epistemologies were also rejected on two grounds. First, that such a choice may lead to the neglect of latent tensions that are “dormant, unperceived or ignored” by actors (ibid). Second, that logics are shared patterns of symbols and practices which provide meaning to actors (Thornton, Ocasio and Lounsbury, 2012, p.2). This is inconsistent with a Kantian/Fichtean perspective wherein there is no truth in the form of shared patterns of symbols and practices.

Consequently, a relativist ontology and relativist epistemology were chosen for this study, wherein reality is considered a historically, socially and/or linguistically situated experience and an account of the different meanings that actors give their experiences is the study’s purpose. Two features of relativism are critical to achieving this purpose, co-variance and shared meanings and concepts. Co-variance concerns claims that a phenomenon co-varies with an underlying independent variable (Baghrmian, 2014, pp.1–9). This study is premised upon a conceptual epistemic relativism wherein patterns of symbols and practices, and consequently tensions, co-vary with institutional logics. This premise is defensible within the boundaries of epistemic non-absolutism (truth claims are not absolute), epistemic relationism (claims are made only in relation to the accepted epistemic system) and epistemic pluralism (competing claims made through alternative epistemologies are not mutually exclusive) (Boghossian, 2011, pp.47–48). Secondly, that epistemic relativism processes reality through shared meanings and concepts enables the incorporation of a

range of perspectives drawn from diverse literatures, including institutional logics, paradox theory, SPIS, STS and innovation studies as outlined in Chapter 2. This study links these perspectives through case study-based empirical observations, generating interactions among these theories and fields.

4.1.3 Logic of enquiry

According to Blaikie (2007, p.3), the four major types of reasoning logic are deduction, induction, abduction and retroduction. Induction involves generalising from specific instances or cases, while deduction employs testing general ideas against specific instances or cases. Retroduction refers to the use of reason and imagination to create a model of structures and mechanisms that are assumed to produce empirical phenomena. Abduction involves the derivation of concepts and theories from actors' everyday conceptualisations and understandings.

An abductive logic of enquiry was chosen for this study for two reasons. First, as an exploratory study, the approach taken relied both on existing literature and on empirical observations, rather than on hypothesis. Second, the study is not founded upon a grand theory but rather employs middle range thinking (Merton, 1968, pp.52–3), on the grounds that the likelihood of a grand theory accounting for social phenomena “is wistful and incorrect quasi-scientific thinking of a highly questionable nature” (Laughlin, 1995). Abductions are *ampliative* and *uncertain*, which means that even if the truth of the premises is taken for granted, the conclusion may be false, and is therefore subject to further testing (Schurz, 2008). A researcher who uses abductive reasoning constantly moves back and forward between data and pre-existing knowledge or theories, making comparisons and interpretations in the search for patterns and best possible explanations (Charmaz, 2006, p.24). The researcher tries to be open and sensitive to the data, without rejecting pre-existing theoretical concepts and constructions. Theories are used, not to mechanically derive a hypothesis to test (as in deduction), but as a source of inspiration, seeing, and interpretation in order to detect patterns (Alvesson and Sköldberg, 2018, p.5).

4.1.4 Middle-range thinking

Middle-range theory is principally used in sociology to guide empirical inquiry (Merton, 1968, p.60). While grand theories are abstract and contain whole edifices of assumptions which are often not testable, middle-range theories are generalisable propositions that can potentially be tested empirically (Easterby-Smith, Thorpe and Jackson, 2010, p.107). Scholars adopt middle-range thinking in addressing narrow social concerns, which may subsequently support the discovery of grand theories, reflecting an incremental approach to grand theory development (Laughlin, 1995).

Laughlin argues that middle range thinking occupies an intermediate position between Comtean positivism and Kantian/Fichteian subjective idealism in terms of theory (ontological and epistemological positions), methodology (the nature and role of the observer in the discovery process) and change (intentionality through discovery of achieving change in the phenomena being investigated). Thus, middle range thinking is intended to avoid the weaknesses and preserve the strengths of these alternative theoretical approaches. This approach is founded upon theories regarded as “skeletal” (incomplete yet reasonable stable and allowing both flexibility and diversity in the discovery process) which may be enriched by the variety offered through empirical observations (particularly qualitative case studies) to offer reasonably conclusive conclusions.

Thus, middle-range thinking is well suited to the relativist ontology and epistemology of this study, legitimising generalisation and the use of prior theorising while enabling theory building (Laughlin, 1995). It also has implications for methodological choice, positioning the observer as part of the process of discovery and enabling reasonably conclusive conclusions tied to skeletal theory and empirical richness to be derived.

4.2 Research design

This chapter has already noted that the study applied a relativist, abductive, middle-range approach to identify and process knowledge. The next section expands on this description, indicating the type of data collected, research design, theorising strategy, and the unit and level of analysis.

The function of a research design is to ensure that the evidence obtained enables the research question to be answered as unambiguously as possible (de Vaus, 2001, p.9). The research design of this study is detailed in Table 4-1. This includes, though is not limited to, the five components of a research design which Yin (2009, pp.29–35) states are especially important.

Table 4-1 Research design

Component	Explanation
Research question construction	Neglect spotting
Propositions/Study purpose	Proposition not required on the grounds that this is an exploratory study Purpose: to identify why conflicting, contradicting or converging institutional logics give rise to impact-related tensions, and how academics respond
Study design	Multiple-case (holistic) design (Yin, 2009, p.46)
Unit of analysis	Impact-related tension
Aspect of analysis	Cognitive, hierarchal (structural & normative)
Level of analysis	Individual
Logic linking data to purpose	Within- and cross-case analysis
Criteria for interpretation of findings	See Section 4.2.6
Theorising strategy	Informed grounded theory and abductive analysis (Thornberg, 2012)

4.2.1 Research question

Sandberg and Alvesson (2011) have identified three main ways in which research questions are constructed from existing literature: confusion spotting, neglect spotting and application spotting. For this study, neglect spotting was employed to formulate a research question. Neglect spotting involves attempts to identify areas which have received little or no research attention, such as overlooked areas, under-researched areas or areas lacking empirical support.

As stated earlier, the research question chosen for this study is:

How and why do interactions between institutional logics lead to tensions in the context of research impact?

In Chapter 2, multiple tensions that have been explored in a variety of literature domains in impact-related contexts were discussed. However, the majority of these studies, particularly empirical studies, adopt a reified perspective of science wherein the “structural dependance of science on sponsors is backgrounded and turned into a ‘right’” (Rip, 2011, p.197). Indeed, impact as construed within REF2014 to a degree maintains the autonomy of academia from society by focussing only on research effectiveness (whether research has produced any outcomes and/or societal benefits) (Hinrichs-Krapels and Grant, 2016). Neither research efficiency nor equity are encompassed by REF2014’s definition of impact. Rip argues that this attitude is historically contingent upon the institutionalisation of certain sponsorship constellations and not from characteristics of science itself. As a consequence, a more holistic study of impact tensions in which scientific relevance holds no *prima facie* protection, has been neglected. This is the rationale for this study.

4.2.2 Research method

According to Yin (2009, p.8), the five main research methods are experiment, history, survey, archival analysis and case study. The choice of method is dependent upon three conditions, the type of research question posed, the

extent of control the investigator has over actual behavioural events, and the degree of focus over contemporary rather than historical events.

This study's focus on "how" and "why" questions concerning contemporary events, and the lack of investigator control over behaviour led to the elimination of experiment and history as potential research methods. Archival analysis was eliminated on the grounds that impact case studies were typically presented as linear and strategic narratives (Ní Mhurchú et al., 2017) which did not offer a comprehensive perspective on the tensions encountered during the generation of impact. Finally, survey was rejected as conceptions of tension and response were considered likely to include meanings unarticulated and unrecognised by participants (Lofland and Lofland, 1996, p.115). Case study, defined as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009, p.18), was therefore chosen as the most suitable research method for this study's purpose, and ideally suited to middle-range thinking (Laughlin, 1995).

A multiple case study design was chosen as this is generally regarded as more compelling and more robust than a single case (Yin, 2009, p.53). The number of cases chosen was selected on the basis of a balance between greater robustness and the level of resources and time required to carry out the study. A total of 30 cases was chosen, each case consisting of the experiences of focal academics of 32 REF2014 impact case studies, selected from a total pool of 432 submissions to the business and management UOA. This figure was in excess of the 4-10 specified by Easterby-Smith (Easterby-Smith, Thorpe and Jackson, 2010, p.99) for relativist studies, but was chosen due to the relative ease of accessibility of focal academics and for greater robustness, balanced against considerations of available time.

4.2.3 Proposition and purpose of the study

As this study is exploratory in nature, it is legitimate that it does not have propositions (Yin, 2009, p.28). However, an elaboration of the study's purpose is necessary in order to direct attention towards topics to be examined within the scope of study. The primary purpose of this study is to identify why conflicting, contradicting or converging institutional logics give rise to impact-related tensions, and how academics respond.

4.2.4 Research topic, unit, aspect and level of analysis

For the purposes of a focused inquiry into social phenomena, a refinement of the topic of analysis, consisting of the unit of analysis and aspect, is required (Lofland et al., 2006, p.121).

The unit of analysis is defined as the "entity that forms the basis of any sample" (Easterby-Smith, Thorpe and Jackson, 2012, p.65). This is not understood as being synonymous with the case study, as Grünbaum (2007) notes that Yin is inconsistent in differentiating between the two. For this study, a holistic multiple-case design was chosen (Yin, 2009, p.46), which involved choosing a number of case studies and exploring each for evidence of a single unit of analysis. In terms of what constitutes a unit of analysis, Lofland offers a typology (Lofland et al., 2006, pp.122–132), including social or cultural practices, non-routine or unanticipated episodes, encounters between actors, social identities, social and personal relationships, groups and cliques, organisations, settlements and habitats, subcultures and lifestyles. However, the logics perspective spans macro (field and societal), meso (organisational, group & dyadic) and micro (individual) levels. In order to explore logics-generated tensions instantiated at any of these levels, a unit of analysis that encompasses all social mechanisms identified in Table 2-2, which includes all of Lofland's typology, must be nominated. Therefore, the unit of analysis chosen for this study is the impact-related tension.

The aspect of analysis is the specific part of the unit of analysis that is the subject of interest (Lofland et al., 2006, p.132), such as cognitive (ideologies, rules, self-concepts and identities), emotional (feelings) and hierarchical (inequalities and stratification). This study concentrates on cognitive and hierarchical (i.e. structural and normative), though not emotional, aspects in order to maintain congruence with the focus of existing institutional logics literature.

Bernard (2000, p.46) recommends using the lowest level of analysis possible as data can be aggregated to a higher level but not disaggregated to a lower level. On these grounds, an individual level of analysis was chosen for this study. However, the logics perspective “is inherently cross-level” (Thornton and Ocasio, 2013, p.120), highlighting interplay between macro (field and societal), meso (organisational, group & dyadic) and micro (individual) levels. Thus, the individual level of analysis recognises that tensions may emerge due to conflicting or converging logics at any level, but are experienced by individuals due to the representation of these logics within social mechanisms.

4.2.5 Logic linking data to purpose

Data from the chosen case studies is linked to the purpose of the study following the two-step process detailed by Eisenhardt (1989). The first step is within-case analysis, encompassing a descriptive case study narrative, providing familiarity with each case as a stand-alone entity, followed by a synthesis of tensions and responses identified in each case. The second step is cross-case synthesis, done by searching for within-group similarities and intergroup differences among tensions and responses. This follows a replication logic of multiple case study designs (Yin, 2009, p.53), intended to avoid claims based on findings idiosyncratic to a particular case by seeking replication or contrast among several cases.

4.2.6 Criteria for interpretation of findings

According to Yin (2014, p.36), the selection of criteria for interpretation of findings is essential to demonstrate robustness of findings. For constructionist studies, “meeting tests of rigor is a requisite for establishing trust in the outcomes of the inquiry” (Guba and Lincoln, 1981, p.103). Miles and Huberman (1994, p.277) argue that this should be done on qualitative researchers’ own terms, rather than as an attempt to convince positivists of the accuracy, precision and unbiasedness of constructivist studies, and offer practical guidelines for judging the quality of qualitative research (1994, pp.278–280). Below, these guidelines are drawn upon with linked section references of this thesis to establish the rigour of this study.

4.2.6.1 Issues of objectivity/confirmability

This concerns the relative neutrality and reasonable freedom from unacknowledged research biases, or explicitness about existing biases, and emphasises the replicability of the study. These issues were addressed in a number of ways. First, the study’s methods and procedures are explicitly described in Section 4.2, offering a complete and auditable picture for how the work was carried out. Second, the sequence of how data were collected, processed, condensed and displayed for conclusion drawing may be followed (Sections 4.3 and 4.4). Third, conclusions (Section 7) are linked to data using displays (Section 5.3). Fourth, personal assumptions, values and biases of the researcher, and how these may have come into play during the study, are discussed (Section 7.8). Finally, study data have been retained and are available for reanalysis, and permission for this has been obtained from interviewees (Section 4.5).

4.2.6.2 Issues of reliability/dependability/auditability

This concerns whether the study’s process is consistent, stable over time and across researchers. Such issues are addressed in a number of ways. First, the

research question is clearly stated (Section 4.2.1), is founded upon limitations of existing literature (Section 2.5) and is congruent with the study design. Second, the researcher's role and status are explicitly stated (Section 4.5.4). Third, findings were demonstrated to show meaningful parallelism across data sources (Section 5.3). Fourth, basic paradigms and analytic constructs are clearly specified (Sections 2.2, 2.3, 2.1, 2.4 and 3). Fifth, data were collected across a full range of appropriate settings (UK HEIs) and respondents (focal academics of impact case studies) suggested by the research question (Section 4.3.1). Sixth, coding checks against defined constructs were made and a sample were verified through peer debriefing [discussing ongoing research practice in the field with a colleague to encourage reflexivity by challenging assumptions (Symon and Cassell, 2012, p.207)]. Seventh, data quality checks for informant knowledgeability were incorporated through case selection (Section 4.3.1). Eighth, the issue of convergence of multiple observer accounts was avoided by limiting field workers to one (myself). Finally, this thesis was peer reviewed by an internal panel of colleagues prior to submission.

4.2.6.3 Issues of internal validity/credibility/authenticity

This concerns the credibility and plausibility of the study. Internal validity, or the strength of a case-effect link made by a case study (Yin, 2014, p.239), is maximised through the use of three forms of triangulation (Patton, 2015, pp.661–676). Triangulation of data sources is achieved through the collection of data from different informants using a particular method (interview), and comparing and contrasting this with all other data sources collected using the same method. Methods triangulation is achieved by gathering data through two methods: semi-structured interviews and documentation-archival data (REF2014 impact case studies). Analyst triangulation is achieved by systematically reviewing the findings and using peer debriefing during data review. In addition, theories from multiple disciplines and perspectives are used to help explain findings.

In addition to triangulation, alignment between the concepts under study and observed evidence is strengthened by four analytical techniques. Case description involves detailed descriptions of the original sources of data (Section 5.1) followed by description of within-case coding assignments (Eisenhardt, 1989) supported by specific quotes from interviews (Section 5.2). Cross-case comparison of findings (Section 5.3) is undertaken to identify within-group similarities and intergroup differences in order to avoid claims based on idiosyncratic findings. Progressive subjectivity (Symon and Cassell, 2012, p.207) is done by maintaining a record of initial constructions and challenging these as researcher understanding developed. Member checking (Symon and Cassell, 2012, p.207) was done by testing the researcher's interpretation of the data with research participants throughout the research process.

4.2.6.4 Issues of external validity/transferability/fittingness concern

The external validity of a study concerns the extent to which findings can be generalised to other situations not part of the original study (Yin, 2014, p.238). What is at stake here is not a 'nomological' generality (Kaplan, 1973, p.91), or an assertion of enduring, context-free value intended to modulate efforts at prediction and control of a phenomenon (Lincoln and Guba, 2011, p.2). Instead, the intention is to establish conceptual generality (Glaser, 2006) (the use of other researcher's empirical findings in conjunction with the researcher's own process of conceptualisation in order to generalise and identify patterns) of the study. Conceptual generality avoids problems such as sample representativeness and spatial or temporal specificity associated with descriptive grounded theory generalisations as contextualised conceptual modification allows variation of categories to fit (Glaser, 2006, p.3,10).

Miles and Huberman's (1994, pp.278–280) guidelines are used to establish external validity. Characteristics of the sample population have been described to permit adequate comparison with other samples, and sampling has been theoretically diverse enough to encourage broader applicability (Section 4.3.1). Findings have included thick descriptions (Geertz, 1973) for readers to assess

potential transferability and appropriateness for their own settings (Section 5.2). The congruence of findings with prior theory has been discussed (Chapter 6). Processes and outcomes described in this study are applicable in comparable settings (i.e. impactful research in business and management fields in UK HEIs). Suggested settings where the findings could be fruitfully tested further are discussed (Section 7.7). The ability to generalise to other settings has been critically examined (Section 7.6.1).

4.2.7 Theorising strategy

A theorising strategy describes the approach to generating theory from data. A variety of theorising strategies have been developed for the purpose of analysing natural language data, including content analysis, grounded analysis, social network analysis, discourse analysis, narrative analysis, conversation analysis and argument analysis (Easterby-Smith, Thorpe and Jackson, 2012, pp.162–207).

For this study, given the exploratory nature of the research involved, the variety of conceptual approaches to tensions in an academic research context and the dearth of supporting empirical studies for many of these conceptual approaches, a form of grounded analysis was adopted as theorising strategy. Grounded analysis is based on grounded theory (Glaser and Strauss, 1967), which emerged as a challenge to deductive approaches to research predominant in the mid-20th century US. Grounded theory eschews theory testing and instead emphasises an inductive process with an intimate involvement between theory generation and the process of research. The defining components of what has come to be known as “classic” grounded theory practice are simultaneous data collection and analysis; a bottom-up construction of analytic codes and categories from data; making comparisons during each stage of the analysis (the constant comparative method); advancing theory development during each step of data collection and analysis; memo-writing to elaborate categories, specify their properties, define relationships between categories, and identify gaps; sampling aimed toward

theory construction, not for population representativeness and finally conducting the literature review after developing an independent analysis (Charmaz, 2006, pp.5–6).

However, classic grounded theory was rejected for the purposes of this study because of Glaser and Strauss' (1967, p.37) recommendation "literally to ignore the literature" in order to avoid contamination by existing theory. This recommendation has been criticised elsewhere on various grounds, including disallowing research in areas familiar to the researcher, running the risk of reinventing the wheel, missing well-known aspects, repeating others' mistakes or making trivial contributions (Charmaz, 2006, p.165; Thornberg, 2012). Although it could be argued that the *tabula rasa* approach of classic grounded theory is ideally suited to a doctoral research project, the researcher's relative inexperience in qualitative methods would leave this study open to such criticisms.

Instead, informed grounded theory was chosen (Thornberg, 2012) as the theorising strategy for this study, in order to take advantage of relevant, pre-existing concepts and research findings in a sensitive and flexible way. Informed grounded theory is consistent with later constructivist approaches to grounded theory (Bryant, 2002; Charmaz, 2000) in that it is based on abduction, rather than pure induction (Pierce, 1958). In practice, this involved the incorporation of a number of data sensitising principles which governed the use of literature. Theoretical agnosticism (Henwood and Pidgeon, 2003, p.138) was employed by which existing literature concepts were used as sources of inspiration rather than canonical decree, enabling best possible explanations to be made in interpretation of data. Theoretical pluralism (Midgley, 2011) was employed, whereby different theoretical perspectives were drawn upon to inform interpretation. Theoretical sampling, "the process of data collection...whereby the analyst jointly collects, codes and analyses his data and then decides what data to collect next and where to find them, in order to develop (emerging) theory" (Glaser and Strauss, 1967, p.45), was also applied so that literature could be compared with emerging concepts.

4.3 Data collection

This section details the sequence of steps undertaken to gather data. These consisted of case selection and primary data collection.

4.3.1 Case selection

Case selection is the foundation of qualitative inquiry (Patton, 2015, p.265). It follows that purposeful or purposive sampling, the strategic choice of a sample case(s) among a population is critical in academic inquiry. The logic and power of purposeful sampling lies in selecting information-rich (those cases from which by their nature and substance will illuminate the inquiry question being investigated) cases for in-depth study. The case selection process therefore involved a number of scoping decisions, which are discussed below.

The first scoping decision involved setting boundaries to define case aspects relevant to the study's research question. The REF2014 impact case study database was chosen as the population of interest because, as the first national-level assessment of impact, it represents the most comprehensive qualitative database of academic impact in the world. The business and management UOA within this population was chosen as business and management have received little attention in explorations of impact or institutional logics. Thus, a mixture of boundaries applies to this study, imposed both by the conditions of REF2014 and by myself (Table 4-2).

The second scoping decision involved determining the sample size. A target of 30 cases was chosen, each case consisting of the experiences of focal academics of one or more REF2014 impact case studies, selected from a total pool of 432 submissions to the business and management UOA. This figure was in excess of the 4-10 specified by Easterby-Smith (Easterby-Smith, Thorpe and Jackson, 2010, p.99) for relativist studies, but was chosen due to the relative ease of accessibility of focal academics and for greater robustness.

The acceptance rate of academics asked to participate was approximately 50%, and this search phase proceeded until the target of 30 interviews was achieved.

Table 4-2 Boundary conditions

Boundary	Condition	Source
Geographical	Focal academic associated with a UK HEI	(HEFCE, 2012)
Temporal	Cases underpinned by research outputs produced between 1 January 2008 and 31 December 2013 Impacts achieved between 1 January 1993 and 31 December 2013	(HEFCE, 2012)
Disciplinary	Cases drawn from the REF2014 business and management UOA	Study design

Cases were selected on the basis of either literal replication (i.e. predicts similar results) or theoretical replication (predicts contrasting results but for anticipatable reasons). Two factors were considered in choosing case studies following this replication logic: the quality of research outputs and the quality of impact of the HEI. These were chosen as this information was publicly available and determined within the REF2014 exercise. Thus, cases were selected and categorised as either “high/low impact” subject to a mean threshold of 71% impact quality, and “high/low outputs” subject to a mean threshold of 54% outputs quality. A minimum of 6 cases were chosen in each quadrant (Figure 4-1). A description of both the focal academics and their HEIs is shown in Table 4-3.

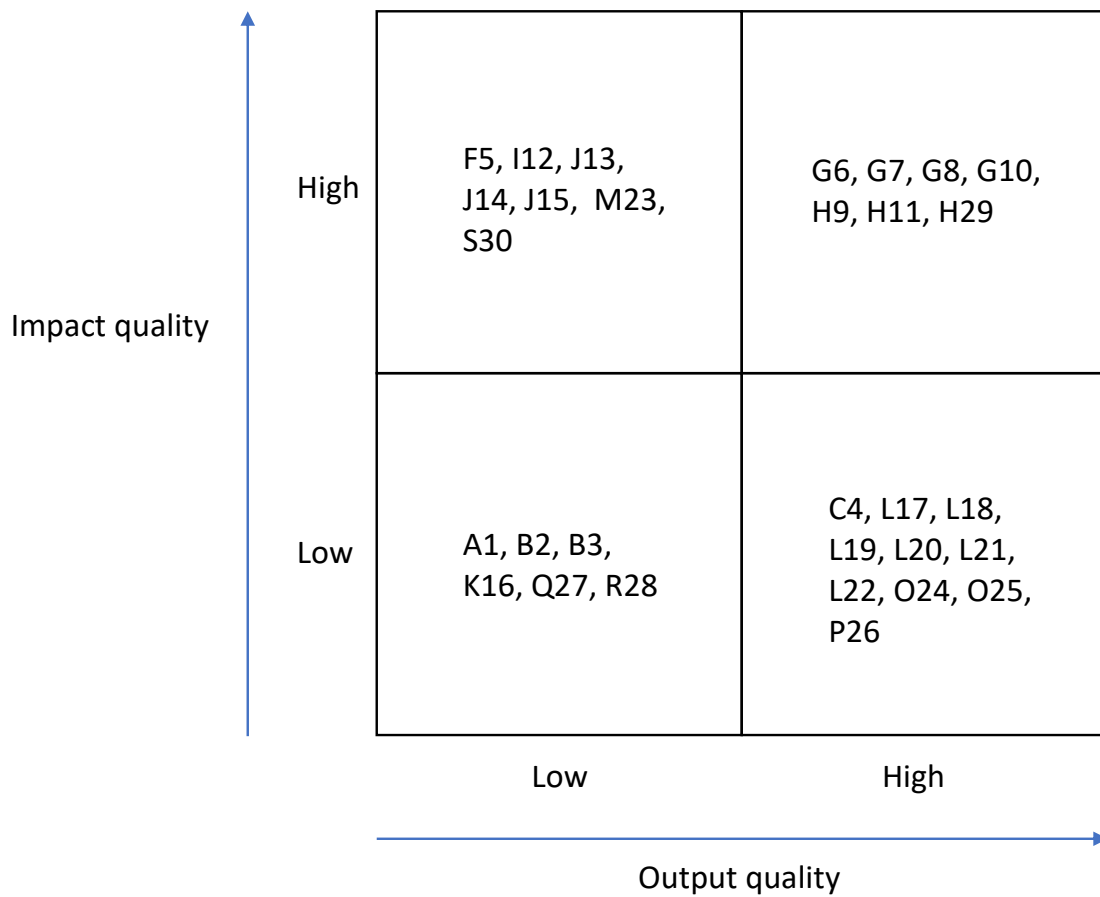


Figure 4-1 Case selection and replication logic

Table 4-3 Primary data collection: Description of cases

HEI	HEI description	Impact/ output	Case	Description of focal academic	Date interviewed	Mode	Duration
A	Post-1992 university	Low/Low	A1	Professor	02 May 2017	Face-to-face	1 hour
B	Post-1992 university	Low/Low	B2	Professor emeritus	18 May 2017	Face-to-face	1 hour
		Low/Low	B3	Senior lecturer	23 Jan 2017	Face-to-face	1 hour
C	Plate glass university	Low/high	C4	Professor	30 Jan 2017	Face-to-face	1 hour
F	Post-1992 university	High/Low	F5	Professor	28 Jan 2017	Skype	1 hour
G	Ancient university, Russell group member	High/high	G6	Senior lecturer	09 Mar 2017	Telephone	40 min
		High/high	G7	Reader	24 Feb 2017	Face-to-face	1 hour
		High/high	G8	Reader	27 Feb 2017	Face-to-face	1 hour
		High/high	G10	Principle researcher	30 May 2017	Face-to-face	1 hour
H	Public research university, Russell group member	High/high	H9	Senior lecturer	01 Mar 2017	Face-to-face	1 hour
		High/high	H11	Professor	21 Apr 2017	Face-to-face	1 hour
		High/high	H29	Professor	16 Jun 2017	Skype	30 min
I	Post-1992 university	High/Low	I12	Professor	03 Apr 2017	Skype	1 hour
J	Red brick university, Russell group member	High/Low	J13	Associate professor	03 May 2017	Face-to-face	1 hour
		High/Low	J14	Professor	05 Apr 2017	Face-to-face	1 hour
		High/Low	J15	Professor, head of school	04 Apr 2017	Face-to-face	1 hour

HEI	HEI description	Impact/ output	Case	Description of focal academic	Date interviewed	Mode	Duration
K	Post-1992 university	Low/Low	K16	Professor	19 Apr 2017	Face-to-face	1 hour
L	Plate glass university, Russell group member	Low/high	L17	Associate professor	15 Mar 2017	Face-to-face	1 hour
		Low/high	L18	Associate professor	11 Apr 2017	Skype	1 hour
		Low/high	L19	Professor, head of school	11 Apr 2017	Face-to-face	1 hour
		Low/high	L20	Professor	27 Mar 2017	Skype	1 hour
		Low/high	L21	Professor	18 Apr 2017	Face-to-face	1 hour
		Low/high	L22	Professor	20 Apr 2017	Skype	1 hour
M	Post-1992 university	High/Low	M23	Professor	12 May 2017	Face-to-face	1 hour
O	Post-1992 university	Low/high	O24	Professor	12 Jun 2017	Skype	1 hour
		Low/high	O25	Professor	08 Jun 2017	Skype	1 hour
P	Public research university, Russell group member	Low/high	P26	Professor, head of school	30 May 2017	Face-to-face	30 min
Q	Post-1992 university	Low/Low	Q27	Professor	20 Jun 2017	Face-to-face	1 hour
R	Post-1992 university	Low/Low	R28	Professor	14 Jun 2017	Face-to-face	1 hour
S	Post-1992 university	High/Low	S30	Reader	21 Jun 2017	Skype	1 hour

4.3.2 Primary data collection activities

The primary data collection phase involved interviews with focal academics, conducted face-to-face, by Skype or telephone. All interviews were scheduled in advance via email, which also noted that with the participant's consent, interviews would be audio-recorded (du Bois et al., 1993), facilitating the creation of interview transcripts. All participants indicated their satisfaction with these provisions. All but three interviewees agreed to an interview duration of approximately 1 hour, with the exceptions (G6, I12, P26) agreeing to interviews of about 30-40 minutes due to their schedules. A summary of field data collection is shown in Table 4-4.

Table 4-4 Field data summary

HEI	Case
Method	Semi-structured interviews (face-to-face, Skype, telephone)
Time period	23 Jan to 21 Jun 2017
Total number of interviews	30
Interview duration range	30 minutes to 1 hour
Average interview length	Approximately 1 hour
Total material collected	28.5 hours of recordings, 30 transcripts

A research protocol was created that contained questions regarding experiences of impact-related tensions and responses (Appendix C). This was modified and improved over time, based on interview experience, theoretical sampling and peer debriefing.

4.4 Data analysis

Qualitative data analysis took place concurrently to data collection. This began with transcription of 28.5 hours of interview recordings, resulting in 30

transcripts. Next, all of the data was imported into NVivo 11, which supported the subsequent analysis. Overall, the analytical process consisted of two steps: creating the coding frame and analysis. The following sub-sections explore these phases in further detail.

4.4.1 Coding frame development

The development of the analytical coding frame was done over a number of stages, drawing upon the procedures described by Strauss and Corbin (1998, pp.55–217) and Thornberg (2012). These were carried out consecutively and iteratively, but are described sequentially below for simplicity. In the first stage, a provisional start-list of *a priori* categories was constructed, based on tensions identified in Section 2.1. This was supplemented by microanalysis, where interview transcripts and fieldnotes were read in detail with an open mind to identify passages that appeared particularly noteworthy and relevant. Holistic coding (Saldaña, 2013, p.64) was employed both because it is suitable for exploratory studies in order to obtain a “grand tour” overview and because it was useful in linking together the structural and process elements of tensions for subsequent coding levels. This prompted a return to the literature to identify additional plausible categories, including known tensions or poles of possible tensions, explored both within and outside an academic research or impact context (Appendix A). Furthermore, it enabled potential new categories to be inferred.

The second stage began with open coding (Strauss and Corbin, 1998, pp.101–122), where data were broken down into concepts or abstract representations of an event, object or action/interaction identified by the researcher as significant. Similar phenomena, as identified through comparative analysis, were placed in the same conceptual code. Conceptualisations drew from institutional logics (Table 2-2), social mechanisms (Table 2-3) and paradox theory (Table 2-7) as these had established analytic meanings and had relevance to the study (Strauss and Corbin, 1998, p.115). This was followed by categorisation which involved the grouping of concepts under a higher-order category (holistically

coded tensions) through the process of constant comparison, based on the category's ability to explain what is going on. Category dimensions, the range along which general properties of the category varied (ibid, p.101), were also identified based on data analysis and reference to the literature.

The third stage involved axial coding (Strauss and Corbin, 1998, pp.123–142), wherein categories were related to subcategories to form more precise and complete explanations about phenomena. Subcategories are categories which answer questions about a phenomenon, rather than standing for the phenomenon (Strauss and Corbin, 1998, p.125). The aim was to contextualise the phenomenon, to locate it within a conditional structure and to relate this to the process by which tension responses are elicited. Axial coding was carried out using the coding paradigm approach (Strauss and Corbin, 1998, p.128) based on the study's conceptual framework (Figure 3-1), wherein for each tension category, the generative conditions (authority, identity and legitimacy dimensions of institutional logics) were assigned.

The fourth stage involved selective coding (Strauss and Corbin, 1998, pp.143–162), the process of selecting a core category and systematically relating this to other categories in need of further refinement, organised along a storyline of the theory under development. This again involved using the coding paradigm, though at a higher level of abstraction. This stage drew heavily on embeddedness concepts detailed in Table 2-5. Again, this prompted a return to the literature to expand on the types of embeddedness currently associated with the logics perspective.

Table 4-5 describes the development of the coding frame in more detail, indicating which concepts underwent revision. It demonstrates the key themes investigated, including specific dimensions (legitimacy, authority and identity) of interacting institutional logics; social mechanism of institutional generation, reproduction and transformation; impact-related tensions and tension responses.

Table 4-5 Coding frame development

Conceptual framework component	Initial frame	Reason	Reference	Conceptual development
Input	Institutional logics & dimension	Identify structural element of tension at level of social system	Table 2-2	Maintained
Mechanism	Social mechanisms	Identify structural element of tension at macro, meso & micro levels	Table 2-3	Extended by 10 mechanisms (Section 6.4)
Output	Tension	Identification of tension	Table 2-1	Initial shortlist of 30 tensions identified by systematic & manual literature review extended by 15 tensions via theoretical sampling and 3 by empirical observation
Response	Tension response	Identify process elements of tension	Table 2-7	Maintained
Core categorisation	Embeddedness	Identify theory of action	Table 2-5	Types of embeddedness associated with logics perspective extended by 5

4.5 Ethical considerations

This study was conducted in accordance with Kvale and Brinkman's (2009, pp.70–76) four guidelines to address ethical uncertainty, which are explored below.

4.5.1 Informed consent

Informed consent involves informing the research participants about the study's overall purpose and main features of the design, as well as communicating any risks and potential benefits of participation. It further involves obtaining voluntary participation of the people involved and informing them of the right of withdrawal at any time.

For this study, participants were asked to sign, or in the case of telephone or Skype interviews to indicate their recorded agreement with, a consent form (Appendix D) which explained these rights. Participants were also provided with an information sheet (Appendix E) prior to interview.

All participants agreed with the consent form, including that data would be accessible to other researchers on condition of the maintenance of confidentiality. All participants indicated that they wanted to maintain anonymity in this thesis and subsequent research outputs based upon this work.

4.5.2 Confidentiality

Confidentiality implies that the private data identifying the participants will not be disclosed, and that where information may be recognisable to others, the participants should agree to the release of this identifiable information (Kvale and Brinkman, 2009). For this study, both the names and affiliations of all participants are anonymised, while descriptive information is recorded in Table 4-3.

4.5.3 Consequences

Consideration of the consequences of a qualitative study is necessary to ensure that any potential harm to the participant should be minimised and that the overall benefits accruing from the research should outweigh any potential harm. This means that the balance between benefits and risks should be considered.

The benefit of this study was an understanding of impact-related tensions and responses. The offer was made to all participants that the study's findings would be shared with them. Most of the participants expressed an interest in these findings being communicated with them, and this will be done upon submission of this thesis.

The risks to participants or their affiliated HEIs posed by non-attributable comments were assessed as minimal. Occasionally, data which the participant regarded as sensitive has been withheld at their request.

4.5.4 The role of the researcher

The role of the researcher is critical to the quality of knowledge obtained. The integrity of the researcher is especially important in interviewing as the researcher is the instrument for obtaining scientific knowledge.

Potential influences on the independence of the researcher were identified at the outset. The research study is sponsored by Cranfield University through a bursary, and because of this, participants from Cranfield were not sought. The researcher had no relation to any of the participants or their affiliated HEIs, in terms of a specific role or status. No participant or HEI sought to apply constraints or restrictions on the study. The researcher's integrity was maintained throughout the study by transparency of purpose, by informing participants of the study's details and by honouring commitments made to participants.

4.6 Summary

This chapter reviewed the methodology adopted in this study. It clarified the research philosophy and design, as well as the data collection and analysis processes, and ethical considerations. The next chapter presents the study's empirical findings.

5 FINDINGS

This chapter presents the case narratives, analyses, and research findings. A brief summary of 30 case narratives is given, taken from the impact case studies submitted to REF2014 (HEFCE, 2014), describing how impact was underpinned by academic research within business and management fields. This is drawn from relevant REF2014 impact case studies. Next, the analytical coding frame is discussed, based on a qualitative cross-case analysis wherein tensions, generative conditions (logics and social mechanisms), actions/interactions (responses elicited to tensions) and overarching theme (embeddedness) are identified.

5.1 Case narratives

Case A1: A body of research on migrant workers and trade unions, undertaken by the university's Global Economy and Business Research Unit from 2006 onwards, contributed to improving workplace equity, inclusion and societal cohesion following the mass and super-mobile migration to the UK from the EU's New Member States, and Poland in particular. The impact occurred at regional, national and European level through influencing policy-making processes and forums. A range of stakeholders and practitioners benefited, principally large trade union organisations and their clients.

Case B2: Research on organic agriculture and organic food production in China by B2 has contributed to the successful (re)adoption of organic agriculture there over the last twenty-odd years. With the formation of the Organic Food Development Centre under the auspices of the then State Environmental Protection Agency (now the Ministry of Environmental Protection) in 1994, the Chinese government officially began the arduous task of persuading farmers to forgo conventional, chemical-based agriculture in favour of organic farming. From a negligible base, China now has more farmland sown to organic crops than any developing country and the highest percentage share (0.8%) of any medium/large developing country. Organic farming has not only led to environmental benefits but also to poverty reduction and eco-tourism in parts of the Chinese countryside. These successes result from changes in government policy and institutional change which have been encouraged through

B2's research and published papers, and through face-to-face contact with significant stakeholders.

Case B3: The university's social enterprise research has created new knowledge in the field of social entrepreneurship, which has informed the definitional debate, as well as identifying the added-value that social enterprises deliver to their beneficiaries. This has provided the evidence-base for the launch of a whole-institution strategy at the university to become the leading HEI for social enterprise in the UK. The research has also led to the university supporting external social enterprises and assisting them to deliver organisational growth and change.

Case C4: In 2012 the Department for Business, Innovation and Skills (BIS) identified the constant, ratcheting up of executive pay as unsustainable. In addition to informing this call to action, C4's research, in collaboration with PricewaterhouseCoopers (PwC), has changed how senior corporate decision-makers design and implement long term incentive plans. Adopted by PwC, this research has influenced the company's own reward policies and those of its international client network. The work has been part of policy debates and has been cited by BIS and the Financial Services Authority.

Case F5: The Centre for Business, Innovation and Enterprise (CBIE) has conducted extensive research that has significantly, positively impacted upon the health and safety management of plant and machinery, throughout businesses in the UK and internationally. The outputs of this research are firmly embedded within an academic multi-collaborative framework that has profited from tangible contribution via partnerships with business, industry and government stakeholders. The impact has benefitted original equipment manufacturers (e.g. JCB); the equipment supply chain (e.g. Hilti UK Ltd., A-Plant plc.); end users (e.g. the US and UK armed forces); and society at large, by making people's workplaces safer.

Case G6: G6 is recognised as a pioneer of Open Innovation thinking within the UK public sector. He has influenced a major shift in thinking in ICT-driven public service design towards open innovation, with demonstrable impact on public and private sector business models. His 2009 paper for George Osborne launched a seismic change in thinking by government policy-makers, public servants, and private sector service providers. G6 became a Cabinet Office advisor in 2011, and continues to

provide critique and contribution to parliamentary reports and policy documents across government and industry, and support implementation within local government.

Case G7: Research examining the regulation of energy network utilities in the UK carried out by G7 and associate during 2006-2008 was a significant motivation for and contribution to the RPI-X@20 Review of regulation carried out by the UK electricity regulator, Ofgem, between 2008 and 2010. Both G7 and associate carried out additional research which was fed into the RPI-X@20 consultation process. The review subsequently recommended the adoption of a new system of network regulation which is being implemented by Ofgem. The underlying principles are also being adopted by UK water regulators.

Case G8: G8's research in developing the PAGE2002 model of climate change has been used extensively by government agencies in the UK and US, as well as the IMF and the international community in order to improve their calculations for global carbon emissions and setting carbon emissions targets. The model was used in the UK government's Eliasch Review, in order to calculate the costs and benefits of actions to reduce global deforestation; by the US Environmental Protection Agency, in order to calculate the marginal impact of one tonne of CO₂ emissions; and the IMF, whose calculations using the PAGE2002 model form the basis for their guidance on carbon pricing.

Case G10: G10's research undertaken since 1998 on strategic technology management resulted in a principled and generalised method of creating roadmaps for technology and innovation management. This research was developed into a complete toolkit through case studies and consulting by a wholly-owned subsidiary. Organisations in 26 countries commissioned over 115 consulting projects during 2008-13, benefiting through improved business performance and practices, the adoption of new technologies or processes and the better alignment of technology strategies with policy and commercial imperatives. Revenue from consulting, publications and events based on the research findings was £3,479,758 in the period.

Case H11: Although essential for coping with escalating health and social care demands, adoption of 'remote care' – telecare and telehealth – has been slow. H11's

research group provided evidence to establish how remote care can be sustainably and efficiently embedded into healthcare. They then helped design and evaluate the Department of Health's Whole System Demonstrators, the world's largest trial of remote care. As a consequence, the government launched the 3 Million Lives programme in January 2012, with an estimated potential net benefit to the NHS of £450m over the next 5 years. Research taken up by the Audit Commission and DTI has further influenced UK remote care policy by developing the evidence base and evaluating gaps in basic research.

Case H29: Regulating telecommunications has been difficult for policy-makers, who must balance freedom for business operation with fairness and value for consumers. Termination rates - the cost of ending phone calls using other networks - have been particularly contentious. H29's work helped regulators, including Ofcom, to model the processes involved and thereby improve regulatory pricing guidelines. By developing a new theory of regulation - how dynamic incentives price regulation - this research has influenced policy in both UK and international telecommunications markets.

Case H9: The Global Entrepreneurship and Development Index (GEDI) has been designed to address the shortcoming that policy makers lack robust measures for effective guidance for national entrepreneurship policy analysis, design and implementation. GEDI profiles National Systems of Entrepreneurship. The main impact has been as follows: Scottish Enterprise used GEDI analysis to re-think its entrepreneurship policy; UNCTAD adopted GEDI in its Entrepreneurship Policy Framework; in 2013, EU decided to include GEDI data in the 2014 EU Cohesion Report, which will determine the allocation of EU Structural Funds (€320 Billion). The ultimate beneficiaries of more effective policies are the businesses, taxpayers, and populations of these countries.

Case I12: I12 submitted two impact case studies to REF2014. The impact in the first is based on 20 years of research, dissemination and interactions with policy-makers and practitioners. It culminated in the OECD/APEC Athens action plan (2008) which currently drives global policy on support for SME internationalisation, the establishment of a new School of Entrepreneurship and Management at the Romanian Academy of Economic Studies and generated 132 new entrepreneurial businesses (2010-13). This led to a Barclays-funded project in South Africa (2012) to

support the internationalisation of 30 local businesses. The research has therefore resulted in improved SME performance and entrepreneurial management which drives economic growth nationally and globally. In the second case study, the underlying research by I12 and associate successfully made the case for regional support to encourage and stimulate export activity. Following on from this work, the CURA-B project has had impacts for SMEs, economic support agencies, key customers and knowledge centres in the Assistive Technology (AT) sector. I12 and associate have worked with SMEs, economic support agencies and key customers in coaching and consultative roles and through hosted large-scale engagements. They have helped shape the ecology of the support infrastructure now being put in place in the East of England, West Flanders, Nord-Pas-de-Calais and Zeeland.

Case J13: Key findings from J13's research into global engineering networks (GEN) have been adopted by some of the largest manufacturing firms in the UK, leading to measurable improvements in the effectiveness and efficiency of their engineering functions. The programme of research combines engineering, technology and process management and wider insights from organisation studies to develop decision-making tools for firms. One important route for disseminating GEN research findings to industrial audiences has been the High-Performance Engineering Forum; member companies of the Forum have achieved tangible benefits from application of the approach including reduced engineering expenses, improved communication, support for novel working approaches and the introduction of innovative business initiatives. Users cite the benefits of these tools in support of the formation and implementation of global engineering strategies and improved communication between operations at different stages of the engineering value chain. There is also evidence of wider impact in terms of the increased awareness of the need to combine engineering and technology-related expertise with innovation management capabilities and knowledge of the changing international landscape. The research focuses on emerging competitors, growing markets and potential collaborations, particularly in, from, or with China. These have significant implications for current manufacturing business models in the UK. The GEN framework has also been adopted as an essential input for the Excellence Engineering Education System in China co-developed by the Chinese Academy of Engineering, Cambridge University

and Tsinghua University, and intended to provide a novel framework for Chinese engineering education.

Case J14: The EU KLEMS project, of which J14 was a leader, resulted in impact on two groups of users: statistical offices in EU member states and the policy community tasked with analysing and promoting economic growth, such as finance ministries and central banks. The research team demonstrated how to derive productivity statistics at the industry level, highlighting how to make best use of information already in national accounts and fill gaps in the available data. This led to the formation of a Eurostat EU-KLEMS Task Force. The task force recommended that productivity measures be introduced in national accounts; this is currently being implemented by statistical offices across the EU, drawing from the methodology proposed in the research. In the meantime EU KLEMS is being used by policy makers, especially central banks and finance ministries, to inform policy interventions designed to raise economic growth.

Case J15: Widespread concern about the effects of excess alcohol consumption by young people has been the focus of extensive national debate. The drinks industry has paid growing attention to these issues; corporate social responsibility measures by both individual companies and industry bodies show evidence of a more sophisticated appreciation of how marketing can be used to address the problem. This is evident in publications of the major drinks companies and the continual updating of recommendations to industry by the Portman Group. Findings from research into young people, alcohol consumption and social identity research have informed public, policy and industry debates and have shaped control measures, in particular by highlighting the social versus individual responsibility issues around so-called binge drinking. J15, a lead researcher on this project, has subsequently been directly involved in enhancing corporate social responsibility activities within the alcohol industry through industry and policy wide debates such as a St. George's House consultation on alcohol and has been appointed as one of nine members of the Portman Group Independent Complaints Panel, which adjudicates on complaints made under the industry Code of Practice on the marketing of alcoholic products in the UK.

Case K16: As evidenced in policy documents and practitioner testimonies, the case study has had a significant impact on EU and national VET (vocational education and training) policy through: modifying the European Qualifications Framework (EQF) and associated terminology – including learning outcomes, skills, and competences – and influencing implementation in terms of sectoral alignment and the establishment of Zones of Mutual Trust. Based on two major research projects, the case identifies the difficulties and possibilities to establish equivalence of occupational qualifications and has been widely disseminated to reach major stakeholders, including the European Commission, trade unions, employers and VET organisations.

Case L17: The research conducted by L17 provided the first reliable benchmark study of how age and gender affects the employment realities of professional performers across Europe. The research has influenced the practices of professional bodies, resulting in trade union organisations changing their codes of practice and introducing new measures designed to address age and gender inequality. The research provided a concrete resource for international performers' unions to use in employer negotiations and contributed to political debate and led to a House of Commons Early Day motion on gender inequality in the arts. It also led to the launch of an online petition receiving over 10,000 public signatures, and triggered the creation and implementation of the EU Sectoral Social Dialogue Committee's Framework of Actions.

Case L18: International evidence suggests that small firms provide the main source of new jobs in almost all economies. Policy support can be important in fostering and facilitating SME growth. L18 and associates have helped the UK government and regional economic development agencies to develop, implement and evaluate new policy initiatives for supporting SME growth. Building on the UK research, and partnering with the OECD, this research has shaped SME policy development and evaluation in the Western Balkans as countries have sought to upgrade their SME support regimes and align their policy frameworks to those of the European Community.

Case L19: Interdepartmental research has provided new models and techniques for understanding and improving hospital processes and has been adopted by four NHS

Trusts in England, informing their services and professional practice as well as enabling more efficient decision making. Research findings have been used to develop the SimLean concept, a simulation approach for use in hospitals. SimLean was developed in order to educate healthcare staff about lean principles and has been adopted commercially by the global company Simul8 as a platform for further development. Significantly, this research has also informed the national strategy for service improvement in the NHS.

Cases L20 and L21: Pathways that individuals navigate through education, training and employment are becoming ever more complex and high-quality labour market information is crucial for careers advice and in informing decisions about where to invest in skills training. Research undertaken by L20, L21 and others has resulted in new policy frameworks for systems design and delivery of careers services; and has informed professional development in careers policy, research and practice. Internationally, their centre has informed and shaped policy debate and practice on career development services in response to political, economic, technological and social changes.

Case L22: The UK's adoption, and implementation in 2004, of the EU's Information and Consultation of Employees (ICE) Directive had profound implications for industrial relations in the UK, which historically had no provision for works councils (a representative structure where management meet with employee representatives to discuss working conditions). L22's research on the impact of the ICE Regulations on organisations has had an impact on both policy and implementation of the Regulations at the UK and European levels. The outputs from the research have helped to inform UK policy-making, and supported significant European reviews of the legislation as well as contributing to improving professional practice through training and information.

Case M23: M23 submitted two impact case studies to REF2014. The first demonstrates how the application of the Generic Reusable Business Object Model has been used to deliver a national e-student system. Key impacts include providing an e-student CRM system accommodating 80% of the student population in Macedonia; savings of 237,014 student days with associated direct cost savings of 2.2million euros and administrative and academic savings of 1,058 days and savings

of 43,660 euros. The second case demonstrates how research into Object Orientated programming has resulted in a feature-rich e-commerce platform that has transformed the management and operations of a traditional sheet music company and its expanding business partner network. Impacts include the adoption of an efficient electronic enterprise and distribution model that provides global reach at significantly lower costs; creation of a new income stream for the company (£40k year 1, rising to £260k year 3 and growing) based upon digital distribution; mitigation of media piracy by being able to minimise the price differential as seen by the purchaser and recovery of \$1million from an illegal download site in Russia who are now an e-partner.

Case O24: This case study describes the impact of research on improving employment outcomes for disadvantaged groups by influencing Government policy on employability. The case study focuses on the contribution to national employment policy from research conducted by the O24's research centre. Impacts outlined in this case study describe research that has been applied in the public policy field to address the issue of improving employment outcomes for those with complex barriers to employment.

Case O24: The focus of the case is Social Network Analysis which allows patterns of relations between actors to be modelled and combined with actors' attributes. O24 has applied these methods across a wide range of fields, achieving impacts both in the UK and internationally to make improvements in areas of health, commerce and policy. Methods have been applied to improve: the well-being of women and substance abusers in Bangladesh; the performance of supply chains; to demonstrate the effectiveness of prisoner management in reducing recidivism; and, to assess the effectiveness of health promotion initiatives.

Case P26: An integrated decision-making framework developed by P26 for Eurocontrol, the European air traffic management organisation, was instrumental in reaching an agreement on the changes and technologies required to integrate Europe's air traffic management systems. This is as part of the European Commission's Single European Sky initiative, a multi-year redesign of the European air traffic network by 2020, to eventually handle 20 million flights with fuel savings of €6 billion per year. During the census period, the framework enabled key decisions

on traffic synchronisation to be implemented, which facilitated a substantial increase in air traffic control efficiency, and increased air space capacity by 20%. The benefits of the research to the client organisation was recognised by multiple nominations for INFORMS awards.

Case Q27: Q27 submitted two impact case studies to REF2014. The first involved commissioned research into career management and development and led to changes in HR practice and policy within West Mercia Constabulary which have had clear benefits for the organisation. Subsequently, one of the products of this research, a psychometric tool called the Career Competencies Indicator, was successfully developed for commercial purposes in conjunction with a private sector consulting company. A version of the Career Competencies Indicator aimed specifically at 18-24 year olds was launched in April 2013 bringing immediate commercial benefits to the company involved but also potential benefits for an age group that is currently suffering particularly high levels of unemployment. The second case involved primary research in one particular area of expertise, time management, which has generated two new psychometric constructs of 'Time Personality' and 'Temporal Intelligence'. These constructs have been applied in workshops to help employees understand their time personalities and make changes to improve their time management. More significantly, however, these constructs have been disseminated in major practitioner publications, which have led to the incorporation of the constructs into a leading provider of training and development services Time Management training courses. This course seeks to train delegates in skills which can be used to improve their time management and efficiency in the workplace.

Case R28: This case study focuses upon enterprise and enterprise education. It describes the impact of intellectual endeavours in this area, mainly surrounding the production of a framework to foster entrepreneurial behaviour, and the emergence of an enterprise support approach that continues to support entrepreneurs. Impact includes informing the approach taken by enterprise initiatives toward enterprise development, challenging existing practice on enterprise education; increased enterprise start-up rates and sustainability of start-ups through enhanced enterprise activity and initiatives, development of resources which took a new approach to enterprise education; and policy implications locally and regionally.

Case S30: S30's military manpower forecasting model was developed with the Royal Navy from 1997 to provide medium and long-term manpower projections. The Naval Manning Agency has used this model since 2000. Work by S30 and colleague in 2009 and 2010 employed this model to establish that a proposed housing scheme was unviable; led to revised inflation forecasts being used in the planning process; and contributed to the integration of the Regular Service and the Reserve. In a wider Armed Forces context, a tri-service manpower model was developed by the Defence Analytical Services Agency in conjunction with S30, to improve the analytical rigour of military manpower planning in the light of continuing defence budget cuts.

5.2 Within-case synthesis of tensions and responses

Table 5-1 presents a synthesis of tensions raised by interviewees either implicitly or explicitly, and the responses (strategic or defensive) elicited in each case. The following section provides a discussion of these in more detail.

Table 5-1 Within-case synthesis of tensions and responses

Tension	Low impact & output						High impact, low outputs						High impact & outputs						Low impact, high outputs												
	A 1	B 2	B 3	K 16	Q 27	R 28	F 5	I 12	J 13	J 14	J 15	M 23	S 30	G 6	G 7	G 8	H 9	G 10	H 11	H 29	C 4	L 17	L 18	L 19	L 20	L 21	L 22	O 24	O 25	P 26	
Neutrality – bias	-		-				+	+			-		-			+				-				-	-		+	-			
Impartiality – partiality											-																				
Ostensive – performative										-	-			-	-		±	-	-	-											-
Risk – uncertainty													-				-								+						+
Communalism – proprietary				-			-					-		-			-												-	+	
Universalism – localism				-	-	-	±	-	-	-	-	+	-	±	+	-		-	-	±	-			-	-	-		-	±	-	-
Disinterestedness – interestedness/ authoritarian																					-				-			-			
Originality- commissioned										-										-											
Organised scepticism – dogmatism/expert	+			-	-				-					+			-		-		+		+	+			+	+	+	-	
Disciplinarity – interdisciplinarity			±	+	-	+	+	+			+	±	+		+	±	±	+	-			+			-	+	-		+	±	
Convergent – divergent thinking						+										+			-	-			+								

Tension	Low impact & output						High impact, low outputs						High impact & outputs						Low impact, high outputs											
	A 1	B 2	B 3	K 16	Q 27	R 28	F 5	I 12	J 13	J 14	J 15	M 23	S 30	G 6	G 7	G 8	H 9	G 10	H 11	H 29	C 4	L 17	L 18	L 19	L 20	L 21	L 22	O 24	O 25	P 26
Individualism – collectivism			-				-	-			-					-		-		-					±	-	-	±		-
Breadth – narrowness					-		-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-						-	-
Craftwork-articulation work			-	-						-								-												
Competition – cooperation																-								-		+	-			
Team – community obligations																+		+												
Freedom – dirigisme	-	±	+	+		+	±	±		±	+					-	+	±	+		-	±		+	±	+			+	
Rigour – relevance						-	±		+						+			+	±	±				-	-		+	-		
Global – local			+						+									+												
Nation state – competition state				+		+		+		+								+							-	-			-	
Protective state – productive state			+			+		+		-				+											±		+		-	
Present – future temporal orientation			-	-		+	-	±		±	-	+			+					-					+		+	-	-	
Internal – external orientation		-	-	-	±	-	±	±	±		-	+	±		-	+	-	±	±	-	-	±	+	+	-	+	±	-	-	±
Centralisation-decentralisation		+							+				+	+			+	+	+				+			+				+
Control – flexibility			±		+		-	+		-				±		+	+	+	+	+			±		±	±				

Tension	Low impact & output						High impact, low outputs						High impact & outputs						Low impact, high outputs												
	A 1	B 2	B 3	K 16	Q 27	R 28	F 5	I 12	J 13	J 14	J 15	M 23	S 30	G 6	G 7	G 8	H 9	G 10	H 11	H 29	C 4	L 17	L 18	L 19	L 20	L 21	L 22	O 24	O 25	P 26	
Instrumentally rational–value rational action	-	+					+				+										+		+					+	+	+	
Performing tension	±				+				±			±	±	+			+				+			+			+	-	+	+	+
Collaboration – control								-		-					-								-	-							
Knowledge exploration – exploitation	+				±	±	+	+	+	±	-	±	-	+	+	±	+	-	±	±	-	±	±	±	±	±	±	±	±	±	±
Insider – outsider		+							±	+									+		±		+	+		+	+		+		
Cohesive – diverse relationships				-	-					-					+			+													
Nodal proximity – distance			-			-							+				-						-						+		

Key: Strategic responses (acceptance, confrontation, transcendence, arbitrage) denoted by +. Defensive responses (Splitting, projecting, repressing, regressing, reaction formation, ambivalence, avoiding risk, avoiding conflict, drive towards consistency, drive towards simplicity, contamination) denoted by -. Interviewees displaying both strategic and defensive responses denoted by ±.

5.2.1 Neutrality – bias

This tension was experienced by interviewees across a dimension assigned as habitus, or the “acquired system of generative schemes objectively adjusted to the particular conditions in which it is constituted” (Bourdieu, 1977, p.95). This assignment was based on the relevant social mechanisms described or implied by interviewees, which included qualitative and quantitative vocabularies of practice (as in “speaking the same language”), collective identities (expressed as “different communities”), field practices (research methodologies) and cognitive frames (positivism and social constructivism). Interestingly, it could not be conceptualised as a contradiction between two different societal logics, such as professional and market, as both positivism and social constructionism are academic traditions. Instead, it was accounted for as a conflict between two field-level logics each of which interpreted the professional logic in different ways, across legitimacy and authority dimensions (Figure 5-1). This is a significant finding in that, to my knowledge, it is the first characterisation of a tension arising from a single societal logic.

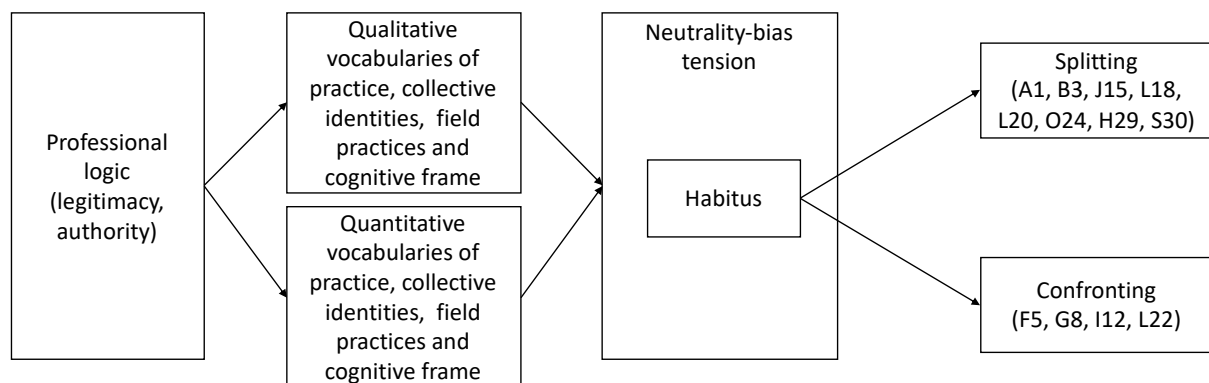


Figure 5-1 Neutrality-bias tension

By far the most common response of interviewees was splitting, essentially a reification of the division between qualitative and quantitative habitus:

“Academics are very poor at (interdisciplinarity). They talk their language and they do their thing... But they are crunching the numbers. People who take a quants methodology are not always amenable to seeing the qualitative data that could back it up. People do find it hard to talk to each other... Economist do things in a particular way. Quite often they are not looking at...where the data

comes from or definitional issues because they are trying to crunch the numbers, whereas sociologists are thinking about exactly those things. So quantitative economists who do econometrics do not talk well to people from other disciplines.” (A1)

However, a small number of interviewees confronted the tension through engaging in sensemaking as a form of boundary work (Gieryn, 1983), for the explicit purpose of generating impact:

“(Climate) scientists clearly have some idea of doing their research in a seeking truth way. The economists share that...So I don’t think there is a big clash there. I think the biggest clash comes about when you’re dealing with the decision analysts or the people who are much more comfortable with subjective views going into their research, subjective probability distributions... So in a way, that’s where the biggest clash has been, and it’s not necessarily been between those researchers, it’s sort of been between me, as someone steeped in decision analysis, subjective probability, trying to ask for information from these people and convince them, you know, I can use what they are viewing as a seeking after truth in a way that is useful for policymakers, even if they haven’t found the truth yet. But they tend to be quite uncomfortable with the idea of a subjective view, a subjective distribution, whereas that’s central to the work that I’m doing.” (G8)

5.2.2 Impartiality – partiality

This tension was only raised by one interviewee, and was done so in the context of their links to other academics. It is regarded as a contradiction between what is considered legitimate behaviour within professional and market logics (Figure 5-2). The mechanism of institutional reproduction was the normative expectation of impartiality, while that of institutional transformation was leverage (politically skilled actors mobilising support and acceptance) (Dorado, 2005). The interviewee responded with ambivalence, being uncomfortable with another’s behaviour though recognising that this behaviour increased their political influence:

“...(W)e were a voice at a time when government was concerned about binge drinking. But we were in a typical kind of situation. You know, you’ve got lobbying as well... and you’ve also got what I call these extreme positions... there was one person who did all the talking, one academic. And this academic goes to loads of stuff and does loads of stuff and is very anti the industry. But he does make connections with, you know, but it’s one kind of view.” (J15)

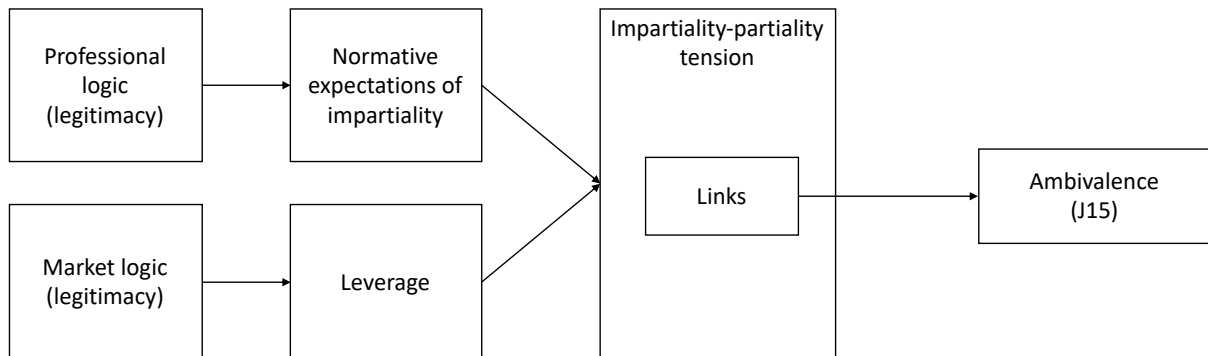


Figure 5-2 Impartiality-partiality tension

5.2.3 Ostensive – performative

This tension was experienced by interviewees during the drafting of impact case studies for submission to REF2014, as interviewees sought to fit their impact experience to the case study template. The template may be regarded as a material artefact representing both field and organisational practices of impact measurement. Embedded in these practices is the authority dimension of the professional logic, and specifically the propositions of sequential and temporal linearity and division of labour of the linear model of innovation. The difficulty arose for interviewees in crafting a narrative that organised the events and actions of their experience within the structure of the template, and attributed significance to their specific contribution, while at the same time ensuring the legitimacy of the narrative through truthful and evidential claims of impact causality. Thus, the conflicting logic is considered to be the legitimacy dimension of the professional logic.

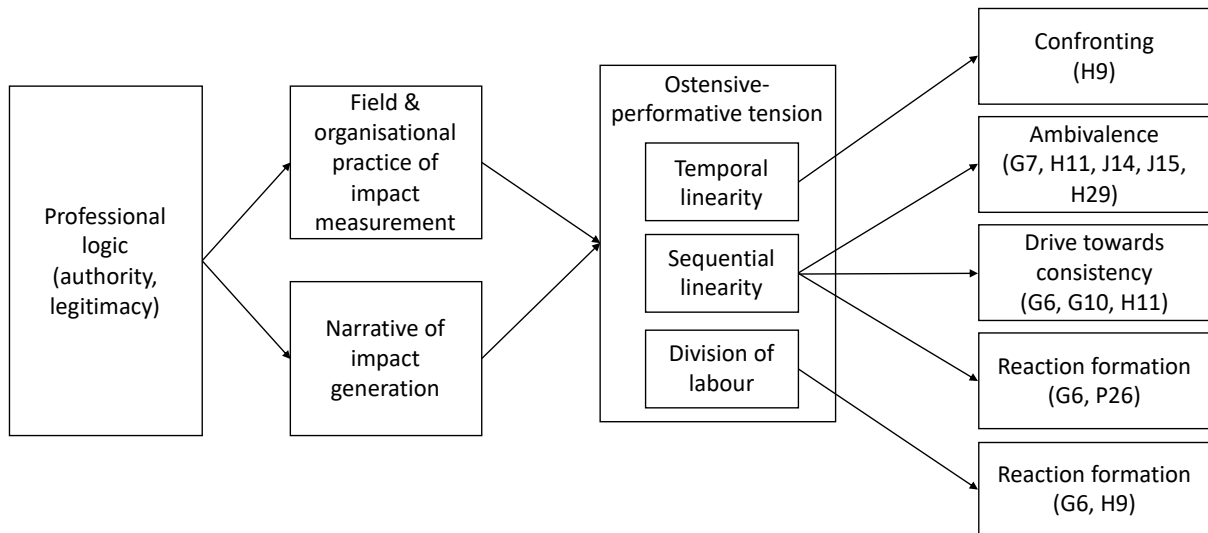


Figure 5-3 Ostensive-performative tension

The tension was experienced across the dimensions of sequential linearity, temporal linearity and division of labour (Figure 5-3). With regards to division of labour, interviewees responded through reaction formation, stressing the collective nature of impact, i.e. that it requires integration of the efforts and skills of multiple actors, including practitioners) rather than it being solely a process of knowledge transfer:

“(T)hats a core constraint I have in making these narratives in the way of ticking the boxes like they expect you to do because it doesn’t happen in a linear fashion, it’s a dialogue.” (G6)

A variety of responses were recorded with regards to the sequential linearity dimension of the tension. A minority of interviewees displayed reaction formation by stressing that their case study did not begin with a piece of academic research, but rather contractual research or even research carried out as a practitioner:

“(A)n impact case study is supposed to be about you do research, and then show that that research has impact. My case study was slightly different though. The project was about impact. It wasn’t about theoretical research that I’ve been doing and hey, I can show that actually, I have impact too... So writing it as ‘here are my fundamental research papers and here’s some proof that they’ve been applied’, I had to flip it around and say ‘No, no, this is specifically written for that.’” (P26)

More interviewees responded to the emphasis on sequential linearity with a drive towards consistency by “reverse engineering”, “honing down” or “retrofitting” a strategic and linear narrative. Often, a central university support function provided sub-editing assistance, in effect acting as a mechanism of institutional reproduction:

“It’s a bit reverse engineered in that when it came down to cases, they were looking for impact and then they established arguments back to the research. But, one could go back and look at what is the research we found and how did we do that? So when you’re planning for REF, you need to be flexible.” (G10).

Finally, some interviewees responded with ambivalence, attributing significance to their specific contribution, often reluctantly, while recognising the cumulative nature of impact and the simultaneous and parallel contributions other academic researchers may have made. This was prevalent in policy impact case studies, where policymakers draw from multiple sources of evidence in decision making, in a process to which the academic is generally not privy:

“I know certain well known London universities, people working there were getting letters from Tony Blair saying this had a big impact on (his) thinking right now and, and we can’t...if that’s what they want, it’s very difficult to get those things. No, they did give testimony, but the testimony is saying ‘We read this material and we use the database’. But that’s an input to their policy, it’s not a policy outcome. So they wouldn’t be able to say because of this, we did this. Because it wouldn’t be true. Because of this and ten other pieces, they might have done.” (J14)

Temporal linearity was addressed by only one interviewee, who responded through confronting the tension and engaging in a framing contest (Werner and Cornelissen, 2014) with HEFCE to challenge the latter’s assumption of linearity:

“HEFCE acknowledged last time around...that it doesn’t always happen in the right order, that you may get quantifiable change first after discussions with the faculty who are communicating their research, but they haven’t published it yet. And then you get the publications, so it is actually the research that has made the change but they want a link to publications. Very often it happens this way round.” (H9)

5.2.4 Risk – uncertainty

Experiences of this tension varied with the levels of scientific credibility accrued by interviewees in their careers and their attitudes both to Mode 2 research and to the critical function of academia. Interviewees stated that early career researchers (ECRs) were more risk adverse and tended to choose research topics in order to make Mode 1 contributions and gain credibility in their field. Indeed, ECRs were advised to avoid Mode 2 research as high quality academic contributions from such work were more uncertain and took longer to come to fruition:

“Firstly, if you're a new lecturer and you've just started your career, you absolutely must publish and it's your top priority to get stuff out into peer reviewed journals and thereby get yourself tenure. That's your top priority and you don't have so much time available for what is in a sense a riskier strategy of engaging with a firm, probably over a long period of time, interacting with people. You might not get to something into a high quality journal out of that. Or you might, but the risk is greater. And if you are at that stage of your career, it is less likely that people will take that risk.” (H9)

Mid- and late-career researchers with sufficient levels of scientific credibility responded to the tension through confronting, engaging in Mode 2 work more readily than ECRs (P26), and also adopting more critical perspectives (L20):

“Yes, first of all I enjoy (Mode 2) projects more than I do purely theoretical projects. But also, I think, as a more senior researcher I can afford to do so, because these types of projects are much harder to publish in top scientific journals. So as a junior researcher, I don't think you can afford to do that because you're sacrificing your publication track record and therefore potentially your career.” (P26)

“You know, my reputation is out there and if I...I can say things now that I wouldn't have dared say 10/15 years ago because I don't give a damn anymore. I mean, I do give a damn. I feel as if I can put my neck on the line a lot more than I could. And I recognise that others can't because they are early in their career.

I'm not a self-appointed Joan of Arc or anything like that, but when you said why do you keep going? There is that, well you could make a difference.” (L20)

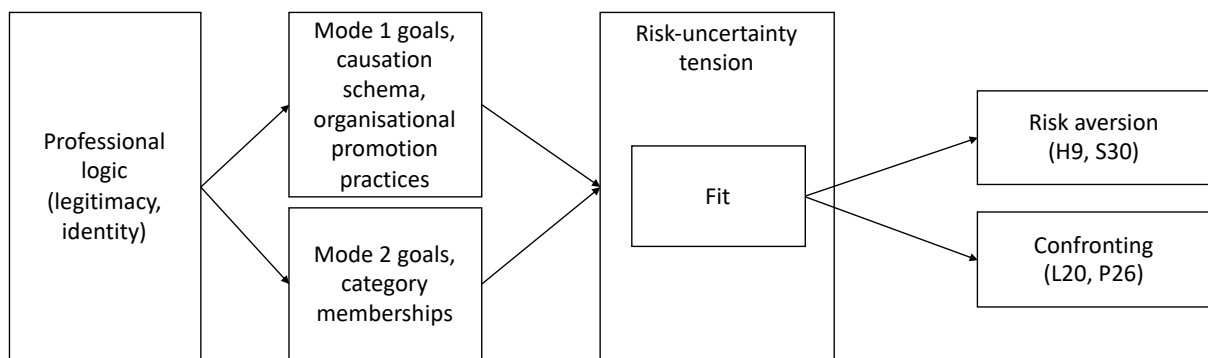


Figure 5-4 Risk-uncertainty tension

Again, this tension is conceptualised as a contradiction between two dimensions of a professional logic, legitimacy (based on academic reputation) and identity (Modes 1 and 2 category memberships which become more or less salient once sufficient academic credibility is accrued) (Figure 5-4). A single dimension of the tension, fit (extent to which an actors interests match a discipline’s rewards), is identified. Mechanisms of institutional reproduction raised by interviewees include Mode 1 goals (e.g. publishing in prestigious journals), causation schema (Mode 1 publications generate scientific credibility) and organisational practices (promotional criteria based on scientific credibility). Mechanisms of institutional transformation included Mode 2 goals (e.g. to “make a difference” by engaging in Mode 2 research) and category memberships.

5.2.5 Communalism – proprietary

This tension arose between what is considered legitimate under professional (timely knowledge dissemination for the purpose of reputation and status enhancement) and corporate (control of commercially sensitive intellectual property for the purpose of maintaining market position) logics. Mechanisms of institutional reproduction included the communalism norm and field-level practices of knowledge dissemination (publication through journals). Mechanisms of institutional transformation raised by interviewees included organisational intellectual property

management (IPR) practices, such as contracts and non-disclosure agreements, and obligation schema (refusal to publish even in the absence of contractual obligations).

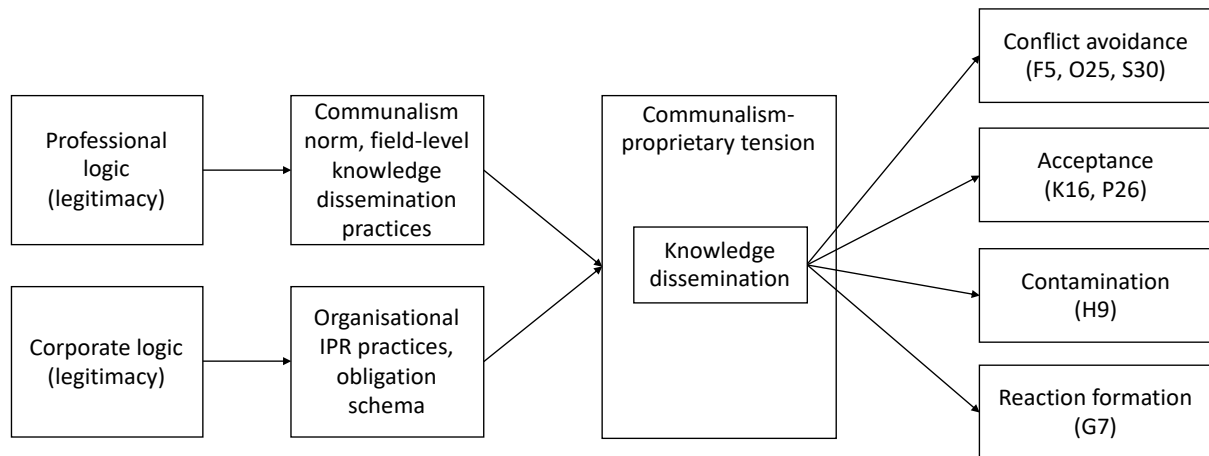


Figure 5-5 Communalism-proprietary tension

The most common response to this tension was conflict avoidance, as interviewees refrained from publishing commercially sensitive information:

“...(W)hen I worked in the United Arab Emirates in that conflict situation, I’ve never talked about that, that’s just never been disclosed. Some of the work I’ve done with NASA for instance, on noise and vibration, that’s never been disclosed and won’t be. In fact, I’ve had to sign confidentiality agreements for that. Work I’ve done for some of the manufacturers like JCB, I can’t disclose. I’ve got, I’m sitting on so much data and I’d love to publish it but the buggers won’t let me publish.” (F5)

Interestingly, in describing their own acceptance of the tension, one interviewee discussed how certain firms were adopting communalism for the purposes of being considered thought leaders within their sectors. In this case, the tension became performance-related (see Section 5.2.31), which was resolved through acceptance of both interviewee’s and firm’s requirements:

“The objective of the project was that we want to do academic research, which means publishing in top journals, but at the same time having an impact in this organisation. They had the same objectives. Of course they wanted to improve their organisation, but also publish and disseminate the findings. They were interested. And we see that more and more... I’ve recently started working with a

start-up company in Silicon Valley and those kind of companies now are interested in publishing their work and becoming known as a thought leader in the field. However, their target is very different. We'd target very high-end, scientific journals with a very narrow audience, they want a much broader audience, they want to go to conferences and things like that which doesn't help us very much. So there is a conflict there, where do we target those publications.” (P26)

Funding agencies are also adopting a commitment to communalism as a prerequisite for funding through open science. Here, one interviewee raised how academics were adopting a contaminated response, engaging with the corporate logic and compromising the communalism norm in order to protect their ability to appropriate scientific credibility from their data:

“(Academics) understand that the principle (of open access) is a good one. It's the tiny question of poaching data. So, very happy in the long term for people to read their work... But the release of data is the difficulty... I personally have seen nobody share a data set in that way, except when obliged to by their funder...I think the risks are still large enough to make people reluctant to move unless they must.” (H9)

Finally, one interviewee described a reaction formation response, refusing to work with practitioners seeking to limit dissemination (G7):

“The great thing about working with OFGEN was that...they encouraged publication and, you know, didn't care what I published at the time. Yeah so, they knew what the deal was and, you know, we were using their brand and they were using mine. But of course other people would try to approach it differently and have said 'Tell us what you are going to say first' and we of course refused to work with anybody who said that.” (G7)

5.2.6 Disinterestedness – interestedness/authoritarian

This tension was the consequence of contradiction in sources of identity under professional (association through technical proficiency, loyalty and prestige) and

market (science as a business) logics (Figure 5-6). A single dimension of the tension, fit, was identified and defined as the extent to which an actor's interests and identity matches normative expectations of disinterestedness. Mechanisms of institutional reproduction of the professional logic were symbolic (normative expectations of disinterestedness, goals related to research topic choice and category membership as a disinterested academic) and those of institutional transformation were structural (leverage).

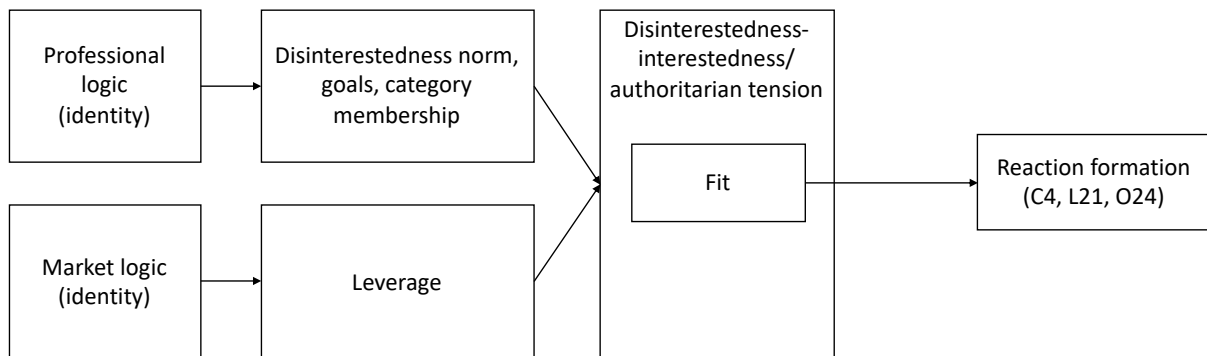


Figure 5-6 Disinterestedness-interestedness/authoritarian tension

The tension's sole response among a number of interviewees was reaction formation, as an expression of distaste regarding interestedness exhibited by the interviewee themselves (C4) or by other academic or practitioner researchers (O24):

"Now, the really worst case scenarios are consultants, and I would include one or two academics in this, under this title. They deliberately go around and try to rubbish their competitors...they are seen as very wise because they've seen these holes, but they don't have to actually provide a solution. And it also means that then they get the contract later and there are a couple of academics, let's say you know, run big things and never write an academic paper and some, one or two of them I would say, I keep my eye, not all of them by any means. But there are...one or two who actually act competitive, use this competitive way to critique." (O24)

"I always sort of maintain that my position on this is sort of morally neutral. I'm neither in favour of, nor against, high pay for executives...It's a sort of intellectual, an interesting intellectual inquiry. And I am interested in the truth rather than using my material. Now I happen to be of the view that the market, the labour market for senior executives, doesn't work particularly well. And pay, which is the price of

labour you know, this is not the outcome of an efficient market. Yes, I suspect executive pay is too high. But I'm not trying to...I don't have a cause.” (C4)

5.2.7 Organised scepticism – dogmatism/expert

This tension emerged in the context of knowledge translation, i.e. a two-way discourse between academic and audience intended to create shared meaning and address interpretive differences (van de Ven and Johnson, 2006, p.26), where academics were faced with situations in which non-academic audiences held incorrect frames concerning how and why a particular phenomenon worked. Two types of audiences were identified, practitioner stakeholders of research projects and central university administrators assisting academics in writing REF case studies. In all cases of the former, the interviewee confronted the tension by engaging in sensemaking, involving a rigorous analysis of evidence followed by sensegiving (Figure 5-7). This was done even where findings may have proved unpopular with the audience. However, interviewees found dealing with the latter audience more difficult, in particular where university administrators favoured quantitative over qualitative evidence. Here, the interviewee responded through contamination (i.e. acceptance of the corporate logic by expending further efforts to gather evidence, even to the extent of risking reputational damage with research collaborators).

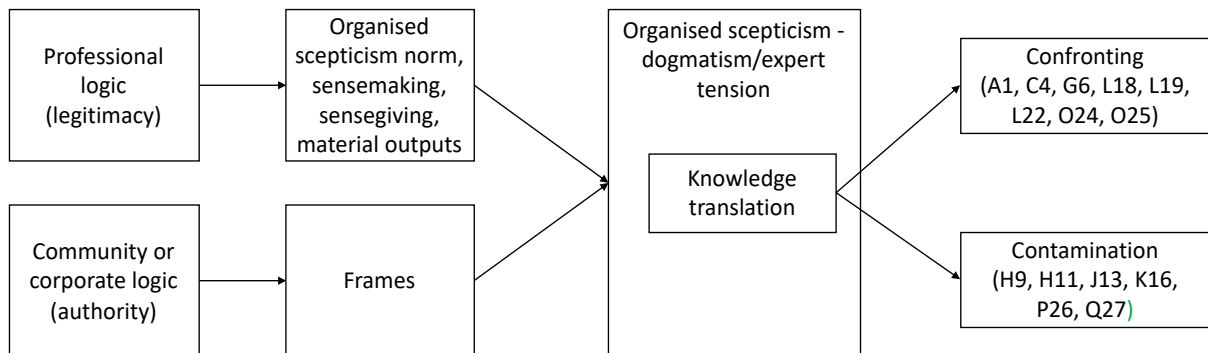


Figure 5-7 Organised scepticism-dogmatism/expert tension

Mechanisms of institutional reproduction included the organised scepticism norm, sensemaking, sensegiving social interactions as well as material research outputs, in which were embedded the legitimacy dimension of the professional logic (reputation and personal expertise). The other pole of this tension was associated with the

authority dimension of different logics, depending on the audience. For example, hierarchical position as a source of authority of the corporate logic was encountered when dealing with practitioner (O24) or university administrator audiences (H11). Commitment to community values & ideology as a source of authority of the community logic was encountered when dealing with societal-level beliefs (A1).

“We did a report on opening the labour market in Britain for a German think tank that wanted to use it for a debate there, which was ‘If we let all these (immigrants) in’. And there was one section I worked on very hard to get right, which is the impact on wages. Because I didn’t want to take a propaganda view of saying it doesn’t affect wages at all. Which it virtually doesn’t, but it does do in certain areas a little bit. So I wouldn’t say I was uncomfortable with that, but I thought it was important that I have an answer that has integrity and was accurate. Because the common thinking about it was ‘They come over here, our wages drop’. Which isn’t true, but there is some competition in some sectors. So I remember spending quite a lot of time writing that, just looking at what the evidence was.” (A1)

“It’s actually amazingly important to call people’s bluff... (W)e had a couple (of local authorities) sort of say ‘Well no, childcare is a women’s issue, that’s why we’ve got 100% women’. Then we turn around and say ‘Well, here’s the numbers, actually its 20% men, why have you got no men?’ Instantly, within three months, the number of men in every local authority started to go up. Now that had real impact...and that was by going through four years of a project where you’re feeding back, you’re discussing things, both qualitative and quantitative.” (O24)

“What was difficult, impossible really, was to produce the sort of evidence that was expected. So the REF impact team was saying ‘You must have... letters from ministers saying that this was a really great piece of work, and what we did with it was XY and Z...we developed a new bit of equipment.’ And it just doesn’t work like that, it’s a sort of a slow burn, a drip, drip, drip feed of work. So that was very difficult and probably not terribly successful, and I don’t think any of the other case studies in the business school, I don’t think they were deemed to be that credible by those who were evaluating them because you don’t have that kind of evidence really... At the launch, the Prime Minister said, there is a quote which was pretty good impact frankly. But that was deemed to be a bit too wishy-washy.” (H11)

5.2.8 Universalism-localism

This tension arose as a consequence of interaction between dimensions of identity under professional and community logics (association with Modes 1 or 2 communities respectively). Fit, defined as the extent to which an individual's abilities match community requirements and an individual's interests match community rewards, was identified as the sole dimension of this tension. Mechanisms of reproduction of the professional logic included Mode 1 category membership, vocabularies of practice and goals, as well as HEI recruitment practices and field-level regulatory practices (e.g. REF) which privilege high quality, Mode 1 academic outputs. Mechanisms of transformation to the community logic included Mode 2 category membership and goals, and decision making and reward practices within circuits of knowledge.

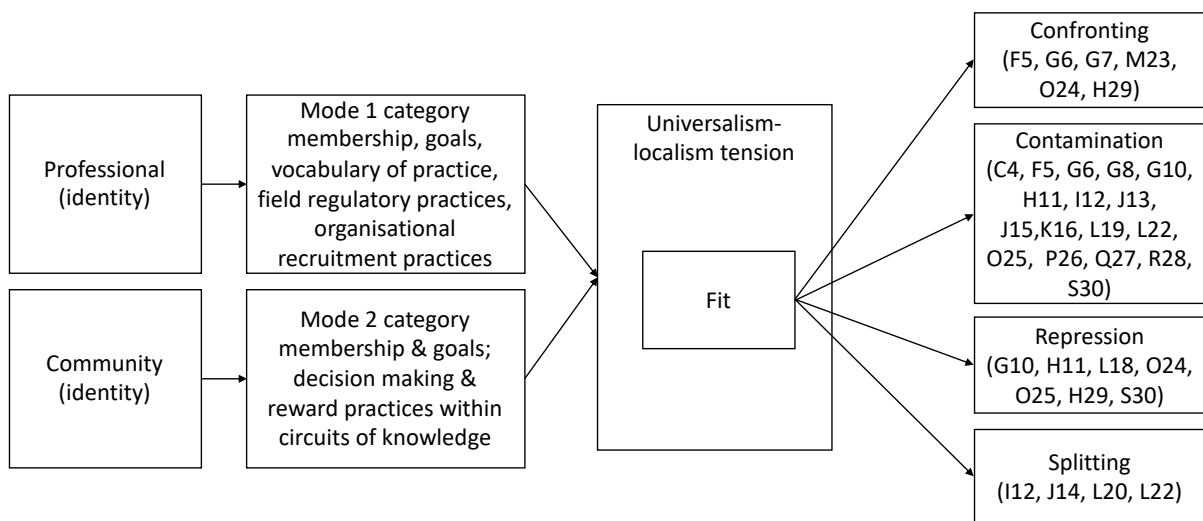


Figure 5-8 Universalism-localism tension

The predominant strategic response to this tension was confronting (conducting research followed by further knowledge translation activities to derive impact):

“OK we've got to have academic rigour and scientific validation if you are writing a research paper, but at some juncture you've got to then take that research and apply it in a practical setting. People within industry have to see the value of that work. That's something I've always condoned, I mean it works particularly well for, particularly for impact.” (F5)

However, defensive responses were more common than strategic, with the predominant one being contamination (undertaking research congruent with a practitioners' agenda regardless of whether academic outputs will be created):

“... (I)t’s literally saying we’re going to write a working paper for the industrial relations research unit which is based here and if we publish at some point down the line, fine, but if we don’t then we don’t really care because, you know, ultimately if you’ve got a piece of research which is cited by a government minister in Hansard, you don’t really care what happens in a journal, probably...But I hasten to add, what we actually cared about was facility time, we didn’t care about the universities research. We didn’t say ‘Oh we can focus this and generate impact for the university.’ We did it because we actually thought it was an important issue.” (L22)

The next most common defensive response was repression, which was typically observed by interviewees in other academics who chose to pursue goals of academic contributions rather than impact, influenced by HEI recruitment practices, divergent vocabularies of practice and the research agendas of Mode 1 communities (S30). Occasionally, an interviewee engaged in repression, driven for example by the output quality threshold of the REF (O24):

“I think people who have got a very... a certain sense of what it is to be an academic and how they see their role will sometimes look at impact and go ‘Oh God, you know, I didn’t come into research for this ... no, just no. “ (S30)

“I used to do a lot of what we call consultancy or whatever, which did have an impact...And a lot of that has been knocked out because it is so much, the REF is, you know you need 3 or 4 stars to get it in...(T)he big problem is people who often do those papers are also the ones who might actually do a lot of applied stuff. And you’ve got an opportunity cost there and people will say ‘Well my career is basically the 3 or 4 star, not impact. You know the bottom line is I’m going for another job, so long as I can show I got one or two grants, I can tick that box but its papers they’ll be going for.’ (O24)

The fact that certain peers did not engage in impact activities was usually responded to by splitting, recognising the validity of this course of action within a broad academic collective identity:

“I’ve got a great mate at Birmingham now for years, and he just, you know he writes 4 star papers for fun. He’s got about 6 already you know. And he’s got no interest in impact, he just does his job, does his stuff and gets on with it. And so those kinds of guys, I’ve got no problem with them not being interested in impact. No problem at all.” (I12)

5.2.9 Originality – commissioned

This tension was raised by just three interviewees. It emerged in the context of knowledge creation as academics commented on the effect of the expectation for impact on research directionality (Weber and Rohracher, 2012). It is regarded as being the consequence of a contradiction between sources of authority under professional (professional association) and market (accountability to funders) logics. Mechanisms of reproduction of the professional logic were category membership and field-level decision-making practices of Mode 1 communities, and causation schema concerning the negative effect of impact on research directionality, while those of transformation to the market logic were obligation schema concerning Mode 2 community demands and category membership.

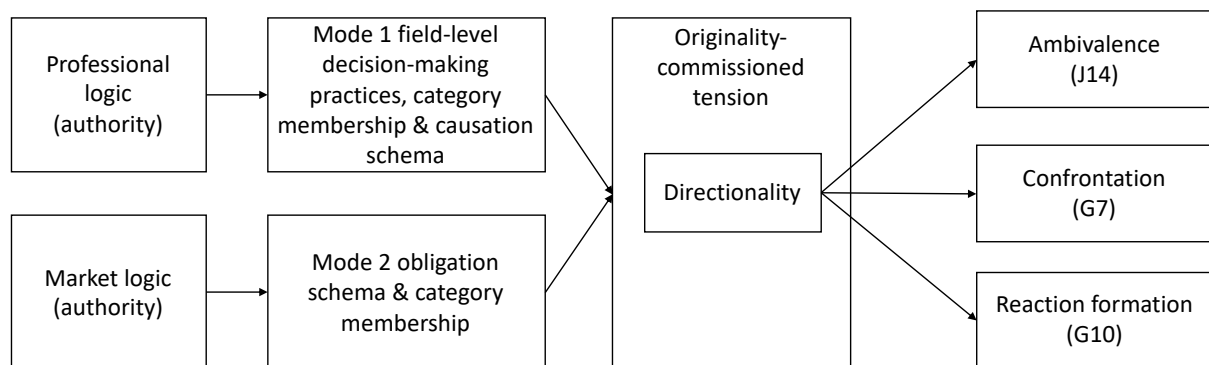


Figure 5-9 Originality-commissioned tension

Each interviewee who raised this tension responded differently, depending on their most salient category membership. J14 reacted with ambivalence, recognising the

importance of impact but noting its detrimental effect on directionality, while G10 reacted with reaction formation, criticising Mode 1 directionality decision-making practices. G7 confronted the tension by identifying an original contribution within a commissioned piece of work.

“In order to generate impact. It can have an impact on the way we do our research and how we disseminate this. There's a danger that by only...By going to this impact agenda where we're not researching things we should be researching so that, so it does have an impact on the research we do to a certain extent yeah.” (J14)

“I don't find much when I look at papers...say the proliferation of strategy frameworks which academics think is all over. That's not helping industry. They are confused by this. And where is the scientific research done to consolidate this knowledge? The way you get ahead in academia is to come up with a new shiny thing. Within physics that counts because a new shiny thing can change the world. New shiny things in management are just likely to cause more dismay and confusion. I think it's pretty appalling state actually. The lack of self-awareness of the community just adds to the appallingness.” (G10)

5.2.10 Disciplinary – interdisciplinary

This tension arose across a dimension of fit, defined in this context as the extent to which an actor's interests match disciplinary or regulatory rewards. These reward systems were treated separately as the former was described in terms of category memberships and research goals and the latter in terms of the legitimacy of changing regulatory environments, reinforcing Hoffman's (2011) distinction between top-down initiatives encouraging interdisciplinarity and bottom-up epistemological beliefs among researchers in “bridging disciplinary bailiwicks”. In consequence, this tension is conceptualised as emerging due to a contradiction or convergence between three logics (Figure 5-10). The bottom-up component involves separate field logics which derive from a common professional logic but differ along dimensions of identity, legitimacy and/or authority. The top-down component involves either of these professional field logics with what may be either a corporate

logic under which interdisciplinarity is legitimised as being essential for greater innovation, or a community logic which legitimises interdisciplinarity for the purposes of solving wicked problems on behalf of humanity (Klein, 2015).

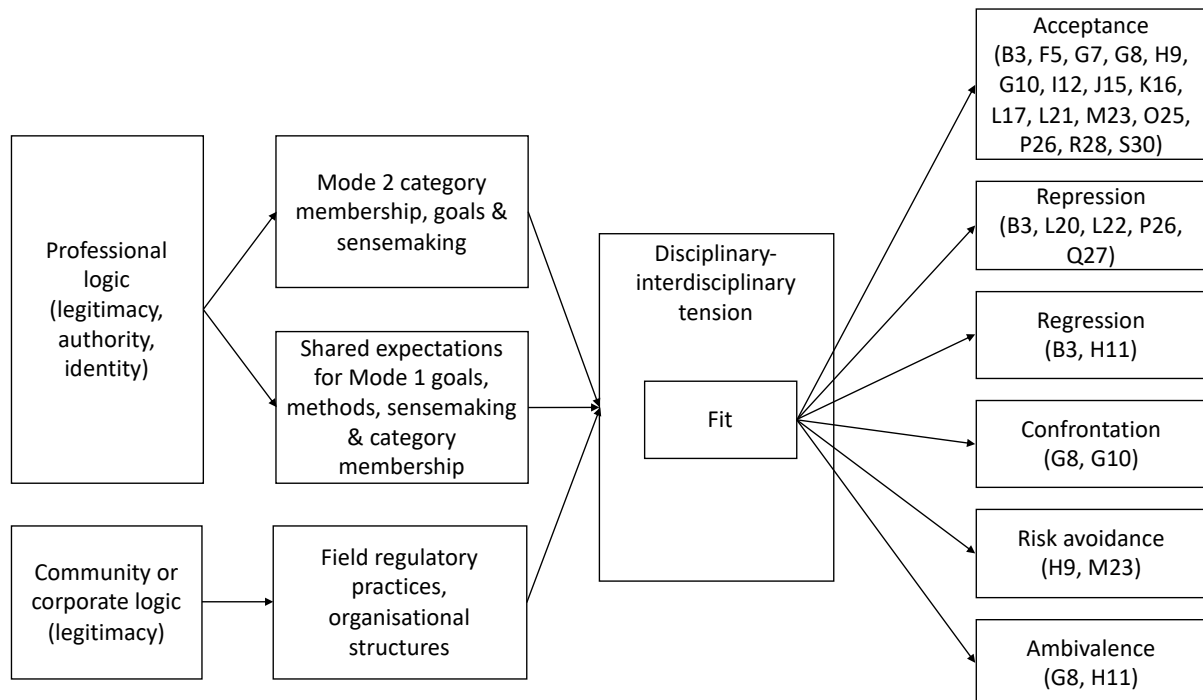


Figure 5-10 Disciplinary-interdisciplinary tension

From a bottom-up perspective, descriptions of the tension suggested that interviewees drew on separate disciplinary Mode 1 and transdisciplinary Mode 2 category memberships when faced with potentially cross-disciplinary research projects. Other mechanisms of institutional reproduction included shared expectations for Mode 1 research methods, research goals and sensemaking, while those of institutional transformation included Mode 2 research goals and sensemaking, and both field regulatory practices and organisational structures which emphasise interdisciplinarity. Many interviewees who discussed this dimension of the tension displayed acceptance at a personal level:

“(Because of REF) I feel more comfortable doing cross disciplinary stuff. Much, much, much more comfortable. So I’m not seen as a bit of a, you know, ‘Why are you doing that? Why are you working as a separatist? Why might you be interested in working with the National Theatre or cultural organisations?’ So in that sense, it feels as if you breathe more easily because that’s there.” (S30)

In discussing attitudes of potential collaborators or of their disciplinary or organisational communities to interdisciplinarity, more defensive responses were noted, including ambivalence (accepting legitimacy of interdisciplinarity measurement in principle but questioning the practice) (H11) and regression (retrenchment to disciplinary boundaries) (B3). Regression, though a defensive response, was generative of impact as it facilitated impactful research collaboration between academics with similar goals (P26):

“Whether the drive towards trying to make it interdisciplinary, in the sense of representation multidisciplinary, ‘We’ve got to have a geographer on board because off etc.’ as opposed to asking questions that are multidisciplinary, I don’t think that’s yet in place. Most of it is about ‘Let’s recycle the sorts of social and environmental problems that we’ve been having so far’...I suspect there is an element of still continuing to ask the same questions but saying we’ve got to do this in a multidisciplinary way, rather than actually how do we reformulate the questions to reflect the complexity of the question.” (B3)

“Therefore I think (interdisciplinarity measurement as part of REF is) a good thing to do, but I also think they need to think carefully about what they mean, that they don’t just mean somebody from one discipline and somebody from another discipline on the same research project.” (G8)

“The (collaborators) were all business school people. In fact, that project, all from the same research group. And yes also with the Heathrow project, despite it being a big project, it involved people from the same research group, students and a mix of PhD and MBA students. Quite narrow in terms of disciplines. (We didn’t experience interdisciplinary difficulties) because we’re all targeting, for instance, the same journals.” (P26)

In confronting these defensive responses, two interviewees stressing the need for an integrator to stop retrenchment to disciplinary boundaries:

“I think that if you just put a small team together of some economists and some scientists, it’s not likely to be that fruitful because their whole world views are likely to be different...So I think it’s like keeping oil and water mixed, you just need to

keep stirring all the time, otherwise people will actually go into their own disciplinary backgrounds.” (G8)

From the top down perspective, the legitimacy of the increased emphasis on interdisciplinarity which REF introduces was met with a wider variety of responses, including repression (L22), ambivalence and risk avoidance (H9), as well as acceptance. Here, the transformational mechanisms included field and organisational level regulatory practices and policy while reproductive mechanisms included causation schema concerning how interdisciplinarity would be assessed.

“I have to admit it just bores me a little bit to be honest. No, seriously it does because, I mean, ultimately interesting research is interesting research. I don’t know why you need to bring together a whole range of different disciplinary backgrounds, which if anything can just muddy the waters, to produce something which is valuable. I can’t see why that type of research would be preferenced over anything else to be honest.” (L22)

“We did not submit REF case studies that cross departments...So being able to do that more successfully in future would be good. My understanding is that we are planning institutional case studies. That’s the kind of thing where we could say cross disciplinary collaboration. And it’s a good thing, it’s tremendously helpful because we couldn’t categorise that work successfully last time. So very supportive of that... And we were a little bit concerned when we selected that case that the panel would look at it and go ‘Urgh, that’s outside of my remit, how do I judge this?’ So this was difficult, and it guided the selection of the things we put in. Which was a shame.” (H9)

5.2.11 Convergent – divergent thinking

This tension arose across a dimension of fit, defined as the extent to which an actor’s definition of science matches that of their research community. Interviewees responded to the tension in one of two ways, which are conceptualised here as involving two separate logics contradictions (Figure 5-12).

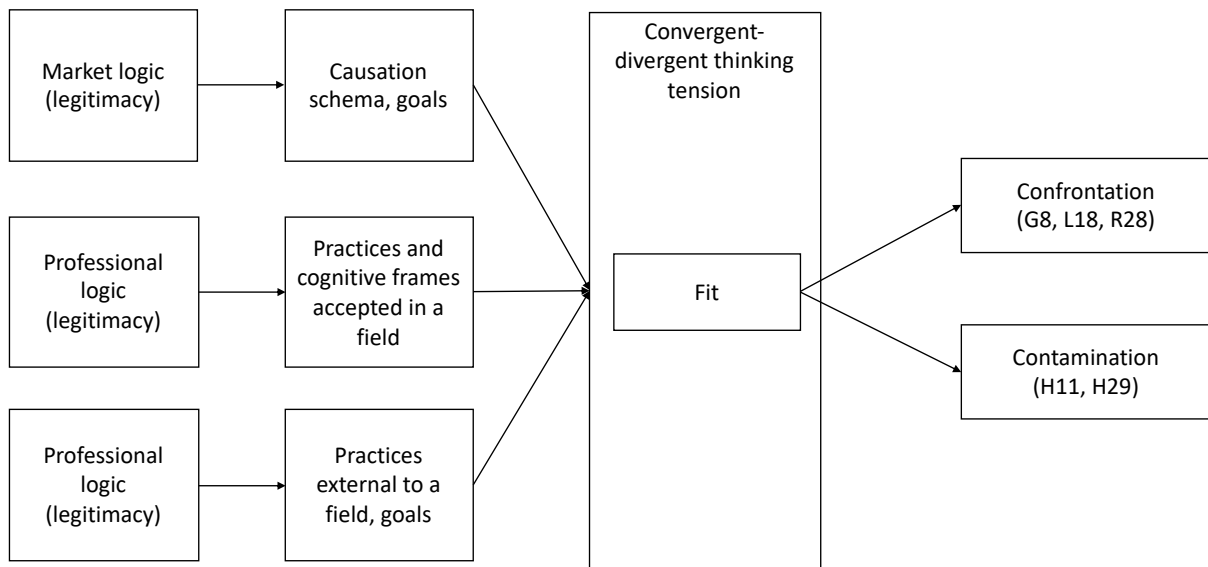


Figure 5-11 Convergent-divergent thinking tension

The first response was contamination, where the interviewee viewed their field as undertaking research which was not sufficiently fruitful, and consequently adopted a market logic by shifting their focus to knowledge translation and impact activities:

“I mean in the social sciences, I’ve been around, I did my PhD in the early 80s, and I’ve seen a lot of changes in that time. My view is the big meaty questions, the basic research, have already been tackled. Nowadays there isn’t a lot to tackle in the social sciences where you’re doing fundamental research. So really it’s all about making impact and translating research into practice.” (H11)

The second response involved confrontation which involved challenging the dominant definition of science within their field through adoption of new research methodologies, which over time became accepted within their field. This was conceptualised as a contradiction in legitimacy between two field logics descending from a common professional logic, one determining the definition of science dominant within an academic field and the other transformative, underpinning alternative definitions of science:

“...(B)asically people thought that I was crazy. It was so uncertain that you could not possibly do a quantitative model of what might happen with climate change and impacts and possibly do something about it. And it was because I had the background in decision analysis that deals with uncertainty and is the core of what you do that I thought I had a bit of a competitive advantage here, that I could do

something in this area probably nobody else could do. So even though, you know, a lot of people externally were thinking this wasn't worth doing, I got a lot of support internally here to do it and I got the funding from the EU and I thought it was probably worth having a go at. The same applied in 1995, the second version of the model, there wasn't many people doing this,...and even in 2002, people weren't totally sold on the idea. A complete flip happened in 2006 when there was a report called the Stern Report on the economics of climate change. They used this model, okay?... So, suddenly everybody was really interested in this work."

(G8)

Within this conceptualisation, the professional logic is regarded as being dominant within research fields, in conflict with both market and the transformative professional logics. Mechanisms of institutional reproduction raised by interviewees included field-level practices (research methods accepted within the research field) and cognitive frames, while those of transformation include field-level practices (research methods external to the research field), causation schema concerning the fruitfulness of a field and personal goals for attainment of various forms of scientific credibility.

5.2.12 Individualism – collectivism

This tension was instantiated along a dimension of fit (the extent to which an actor's interests matches a field's rewards) and sacrifice (the totality of losses which actors would incur by not contributing to their fields). It arises where field-level practices concerning the definition of science of a scientific community (including both cognitive frame and research practices) conflict with an actor's goals towards institutional entrepreneurship, category membership of a circuit of knowledge (networks linking state agencies, corporations and universities in entrepreneurial research endeavors) (Slaughter and Cantwell, 2012), and causation schema related to costs and benefits of community membership.

With respect to fit, a number of interviewees reported that the Mode 2 nature of their work did not "fit the mold" of the "narrow" scope of Mode 1 journals in their fields. Most responded by projection of the tension onto the field, arguing that journal

reviewers did not understand their paper, that a journal lacked real-world relevance, that an “obsession” with CABS listing was at fault, that the system of academic publishing was broken or that a journal’s scope deterred peripheral work:

“And in terms of tensions for myself, there were tensions and they’ve tended to be that it’s almost impossible to get the work I do published in the very theoretical disciplinary journals which tends to be the ones which get high rating when you’re looking at a research evaluation.” (G8)

Early career researchers were reported to respond through repressing the tension and adhering to field-level practices:

“(M)ost of my other colleagues don’t seem that interested (in impact). Slowly over time, they are aspiring to academic careers and not that interested...When I was here about 20 years ago, it was about a fifth of the size and every single person came from industry. And as it’s grown, you got a lot of people come through with an academic career in mind who have never worked in industry, and do just what they think they need to do to get ahead in their career choices.” (G10)

Three interviewees described a combined strategies response to the tension through compartmentalisation (Bullinger, Kieser and Schiller-Merkens, 2015), publishing in both Modes 1 and 2 journals, or choosing alternative dissemination channels, to reach different audiences:

“You are writing for different audiences. So when I write an academic paper now I don’t really, unless I’m writing for Future Local Economy or something like that, I really don’t expect the academics, or the non-academics, to pick it up. If I want them to pick it up I have to do another method...actually more recently blogs, I find, are quite interesting.” (O24)

Two interviewees responded through reaction formation, refusing to publish further in academic journals but seeking alternative ways of knowledge dissemination generative of impact:

“So my ambition for 2021 is to have a really strong impact case study. (My paper) was killed off by the academic system. That’s my plan. (Publishing) is too slow. I’ve now started a website to deliver these templates for free to the

world so I can push impact. The web design tools are fantastic, why would I do anything other than write immediately to the world on web articles?” (G10)

With respect to sacrifice, interviewees weighed the cost of not publishing in a field journal versus the benefit of attaining the scientific credibility of publication. Most responded with ambivalence, recognising the “trade-off” which enabled them to pursue research activities more congruent with circuit of knowledge category membership while not attaining status within a field:

“And I guess (not publishing in Mode 1 journals) may well have counted a bit against me in the fact that I’m going to end my career here as a reader rather than as a professor. You know, I have a visiting chair at (another university), but that is not quite the same thing... I’ve put it rather negatively, but I would also put it positively in the sense that I have this enormous freedom to do what I wanted the whole of my career. I’ve done the research that I wanted, and it’s been a delight to do it. And if it means, you know, if I’d been much more narrowly focused I could have got the chair, I’m very happy with the trade-off that I chose.” (G8)

One interviewee, an ex-practitioner who subsequently became an academic, displayed reaction formation, a complete aversion to publishing within Mode 1 journals:

“But I was never interested in career...I’ve got colleagues around me now and I’ve had a number of arguments over the years, but I’ve never felt comfortable with doing publications which I think are just for your own career. Having published in 3 and 4 journals...all it really does is have impact on your own career. So you do really well but then they’re not really read by anyone, other than academics and that wasn’t ever really what motivated me to do what I was doing.” (I12)

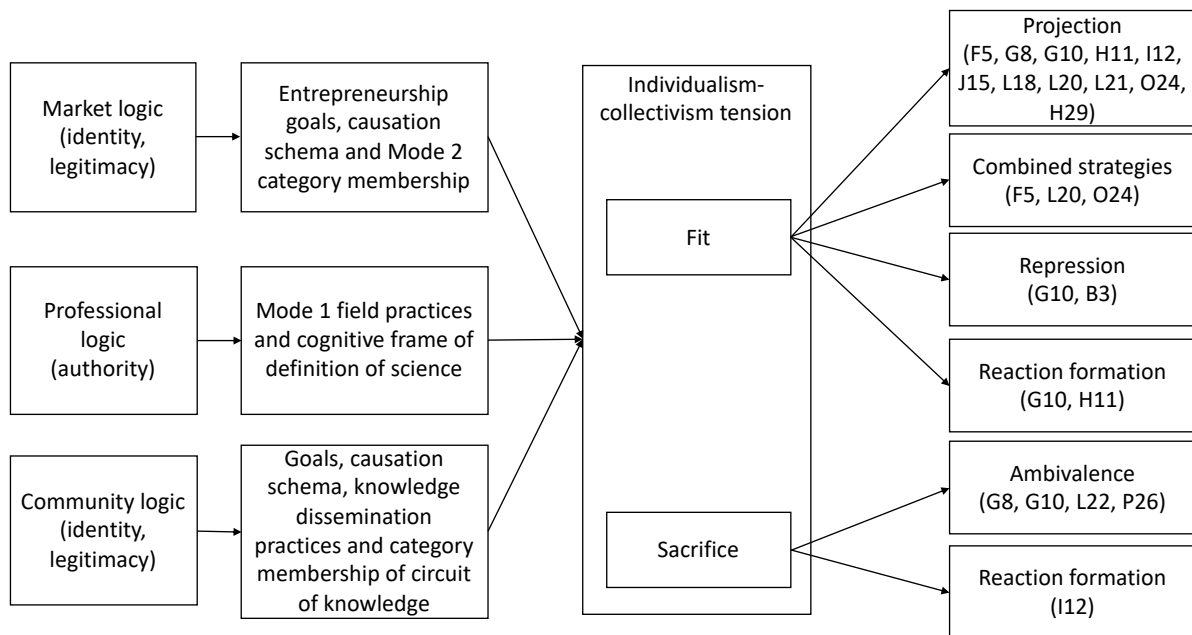


Figure 5-12 Individualism-collectivism tension

These findings suggest two distinct logics contradictions are in operation. The fit-related tension appears to arise through a well-known professional/market logics interaction, with authority of the former based on professional association conflicting with identity (science as a business) and legitimacy (successful innovation) of the latter. However, the sacrifice-related tension appears to be associated with a community rather than a market logic, as the academics involved appeared not to be motivated by knowledge commercialisation but by an intrinsic desire to work on problems associated with specific circuits of knowledge. Sources of authority (commitment to community values & ideology) and identity (ego-satisfaction & reputation) of the community tension contradict the academic logic's source of authority. This supports Lam's (2011) finding of an intrinsic puzzle-solving motivation among certain academic entrepreneurs, but is significant in suggesting a professional/community conflict as an alternative and supplement to the professional/market logics conflict usually associated with the individual/collective tension (Figure 5-12).

5.2.13 Breadth – narrowness

This tension was instantiated along one dimension, fit, of both occupational and organisational embeddedness, in terms of conflicts between an actor’s category membership of a research community and relational role as a faculty member. It is therefore considered to emerge due to contradictions between notions of identity informed by a professional logic (association with an academic community) and what is considered legitimate under a corporate logic (market position of the HEI).

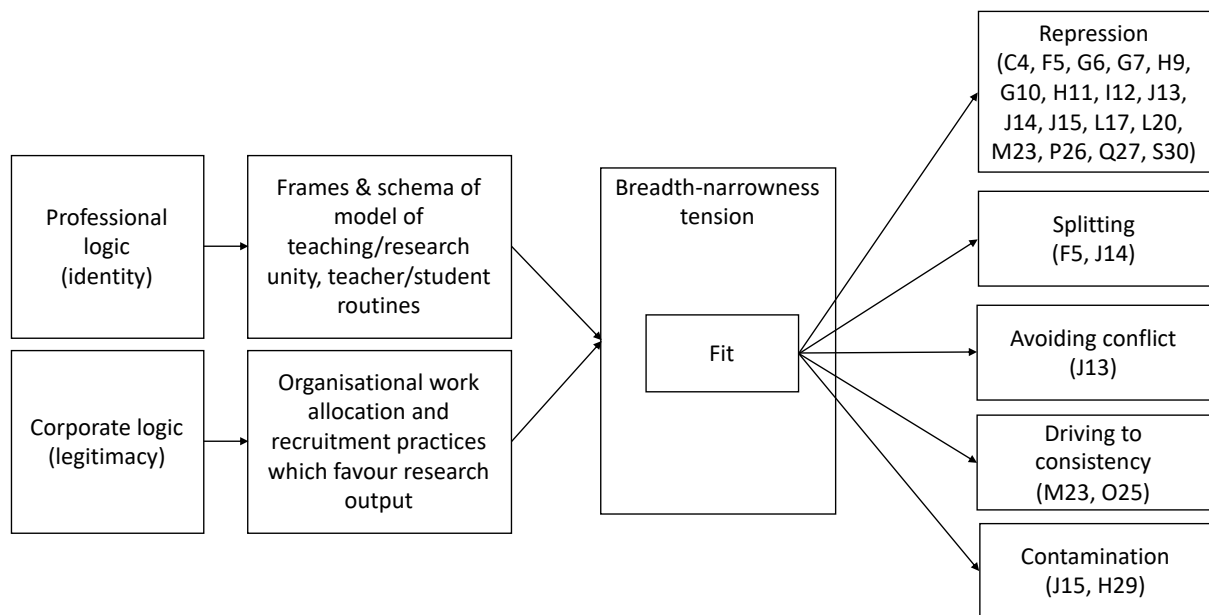


Figure 5-13 Breadth-narrowness tension

The tension was raised by interviewees only in the context of teaching and research or impact. Mechanisms of institutional reproduction of the professional logic were mainly symbolic, including frames and schema implicitly invoking von Humboldt’s model of unity between research and teaching (Henningesen, Schlaeger and Tenorth, 2013), though certain relational mechanisms (routines of patterned teacher/student interactions, mainly case study teaching) were also described. Mechanisms of institutional transformation towards the corporate logic were largely structural (organisational work allocation and recruitment practices which favour research output) and emphasised a neoliberal model of relative standing within a competitive academic marketplace and a separation of teaching and research (Delanty, 1998).

The majority of responses to this tension were categorised as defensive, predominantly repression of the corporate logic in favour of research/impact-informed teaching:

“(R)esearch informed teaching is...and I think again for us that was just almost a natural process if you're doing research. So for us, if you look at the underpinning research for both those (impact) case studies was object technology. Object oriented systems. So we developed a specialist masters course in that area. We initiated an international conference series in that area. So our research has always, our teaching has, not every aspect of our teaching but there has been research-informed teaching... quite often as a case study, it's quite often as guest lecturer, a problem from partners from industry.” (M23)

Other interviewees reported responses including splitting (separating teaching and research contracts), driving to consistency (making only sporadic updates of teaching syllabus) or avoiding conflict (by making trade-offs between teaching and impact demands):

“Here again, that is the balance we have to maintain...everybody supports industrial engagement, but teaching has become quite an important item of work load. On a number of occasions, we have to make trade-offs between spending time to develop the industry links and... okay the teaching, but we need to put in time and energy to make the students, to give them a good experience, and that would take of lot of time and energy as well. That is the major problem I have come across.” (J13)

Only occasionally did an interviewee discuss instances of contamination (Perkmann, Salter and Tartari, 2011), a compromise of the professional logic and an acquiescence to the corporate logic:

“These (academic stars)...what are they actually contributing to the school that they are going to? Very often they move on from that. I have advocated in this place that if we get these stars, there has to be some type of commitment regarding what they do for the school, not just... what's in it for them. Yeah but also, okay we don't employ them unless there's something in it for us, but I think that can be quite destructive as well, both for other colleagues that have been

working their butts off and then they see... and they know that they're getting different salaries. But also for the students. I mean if these people aren't going to come in and really engage with the students and spread their knowledge. And I really do feel that that divide going forward, the divide between teaching and research is one of the things that I would like to improve I think.” (J15)

5.2.14 Craftwork – articulation work

This tension emerged as a contradiction of notions of identity informed by professional (association with an academic community) and corporate logics (bureaucratic roles). A single dimension of the tension was noted, identified as fit or the extent to which an individual’s abilities and interests match project leadership requirements. Mechanisms of institutional reproduction include category membership as an academic researcher and frames of academic autonomy, while those of institutional transformation include role identity as a research leader, directive practices and obligation schema concerning stakeholder expectations of schedule adherence.

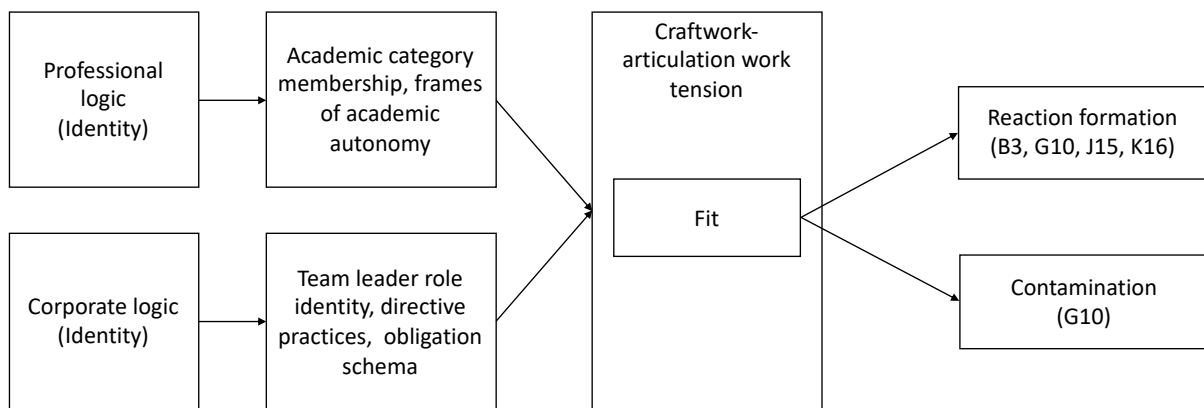


Figure 5-14 Craftwork – articulation work tension

Two responses were observed, both defensive. Reaction formation involved expressions of distaste for articulation work associated with a project, such as directing other researchers or administrative work associated with funding (B3). Contamination involved directing research colleagues against the tenets of individual academic autonomy (G10).

“I looked at it and I thought should I go for this associate professorship. But then it said, basically you have to pay your own income through research income. I spent 15 years in private consulting and the Institute is not set up for contract research. It would just kill me trying to do all the invoicing and stuff like that.” (B3)

“My academic colleagues are a bit frustrating sometimes in their ability to do the most simple things like a one-page summary by a date, they struggle. It’s a bit like herding kittens. In the first couple of years, I had to be on their case because you have to deliver a professional service. Temporal flaky behaviour is not acceptable. As its moved forward I could relax a little bit because I think people have found the value now it is a little bit clearer.” (G10)

5.2.15 Competition – cooperation

Just one dimension of this tension was raised by interviewees, that of links between the interviewee and academics from other departments or HEIs, where conflicts arose concerning how collaborative research projects should be run and scientific credibility distributed. From the interviewee’s perspective, the dominant logic was the professional, with association through technical proficiency, loyalty and prestige as the source of identity. Credit allocation practices served as the mechanism of institutional reproduction. The competing logic was corporate, where market position, i.e. a collaborator’s status within the field, acted as the source of legitimacy. Resource competition between research partners served as the mechanism of institutional transformation. The two logics encountered each other during structural overlap, where the roles of focal academic and collaborator came into association (Figure 5-15).

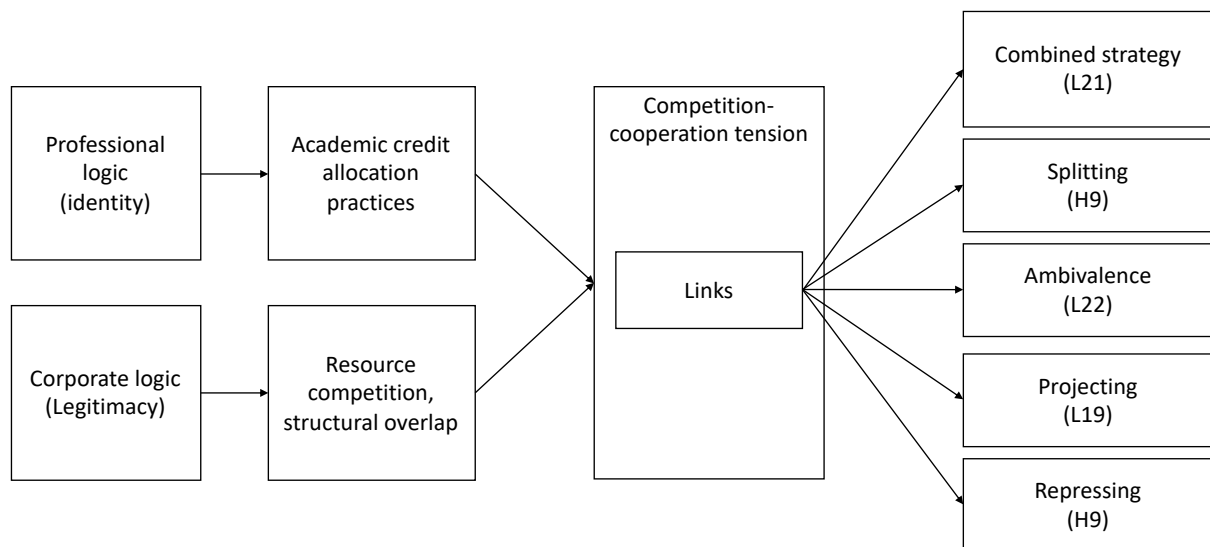


Figure 5-15 Competition-cooperation tension

Only one interviewee (L21) exhibited a strategic response to this tension, in the form of a combined strategy comprising splitting (dividing a project into discrete workstreams to separate conflicting researchers) and confronting (discussing the conflict to create a more accommodating understanding of issues). In all other cases, interviewees displayed a variety of defensive responses, including splitting (not collaborating beyond a “core group” of researchers), projecting (ascribing difficulties in collaboration to a senior manager in the collaborating school), repressing (competing with other institutions in recruitment of staff and students) and ambivalence (L22, below).

“(W)hen I was involved in a big ESRC research programme, I was one of the associate directors, it was, probably about 50 or 60 projects, and in 6 or 7 of those you know there were really fraught relationships between the teams... people who were used to being the principle sort of investigator, suddenly you put 4 or 5 PIs together and they could fight like cats in a bag...(I)n one case we actually split the project into two and in other cases it was a question of just trying to hold them together. You know talking to them independently and so on. There would normally come a time when people would actually realise, well actually, you either hang together or you hang separately.” (L21)

“One other tension you get is between institutions and I’ve actually been conscious of this recently because I’ve really been sort of a bit worried that my (collaborators) think that I might be hijacking the disability case. And the reason

for that is because I've got some money to chuck in to pay for the person at Disability Rights UK...But there is this sense and you get this when you talk to people in the impacts office, the admin people who say 'Well okay, this is a collaborative case between three institutions, what's (our) distinctive contribution?' And that becomes a problem, you end up thinking 'Oh Christ yeah, I'm actually collaborating and in competition at the same time with the people I'm working on this case with'... you just worry." (L22)

5.2.16 Team obligations – community obligations

Just two interviewees discussed obligations to team and community, both associated with a dimension of links to other actors in the context of succession planning. In both instances, the response was acceptance, as succession planning was seen as a means both to continue a research direction upon retirement of the interviewee and to develop a successor. That this was considered as the interviewee approached retirement suggests a conflict between a corporate logic, with legitimacy based on the interviewee's "market position" within their field, and the professional logic's dimension of identity, based on association through technical proficiency, loyalty and prestige. Mechanisms of institutional reproduction included causation schema held by academics concerning resource competition within their field, while those of institutional transformation included obligation schema regarding continuity of research.

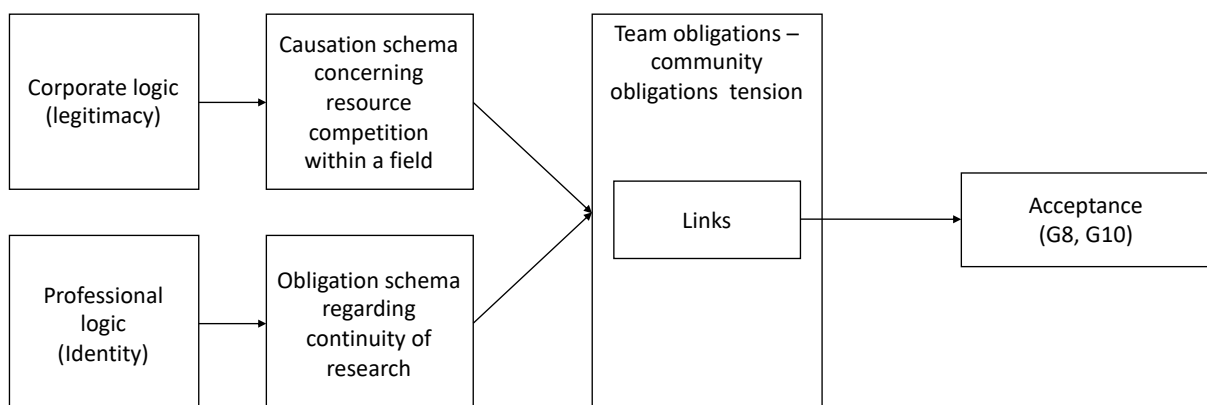


Figure 5-16 Team obligations-community obligations tension

5.2.17 Protective state – productive state

This tension emerged in the context of event sequencing related to restructuring economic and social policies along neoliberal lines based on little or no evidence. At a policy level, this may be conceptualised as a convergence between notions of authority under a corporate logic (hierarchical position as policy maker) and of legitimacy under a state logic (democratic participation). For the academic, different responses emerged depending on the congruence of the policy with what is considered legitimate under a professional logic (personal expertise in contributing to the evidence base underpinning the policy) and the opportunities for institutional entrepreneurship presented by the changing policy landscape (Figure 5-17).

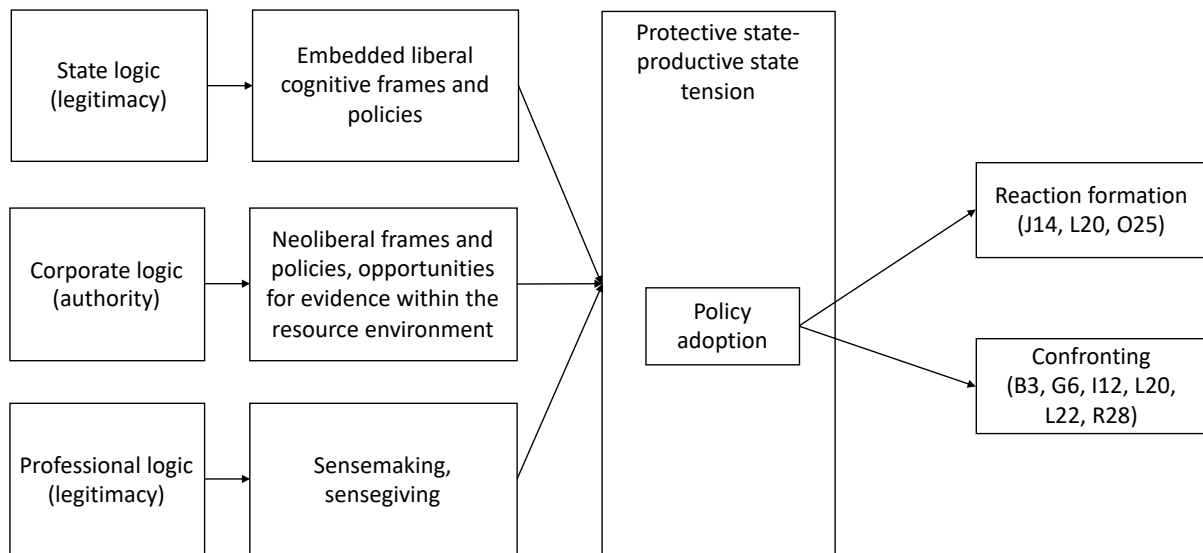


Figure 5-17 Protective state-productive state tension

Where an opportunity was open to the academic to address the tension, typically through requests made by civil society or government actors, they responded by confronting the tension through sensemaking (rigorous analysis of evidence) followed by sensegiving (knowledge translation):

“...(T)he government in the Trade Union Bill wanted to restrict (faculty time for union representatives to conduct union business), to cap it, but in the public sector. And of course this, you know public sector unions, the lot of them were just up in arms about this...Now the government was saying ‘Yeah, but you’re using this time to do all these terrible things from an industrial relations point of view. You’re fomenting discontent, you’re engaging in political activity, you’re not

doing the things that we want you to do which is diffuse industrial disputes and so on'... (We found that) members are working very, very closely with employers, very much in a partnership approach in order to do a lot of things that are very positive that will ultimately have a positive effect from the point of view of reducing labour turnover, reducing stress levels, reducing absenteeism and so on and so forth...(W)e'd like to think that we at least contributed substantially to the government research, because the government ended up saying 'Right, we're not going to introduce the facility time cap, we're going to wait another two or three years, collect some data and see where this cap should be imposed, if its imposed at all'." (L22)

Where no opportunity was open to the academic to become involved, responses of reaction formation were recorded:

"(Y)ou wouldn't necessarily be aware of the political attack that career support for both young people and adults has been under, particularly in England, not to the same degree in Northern Ireland, Scotland and Wales...(F)irst of all they completely turned careers services into connections services without any consultation or time to introduce it. And then unsurprisingly they declared connections to be completely ineffective and they disbanded it, you know having privatised it in 1999...So careers has virtually disappeared for young people in England, and you know my own view is that we now have virtually a whole new decade of new people who have had no support. And that turns into political panic around 'We can't make apprenticeships work, we've got a big skills gap, we've got increasing numbers of NEET kids'...Yes, well, I just look at the Cridland Report and I just think that, you know, give me strength, here we go again. So somebody is presenting this as some kind of amazing innovating idea, you know, if we just give people a mid-career review. And I just kind of think I've been banging that drum now for 20, 30 years." (L20)

Thus, mechanisms of institutional reproduction of the state logic are embedded liberal (Ruggie, 1982) cognitive frames and existing policies promoting social welfare, while mechanisms of transformation towards the corporate logic are neoliberal frames (Olssen and Peters, 2005) and policies promoting productivity as well as opportunities for evidence-informed policy presented to academics.

Transformative mechanisms towards the professional logic include sensemaking and sensegiving.

5.2.18 Global-local

Although the logics perspective describe contradictory practices and beliefs inherent in the institutions of modern western societies (Thornton and Ocasio, 2013, p.101), it has occasionally been deployed in contexts of eastern societies, notably China (Liu, Zhang and Jing, 2016), providing grounds for characterisation of the global-local tension in this study. This tension became salient for interviewees during attempts to enact UK-centric practices in Chinese contexts. Two examples were identified. First, the interviewee was required to obtain testimonial evidence of impact from a Chinese stakeholder, which risked damaging the relationship by offending the stakeholder. The interviewee responded by confronting the tension, using a culturally-sensitive approach to the stakeholder to obtain the required testimonial (J13). Second, the interviewee was required to introduce ostensibly novel western social enterprise concepts to China, but recognised that domestic equivalents already existed. Again, this elicited a culturally sensitive confrontation of the tension by engaging with domestic partner organisations (B3).

“In China, the social relationship was quite important and I would be very reluctant to (ask for a testimonial), we don’t want to risk the relationship...Here we can bring everything to the table, and say ‘This is what I need’ ...But if we imagine something like this happens in China, the conversation would be not so direct. You have to get the message through that you need that, but you can’t directly say that you need this. If the answer is no, then you cut off the relation. I can’t work with that anymore. (I did it) in an informal way, with a longer lead-time. You look through them, who might be prepared to, or who was able to or in the position, and who might be prepared in quite an informal way, that this is a favour I need.” (J13)

“We were sent to China to find best practice in social entrepreneurship in a country that doesn’t understand social entrepreneurship ...(T)he Prime Minister’s Initiative 2 funded a project through the British Council, and this was all about

showing social enterprise ideas are new in China and we are going to be exporting them. You know before we turned up there was the Skol Centre and various other people, America, going selling their social enterprise wares and constructing this as novel and new, this is a new way of doing things. And I'm trying to say 'Well, it's kind of new, but all the conditions have already been in place, the mentality wasn't new'...So there were lots of forays into China trying to do stuff without a really clear sense. Subsequently now, we have a much more mature relationships through Educating with Others partners." (B3)

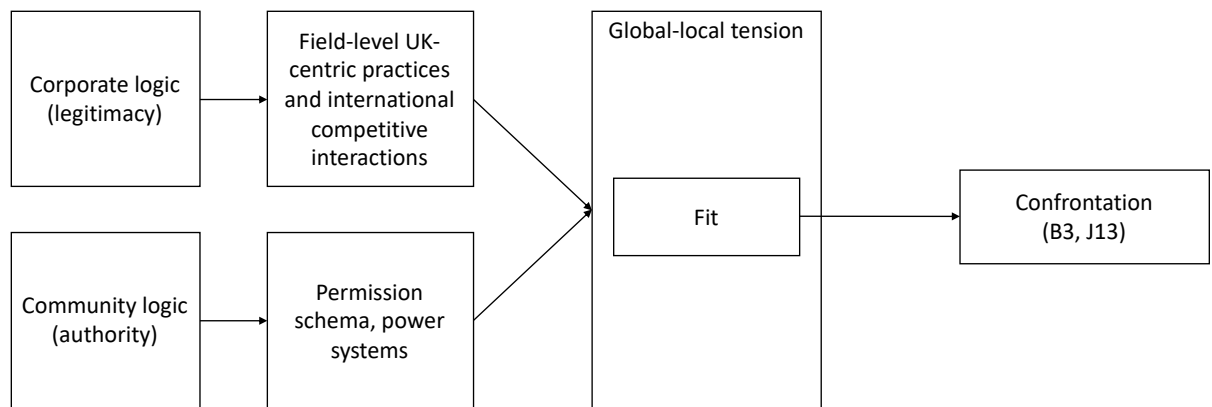


Figure 5-18 Global-local tension

On the basis of these examples, the global-local tension was characterised as being the consequence of a contradiction in notions of authority under a community (commitment to community values & ideology) and legitimacy under a corporate logic (market position). Mechanisms of reproduction of the dominant corporate logic were field-level UK-centric practices and competitive interactions between nations while those of transformation to the community logic included permission schema and power systems (Scott, 2014, p.96), i.e. existing networks of social positions. A single dimension of this tension was characterised as fit, or the extent to which an actor's interests match local community requirements.

5.2.19 Freedom-dirigisme

This tension arose across a dimension of fit, defined as the extent to which an actor's abilities and interests match requirements and rewards of the social contract for science. It concerns contradictions and convergence between different identities,

modes of authority and concepts of legitimacy under professional logic and state logics. Mechanisms of institutional reproduction of the professional logic include frames both of academic autonomy and self-assessment, category memberships congruent with Mode 1 knowledge production and permission schema concerning ownership of academic outputs. Mechanisms of institutional transformation included event sequencing within the resource environment, sensegiving activities of academic leaders and regulators, category membership congruent with impact, state-sanctioned regulatory and measurement practices (such as REF) and obligation schema concerning the social contract.

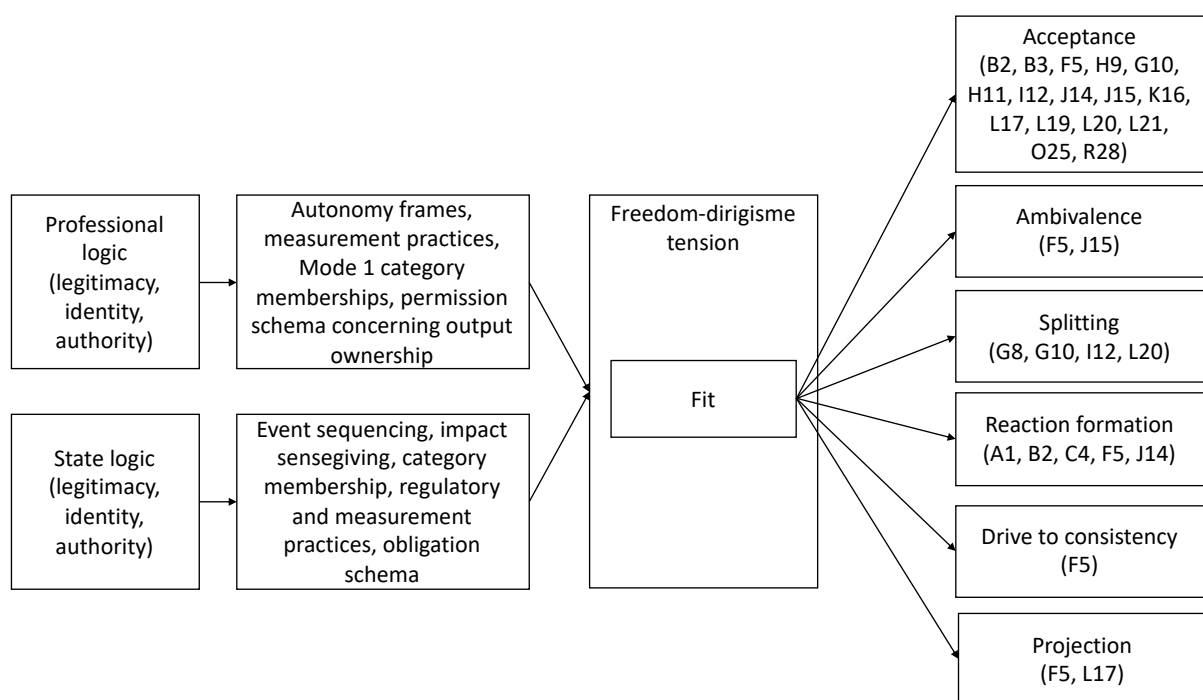


Figure 5-19 Freedom-dirigisme tension

The tension became salient in three contexts of fit: the legitimacy of impact under the social contract for science, the authority of REF and congruence of impact activities with an actor’s category membership. In terms of legitimacy, the most common response was acceptance of impact being framed as a legitimate mission of academia:

“Research had better have impact, otherwise you have baying crowds and why do I have this privileged position? I think it’s been too mollycoddled and isolated for way too long.” (G10)

However defensive responses were also noted, including ambivalence where impact was regarded as legitimate but difficult for the business school or certain disciplines (F5) and temporal splitting in terms of a comparison of past and present research environments (I12), reaction formation where category memberships did not encompass impact (J14), and a drive to consistency in terms of preference for measurement of research excellence (F5):

“(A) number of academics will continue to resist this call to demonstrate the impact of the work. Now I have some sympathy because not every discipline is as pragmatic as the disciplines that I work within. So if you’re a physicist or a mathematician, you know the Albert Einstein variety, you could develop a new algorithm that might not be tested or applicable for 20-30 years and then somebody comes along and says ‘All right, that’s fantastic, we can actually use this’. And then the true impact of that work is revealed. If you try to apply that same philosophy in the construction or civil engineering or business perspective it’s going to be a lot harder to prove, because practitioners want the here and now today. They can’t wait 3 years for some study to write a couple of research papers and a few conferences and maybe a white paper to tell them something they probably already know.” (F5)

“I was incredibly fortunate to have lived through the time when a lot of us, particularly in the field of enterprise, entrepreneurship. We were all, we were just all standing on the shoulders of the original 4, 5, 6 guys who started all of this off. And at a time when there was research money around. You still have to get it and it was hard, but it was around. Where you had room, your deans would give you room to kind of develop your career, to go off and do bits of research and get things wrong and you weren’t under so much pressure. I think the pressure now is much harder. So it’s much more difficult to get hold of research money. There is much more pressure because of the REF to publish, far quicker. You are under far more pressure if you are not going to be delivering NSS scores to be doing more teaching, it’s hard to carve out time to do stuff. I think it’s a much more brutal environment that people are working in now.” (I12)

The identity component of fit concerned the relative salience of impact and traditional academic category memberships. Responses included both acceptance (I12) and reaction formation (J14):

“(I)t annoys the hell out me because now, REF decides that its impact and now there’s bloody workshops all around the university, how to research for impact. I think ‘Great, nice one, you know, where the fuck were you about 20 years ago when I was banging my head in the hole?’ So it’s you know, I mean it’s great it’s finally about impact.” (I12)

“I don’t necessarily want to mention names, but I know a couple of high profile cases where it’s actually led to people leaving the country to go work in the US. Because they feel that they were no longer judged on objective academic research...I do know of cases where people have said ‘It’s not what we signed up to and this is not what we see as our main job and we’ve had enough, goodbye’. Now if you lose your top people that’s a real problem.” (J14)

The authority of REF provided perhaps the most complex component of fit, as various aspects of REF were challenged. Portability of outputs was raised in terms of permission schema of ownership of research outputs, and elicited responses of reaction formation (outputs was seen being owned by academics rather than by HEIs) and of projection (portability was seen as being an initiative of HEI leaders):

“(T)he Stern recommendations will get endorsed and they will come into reality. Now personally I think it’s an absolute disaster, some of them. Because if you’re an academic you can’t carry, from what I’m hearing, your impact from what you’ve done in the last 10 years if you change institution. So that means you’ve got, all of your work is now null and void and you have to start completely over again. What an absolute load of rubbish. I think that’s nonsense, academic institutions are just bricks and mortar, what we are trying to assess here is the quality of the people within the institution, not the institution itself. So I think that’s absurd.” (F5)

Accountability of academics to provide impact in return for public funding and autonomy was raised as an obligation schema, and was generally accepted (O25), although some interviewees responded by splitting the tension to grant greater

autonomy to certain disciplines or to noteworthy academics (G10) or by driving to consistency in maintaining focus on measures of research excellence (F5):

“We did a post REF analysis and the ones that seems to score well were very much aligned to the purpose of an applied business school which contributes to the economy...But I can see our impact, because it’s not always leading to clear-cut improvement in the bottom line, might not be valued as much as one that makes a clear line to business efficiency. I don’t think that’s a major problem. It might not do our score on impact factors so well, but we will just have to live with that.” (O25)

“However, if you destroy the freedom of the 10% (of star academics because of an emphasis on impact)... I’ll happily pay the tax of all the wasters around here if we protect those 10%, because if you let them get eroded by making everyone else sing, then you kill off the golden goose.” (G10)

“Academics are trying to demonstrate to government that we are making an impact but there is resistance there from academics to measure impact in a meaningful way other than trying to make some tenuous link to the quality rating of the journal papers.” (F5)

The lack of transparency of the assessment was met with reaction formation:

“I as a researcher have no idea how this was...how this was evaluated, what score I got.” (J14)

5.2.20 Rigour-relevance

This tension became salient in terms of various characters of knowledge considered legitimate under a professional logic. These have been variously categorised as know-what and know-why versus know-how (Lundvall and Johnson, 1994), knowing-how versus knowing-that (Ryle, 1971), and propositional versus procedural knowledge (Witt and Zellner, 2009). Although certain forms of propositional knowledge may become market commodities or economic resources that can be fitted into production functions (Olssen and Peters, 2005), the tension was not conceptualised as involving a market logic in order to stress its delimiting within

academic communities rather than academic-practitioner dyads, and recognising that these debates can be traced back to Aristotelian concepts of *epistêmê*, *techné* and *phronesis*. Mechanisms of institutional reproduction included frames emphasising propositional knowledge and practices associated with research rigour, while those of transformation included frames emphasising procedural knowledge, obligation schema concerning the societal role of academic research and practices associated with research relevance.

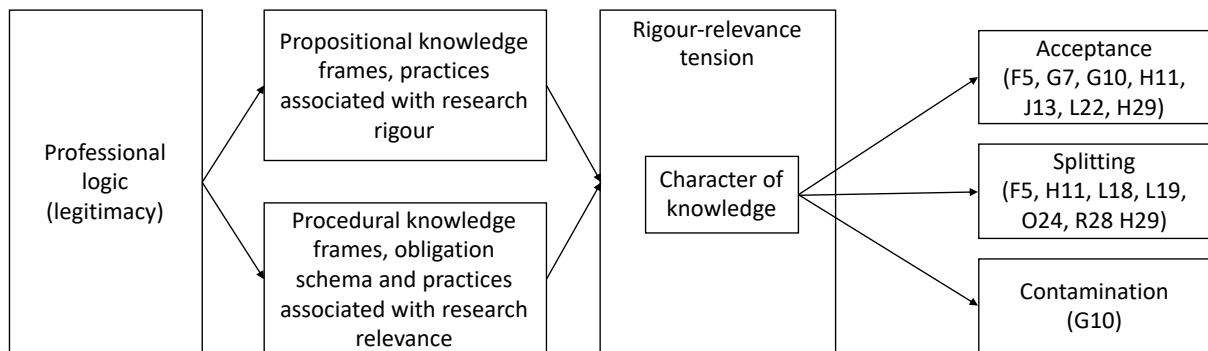


Figure 5-20 Rigour-relevance tension

Three responses to this tension were noted. The first was acceptance, as interviewees recognised the validity of both academic rigour and practical relevance of knowledge at field level, and incorporated both into their own research practice at individual level:

“Okay, we've got to have academic rigor and scientific validation, if you are writing a research paper but at some juncture you've got to then take that research and apply it in a practical setting. People within industry have to see the value of that work so. That's something I've always condoned, I mean it works particularly well for, particularly for impact.” (F5)

The second response was splitting, where interviewees recognised the validity of separating researchers into those who make conceptual or theoretical contributions and those whose research may have practical applications. The distinction was made in terms of both disciplines (L19) and HEI faculties (L18).

“In places like economics, so where you have business management & economics together, then you can argue a lot of what then do in terms of

theoretical economics is more pure because they don't engage in organisations at all.” (L19)

“I guess people are always going to talk classically about rigour and relevance. And there are I guess different games that have been played that some of the best university departments in terms of research are not the ones that are engaged with businesses. And there is this tension between the two.” (L18)

The third response was contamination, exhibited by a single interviewee who challenged the legitimacy of propositional knowledge in practitioner contexts:

“I don't know whether it's true or not that the scale of it always surprises me as well. There is a desire to be scientific, but for me that's an inappropriate paradigm for the problems I see in industry. The scientific paradigm precludes people from a lot of interesting topics. But the scale of it is surprising. If it was an anthropological study of observing business, you'd expect a small group of researchers, but it's an enormous thing at conferences and everything...it's a very odd observation.” (G10)

5.2.21 Nation state – competition state

This tension emerged in the context of event sequencing related to policy diffusion intended to improve relative levels of national competitiveness. At a policy level, this may be interpreted as a conflict in what is considered legitimate under state (democratic participation) and corporate (relative “market position” of countries within a global market) logics. This is significant in terms of deployments of the institutional logics perspective to impact contexts because upto now, the state logic has been explored only from a policy-maker or regulator perspective (Lind, Styhre and Aaboen, 2013). From an academic's perspective, however, different responses are elicited depending on the congruence of the policy with what is considered legitimate under a professional logic and the opportunities for institutional entrepreneurship presented by the changing policy landscape (Figure 5-21).

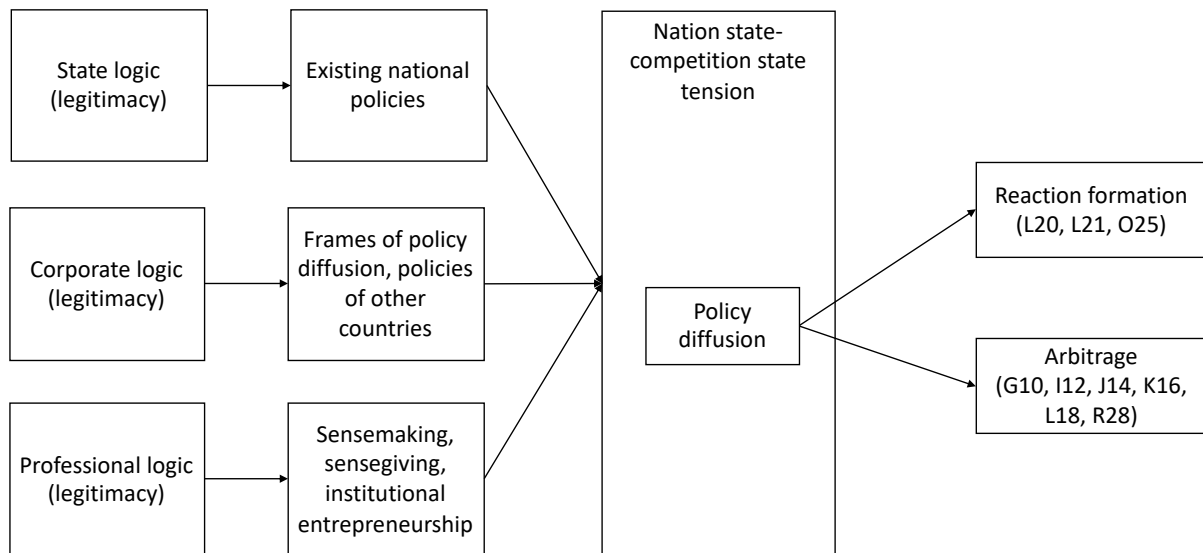


Figure 5-21 Nation state-competition state tension

Where the mechanism of policy diffusion was non-evidence-based, as in isomorphic policy learning (Foucault and Montpetit, 2014), i.e. where a government decides to adopt the same policy implemented by a reputed neighbor in order to avoid sanction by public opinion or the electorate, interviewees responded with reaction formation:

“There is (an initiative) that is just being set up by the Department of Education in its wisdom to effectively take over careers. It’s being staffed by, there happen to be young women on six figure salaries from consultancy companies like Deloitte and McKinsey. And so, and their mandate is to get...enterprise advisors into every school in England. Because if you have an enterprise in every school in England that solves the careers education problem. And they throw millions of pounds at this and it’s been up and running for 2½ years and unsurprisingly it’s going nowhere and getting nowhere...I read stuff like that and I just get furious. All this public funding, you know, which should be spent somewhere else, is literally being poured down the plughole.” (L20)

Where the mechanism of policy diffusion was evidence-based, as in a learning or efficiency process, involving policymakers’ rational behavior of collecting information on the experiences of other governments prior to committing themselves to new policies (Foucault and Montpetit, 2014), interviewees often responded via arbitrage, engaging with the alternative logics without compromising their own, and institutional entrepreneurship to persuade policy makers to pursue specific courses of action:

“(O)ne of the main pillars that (the government) were suggesting that they were going to build economic strength across this region was by creating a stock of SMEs capable of competing effectively in the international markets... getting far more proactive in trying to promote export activity. And we were trying to shift their priority...we were trying to say if an SME that’s international and exporting is only going to get support for export then you are killing half of your companies because they need help sourcing imports too. You can’t just say we are not going to support people importing because that’s damaging balance of payments because you need the strong SMEs in order to do the exporting. So that was, that was a kind of a shift in DTI. You know we didn’t, you know the old days of sticking something on a ship and waving it off had kind of gone so it was kind of an assumption, you know, governments are very behind the curve really. Because it was changing slowly and that is what we were trying to help shift.”
(112)

Thus, at the level of analysis of the academic, the mechanisms of institutional reproduction of the professional logic are sensemaking (undertaking research), sensegiving (knowledge translation) and institutional entrepreneurship, while those of institutional transformation are frames held by policy makers related to policy diffusion and the resulting policies they seek to enact.

5.2.22 Present – future temporal orientations

This tension arose across dimensions of duration, polyphony and temporal punctuation as interviewees sought to acquire symbolic and material resources from a variety of stakeholders (mobilisation). Mechanisms of institutional reproduction are cognitive, including a *Kairos* temporal frame (Reinecke and Ansari, 2015) or schema (Granqvist and Gustafsson, 2016), in which are embedded the authority dimension of the professional logic. Transformative mechanisms include a *Chronos* temporal frame or schema as well as an obligation schema concerning schedule adherence. These, however, may have embedded in them either of two logics (Figure 5-22). First, in cases of structural overlap, research project stakeholders drew upon the corporate logic which granted authority over academics based on their hierarchal position as sponsors. Second, some interviewees actively adopted a *Chronos* frame

or schema, drawing upon the market logic whereby authority was based upon accountability to funders. These academics acted as institutional entrepreneurs, modifying the sensemaking behaviour of other academics to ensure project schedule adherence.

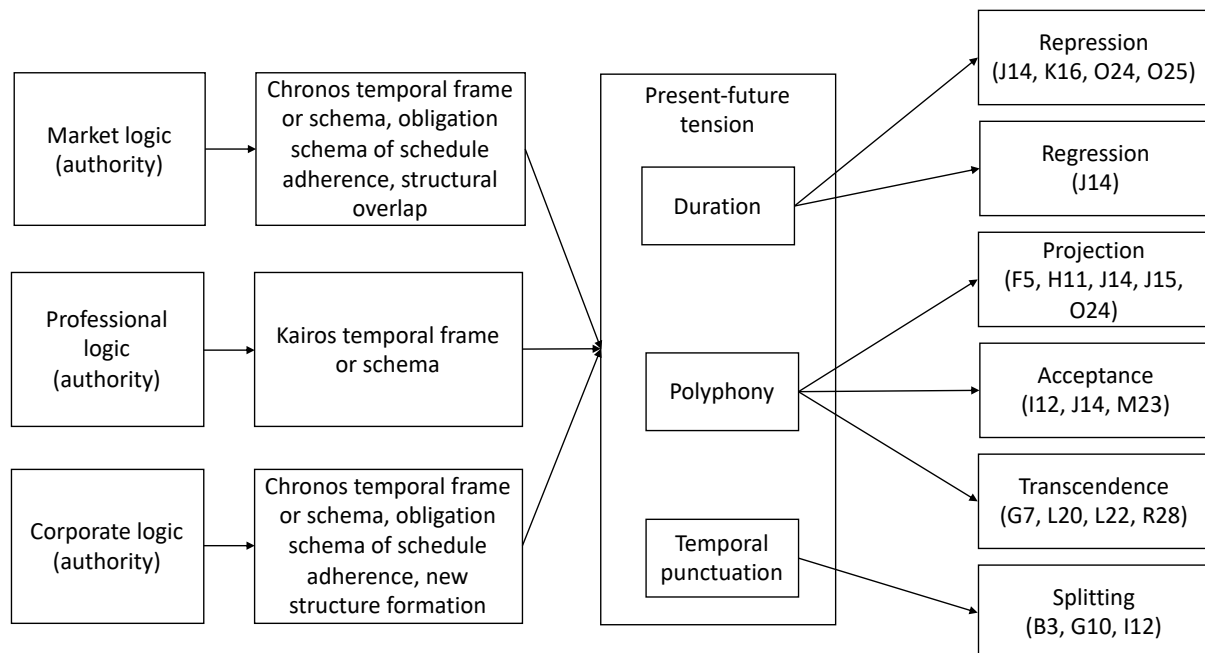


Figure 5-22 Present-future tension

In terms of duration, the tension arose in terms of how long a research project lasted. Interviewees responded by repressing their own tendency, or that of others, towards curiosity-driven sensemaking and instead pursued knowledge creation targeted at specific stakeholder goals:

“Impact research is very goal oriented, usually to be done by a fairly tight deadline. And the whims that one can do in more traditional research of just exploring avenues as they open up, really you have to focus on the goals in impact research, put blinkers on and just follow the path. It’s often done for a client and the client dictates the path... It can be frustrating because one has to put some other things to one side. The timeline often dictates that it needs to be done fairly quickly and that keeps focus on the project.” (O25)

Regression was another response, where academics lost motivation during a prolonged project and reverted to more curiosity-driven research:

“It started off, my experience in all these projects is they start off great, everybody’s enthusiastic and you have kick-off meetings and everybody is there, and then by the end, by the end of 3 years, everybody’s had enough.” (J14)

In terms of polyphony, the tension concerned interrelationships between impact and other tasks and activities of actors. This became salient in two ways. First, interviewees who experienced the tension reacted by projection onto academic leaders who required them to generate impact without taking account of their other duties:

“So they kind of wanted us to (generate impact), nobody wants to do it. It was just another thing to do. There are all these people there like HEFCE and university centrals, they think that academics have all this spare time. It’s unlimited time, never taking account of the resource constraints.” (J14)

Second, where stakeholders exhibited the polyphonic tension, interviewees responded with acceptance, essentially waiting until the stakeholder was in a position to collaborate:

“I knew the person there very well and she got it, and so she said ‘Right, let’s work on this together’ and it took us about 9 months. The day before, and she’d, they approved it all, they put it in front of the head of EDA the day before Tony Blair called the election. And it was sitting on the desk waiting to be signed, so you know once an election is called, all civil servants lose their jobs and we had to wait another year. Before Tony Blair got in and they sorted everything out...But in fact I always tell everybody pretty much, and it’s pretty much true everywhere, UK everywhere, abroad, that from first coming up with an idea and somebody saying ‘Yep that’s a good idea’ to actually getting it signed is usually about 18 months.” (I12)

Interestingly, a small number of interviewees responded by transcending this tension in the sense that they anticipated the “political zeitgeist” and engaged in leverage to mobilise support and acceptance among stakeholders before they became distracted by the tension:

“I mean, that was a piece of work that was specifically designed. We knew these debates were coming up, I can’t remember how, you just do. You know, they’re

scheduled so you know when it's going to be debated, you know when the process of a bill going through parliament is going to happen and if you can time a piece of research, you know, you can't go out and collect primary data because that obviously takes time... Or if you have a piece of research and we talked about this, how do you best time a press release. Sometimes best to actually sit on things and wait until they are topical and then release.” (L22)

The third and final dimension of the tension was temporal punctuation, or mismatches concerning expectations of when activities begin, pause and end. This was raised by just one interviewee who described how a HEI responded to the tension by splitting, or spinning out an academic project team:

“For me, it very much mirrors a process I went through at (another HEI), moving from being a young researcher, doing a bit of teaching and a bit of research and then finding that the life cycle of the project didn't match the academic life-cycle and therefore we became staffers and span-out of the university into a private organisation.” (B3)

5.2.23 Internal – external orientation

In Section 2.1.4.19, the internat-external orientation tension was defined as the preference for organisational focus ranging from internal & person-oriented to external & organisation oriented. This was instantiated at an individual level along a dimension of fit, defined as the degree of congruence between an individual's interests in impact and organisational (i.e. either school or HEI) collective identity and practices. The tension is characterised as a contradiction between notions of legitimacy (market position) and authority (hierarchal position) under a corporate logic, and identity (association through technical proficiency, loyalty and prestige) under a professional logic.

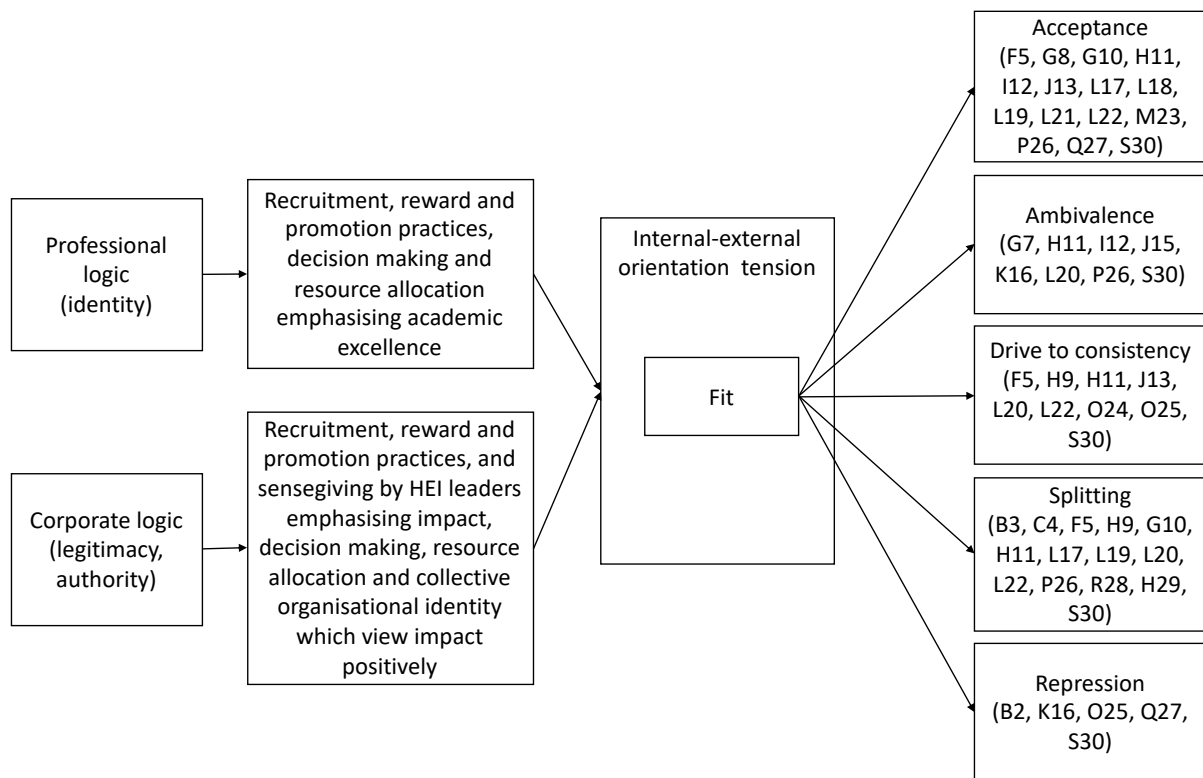


Figure 5-23 Internal-external orientation tension

The predominant strategic response was acceptance as interviewees reported that organisational focus on impact was legitimate. This focus was expressed through recruitment, reward and promotion practices incorporating impact (Q27), sensegiving mechanisms of HEI leaders emphasising impact, decision making and resource allocation which supported impact (P26) and a collective organisational identity which viewed impact positively (M23):

“Without these (REF case studies), we wouldn’t have gone into the business UOA, we would never have submitted. I made it possible for us to submit. (T)hat really gave my, gave me far more credibility in my role...I did get my chair, I was made a professor after this...But it certainly would have been noticed on my application that I did provide the case studies for REF. So there is no doubts that it impacted on my role in terms of making me more credible to my colleagues...And the bottom line is that the business school would not have gone in without my work.” (Q27)

“Well I think the move towards making impact more important as it says in the criterion is a good one. I always had the opinion that as a business school, that

was an important thing to do. And we have always done it. But this gives me an extra lever to tell my people 'Look, we get recognised for it now too rather than just doing it for societal benefit, for their own pleasure of making a change out there'. So I think that move is good. I think we need to move further in that direction" (P26)

"The sense I got from REF2014 was impact...traditional universities were struggling quite a bit, you know, in terms of impact and identifying that. Whereas for us, it's very much applied research. To us, it was hurray, you know, we were able to do it, we did quite well out of impact In the REF submissions that we had. So for us, it was... a good thing." (M23)

Four predominant defensive responses were noted. First, a drive to consistency whereby schools or HEIs maintained a focus on traditional measures of research excellence (L20). Second, splitting whereby impact was emphasised by schools or HEIs as legitimate only for certain cohorts of faculty (S30), or where reward practices emphasised returns to the HEI at the expense of the individual (L20). Third, ambivalence whereby interviewees were personally supportive of impact but noted associated negative effects (P26). Fourth, repression which was noted only in the case of teaching-oriented universities where research was deprioritised at HEI level (O25):

"I have attended to (business school) discussions they have been having and their values and judgement do not actually seem to have changed. They are still banging on about 4-star articles and impact and its still, you know, they are not, my understanding is they are not prepared to consider other types of publications or other types of impacts. Which is an incredibly, let me put it like this, constrained view in my opinion. However, its, that is where we are and certainly you know, our director is still saying to everybody in the institute. And these are messages that we didn't get 7 or 8 years ago until we got a new director. So he is getting messages from the university that he is transmitting to us and he is basically saying to people 'This is, you know, you had better understand that this in non-negotiable. You either get your four 4-star publications or else', and the or else has got a question mark at the end of it." (L20)

"I think for early career researchers, the bar is not set yet in an expectation of going to provide a three or four start impact case study for REF. It's a case of, as you say, focus on your papers, focus on, you know, extending your PhD and your theoretical knowledge. And maybe just see how it goes. But I think where the pinch point to something is probably for more established researchers. And I think particularly... I mean it's just so performance driven isn't it?" (S30)

"(This) is something I get very cross about. I mean, obviously (my REF submission) has benefitted the institute because funding has followed the impact case study to the institute, but at the level of the individual, and I don't know how this translates across the university. But as an individual I have benefitted in no way whatsoever... So, we've had, no additional financial resources, we haven't even had, you know, a public vote of thanks, you know it's, we haven't been offered study leave, nothing, absolutely nothing. And I said to my director, because he wants me to do another one, 'Why the hell would I do another impact study? Why would I, after what happened last time?' And you know he kind of blinks at me in total amazement... You know, because what you are doing is just take, take, take, take, take and there is not even a congratulations at the end." (L20)

"I think even academically recognising impact in terms of promotion and in terms of recruitment should become more important. It's a tricky thing to do. I mean, when I see the CV of somebody applying who has high impact, I get excited. But then when I don't see the publications, I think it's going to be hard for me to get that person through the promotional levels. So there is a difficult conflict there, even with my personal choice, even as director of the school, I can't just say 'Look, we are going to be more about impact' because we get evaluated by others, by peers in the field. Both when we submit research but also when we have promotions, reference panels. So the whole system needs changing globally, even the UK on its own can't make that change." (P26)

"(W)e are primarily a teaching institution. So it's all about getting numbers of students. And our principal income was coming from Asia, either teaching in Asia are getting in Asian students on campus. So the focus has all been market driven from a student's point of view. But it is frustrating because if they just

wake up and see how some of the more research focused universities are doing.” (O25)

5.2.24 Centralisation – decentralisation

This tension emerged along a dimension of fit, defined as the extent to which an individual’s interests match organisational structures. It is characterised as a contradiction between notions of authority under corporate (hierarchical position) and professional (professional association) logics. The mechanisms of institutional transformation towards the corporate logic are centralised administrative structures and their decision-making processes. Mechanisms of institutional reproduction are frames of academic autonomy, collegial decision making practices and the micro-practices (Smets, Morris and Greenwood, 2012) which develop between academics and practitioners in the course of collaboration.

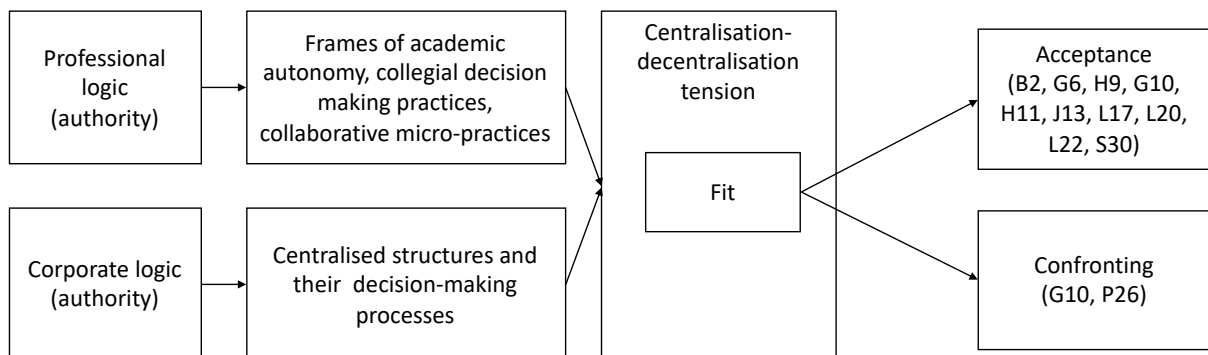


Figure 5-24 Centralisation-decentralisation tension

The tension as raised by interviewees typically concerned their interactions with centralised school or university structures designed to develop and support links between the university and external actors (such as funding councils or industry). All responses were strategic, with the predominant response being acceptance as interviewees worked with these structures, although often experiencing difficulties in doing so.

“(W)e’ve got (a central support structure) and they have a lot of staff and they are there to help support people doing impact work. And they’re very good and they try to be very helpful but I’ve often sat in meetings with some of them when they’re trying to support impact cases. And sometimes I thought ‘You don’t really

understand an academic's life. The maximum amount of hours they're going to have for an impact case is one day a week, maximum, and most will not get that amount... You need to be helping them target so that actually all becomes manageable'... It's not a profound disconnect but I have been saying that there needs to be training for these people because the impact is what they do. But for an academic, it's impact, research, papers, teaching, admin.” (S30)

Additionally, a small number of interviewees responded by confronting the tension and socially constructing a new understanding with the central support structure to facilitate external collaboration:

“(C)ontracting and so on, tendering and all that is actually a difficult process that universities are not particularly well set up for. So especially with (this) project, it was very hard to get an original contract signed because of (the HEI) being very anxious about our intellectual property being given to (practitioner collaborators). (That was resolved through) long negotiations and basically me telling (the HEI) that it's okay, you can relax, you don't have to be that strict, this is a nice collaboration, I know these people, they are not going to take advantage and all that. But basically I had to manage the relationship...I'm assuming it's improving, but it still a bit of a problem...This is a collaboration that creates intellectual property, but not a product. They are not set up to do this very well.” (P26)

5.2.25 Control – flexibility

This tension emerged along three dimension of fit, links and sacrifice. Fit concerns the extent to which an individual's interests match organisational management styles. Sacrifice concerns the totality of losses individuals incur by leaving their organisations. Links concern the extent of ties individuals have with other people and activities at work. The tension is characterised as a contradiction between notions of authority under corporate (hierarchal position) and professional (professional association) logics. Mechanisms of institutional reproduction raised by interviewees included frames of academic autonomy, obligation schema concerning faculty membership, role identity as a faculty member and disciplinary-oriented structures. Mechanisms of transformation included directive, reward & performance

measurement practices, managerial sensegiving, context-oriented structures and category labelling.

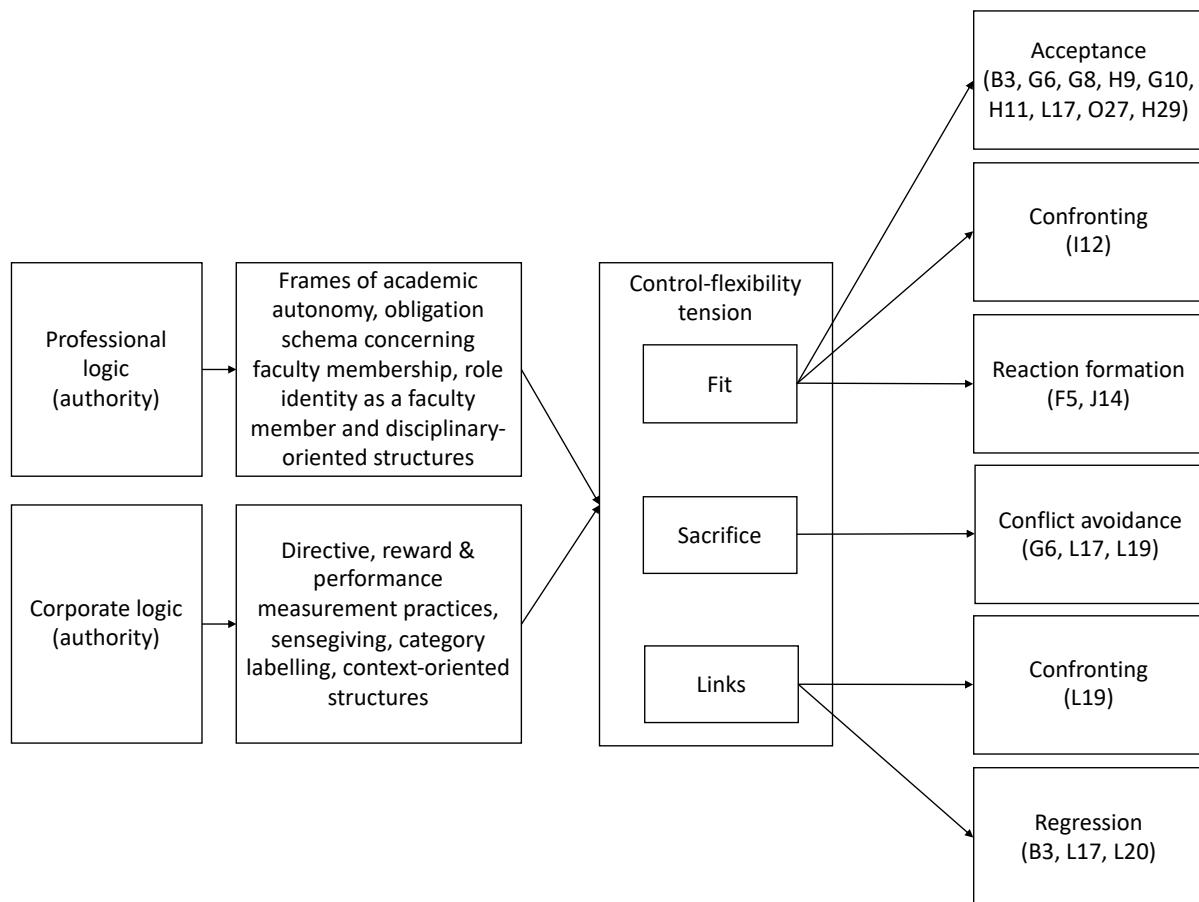


Figure 5-25 Control-flexibility tension

In terms of fit, interviewees predominantly accepted the tension where university leaders utilised soft managerial modes of control (Olssen and Peters, 2005) such as high-level normative performance expectations (G6), reward practices (G8), sensegiving (H9) and category re-labelling (B3):

“So there is quite a lot of pressure to produce the outputs, fair enough. But unlike quite a lot of universities, people are pretty free to produce them in the way that as they see fit. And providing you do your teaching and are a reasonable citizen and you produce research outputs, then everyone’s happy. There is no expectation that you have to report to your desk at 9 o’clock and work, which is great for me.” (G6)

“And I think that’s actually another way that the business school is very supportive here...The line that the university has always taken is basically we

want you to do a day a week of other work with other people. And if you get large sums of money for doing that, that's fine, they don't mind about that. So the trade-off, if you like, as well as being able to work on the things I've been interested in doing is that I've effectively being able to get fairly sizeable consultancy projects that paid me separately from my university salary. So I've been able to support my family through these sorts of things, rather than having to do lots more executive education, teaching or whatever it might be. And it's only because the university has that policy that I've been able to do that.” (G8)

“So that's something, yeah, getting the right people engaged, getting enough people engaged (in impact) is an issue. I think we're doing better now than we did when REF first began in terms of prioritising, communicating clearly to the staff that this is a good thing, that we want practitioner engagement, that we will have internal prizes and all that kind of stuff. We need to say the institution, not just the business school, the institution celebrates impact and you won't be considered to be wasting your time going into these collaborations.” (H9)

“in 2013, we become the first changemaker campus. At the time, I thought this was just the institution going to tick a box, but actually it becomes a language that crosses the whole institution, out of the business school. The business school and the language around social enterprise was really about creating social enterprise. The School of Health, the School of Education, Arts and Technology...the changemaker allowed them to think ‘Well, we do stuff around special needs, well actually we are a world class centre in special educational needs, is that change making?’ Yes, that's change making! It's not starting a social enterprise but it is having social impact. And it's ‘Oh right, we are now on-board with this whole social innovation, social enterprise changemaker sort of gubbins’.” (B3)

Utilisation of more hierarchal modes of control elicited defensive responses such as reaction formation (F5), and when taken to extremes, conflict avoidance by actors leaving the HEI, thereby generating sacrifice as the second dimension of this tension (L19). Occasionally, however, hierarchal modes of control elicited a response of confrontation in the form of a framing contest (Werner and Cornelissen, 2014) (I12):

“I think the initial dean I had in the business school, he was brilliant, and he gave me a free hand to get on and manage research and in all fairness, we were going to submit 15 people for REF which was then cut down to 5 which, you know, is really low but...We then had another person come in who was very autocratic and to be honest that doesn't work with most academics, I know, it's something like trying to herd cats. So I came over here and I've now got another dean who is, you know, fairly open and receptive to new ideas and doing things differently. So I'm comfortable again back where I wanted to be.” (F5)

“They lost a lot of the academics that produced the impact. There was a new dean, so a lot of the academics, because there was a lot of love for the university, none of us wanted to leave. But there was a new dean who had a particular way and lots of people left and took a lot of impact with them. Well, hopefully the new dean now has learned from the old dean's mistakes. I like to think that things are calming down a bit, whereas before it was just a regime basically.” (L19)

“And the deputy (VC) was also an engineer and really kind of an aggressive guy. And I have to say as a consequence of our, it was a proper argument that lasted almost an hour and half at this meeting, I actually changed the view of the entire university. And the way that that was manifested was that when you become a professor you have 3 different levels of professorship...and the only way to move that, you had three things that you had to achieve and impact didn't exist. It was all about your research grants..., your influence..., your publications. And as a consequence of that, that got changed and impact was included.” (I12)

In terms of links, the tension arose in the context of efforts by the HEI to differentiate elements to cope effectively with its external environment while integrating various elements into an organisational whole. Strategic responses were the exception, such as the interviewee confronting the tension by seeking to form new collaborative communities across university departments:

“We're made up of two former departments, the School of Management and the Department of Economics, and they were quite standalone before. So a big part of my role, I've been here just under a year now, is to go out and link with other parts of the university. Then what we've got is other parts of the university

recognising that we have the potential of a strong business school, they want to come and work with us.” (L19)

More common was the defensive response of regression, where efforts made to incorporate external elements into a university, department or school were not successfully integrated into an organisational whole. This response was noted in terms of the applicability of traditional reward practices to professors of practice (L17), the difficulties of collaboration between organisational units structured along traditional disciplinary or context-specific lines (B3) and the increasing focus on profitability of research centres (L20):

“There is very much a divide between academics and professors of practice, which the school is also starting to bring on. There are a number and there is very little contact really, I think there is very much emphasis on ‘You’re a proper academic if you publish, and that’s it’. That’s the culture.” (L17)

“We’ve gone from having a number of institutes and centres and doing lots of things to having them all closed down, then recreated as institutes of health and well-being, which then becomes not a separate organisation but organisationally separate, has its own staff etc., very little contact with the academics. I tried to relate to them and work through them but it’s never quite works.” (B3)

“I think there is a big question of the future for independent research centres at (the university). You know, a number have closed down or been merged recently and I think it comes back to the argument around financial viability inevitably...I suppose over the last 4 or 5 years, some research centres have found it really tough getting income because, like I said, we are wholly dependent on research income.” (L20)

5.2.26 Subjective – instrumental value

This tension arose with regards to competing value-rational and instrumentally-rational frames concerning the role of business and management research. Interviewees referred to two roles, one socio-critical and the other utilitarian. In doing so, they implicitly evoked Kant’s (1979 [1798]) differentiation of roles of the

philosophy faculty and the faculties of law, theology and medicine, which emerged well before the University was exposed to market forces. This is significant because, while the professional-market logic dichotomy is predominant within explorations of institutional logics within an impact context, a morally embedded perspective reveals an alternative conceptualisation concerning conflicting humanistic and utilitarian frames of legitimacy under a single professional logic (Figure 5-26).

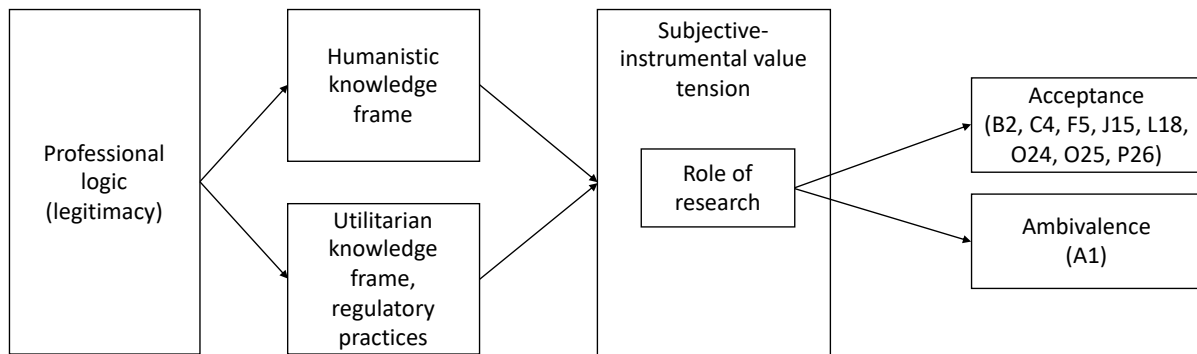


Figure 5-26 Subjective-instrumental value tension

In terms of responses, interviewees predominantly acted strategically by accepting the legitimacy of both humanistic and utilitarian knowledge, without necessarily linking this to their own category memberships or personal goal preferences:

“It’s a continuum. So one extreme, applied research is very much what’s the pressing issues faced by the client, or whoever is funding your research, or the agency you are trying to support...Now then we are going to the other extreme where, you know, good academic research can affect, influence, society but I don’t think it does actually, very much. I think the vast, vast majority of academic research does not... there are some exceptions, a bit like...David Birch (or) Piketty.” (O24)

The lone defensive response (ambivalence) was made by an interviewee suggesting that the field-level regulatory practice of impact measurement also acted as a mechanism of institutional transformation towards utilitarianism.

“Impact is perceived with very narrow parameters, and it has to be evidenced in ways that are very difficult. For example, if I think of a colleague of mine who did something on water privatisation, she was then asked if she could say how many peoples’ lives had been saved. So the ways that grounds of REF or RAE are

organised means that you have to deliver very short term impact, so those narrow metrics I don't think reflect a wider impact.” (A1)

5.2.27 Insider – outsider

This tension arose as academics attempt to form links to other actors within existing circuits of knowledge. It is characterised as being the consequence of a contradiction between a community logic within the circuit, with identity based primarily on reputation or emotional connection, and a professional logic with legitimacy based on reputation and personal expertise. Mechanisms of institutional reproduction were structural (existing academic power systems in which focal academics were insiders) and cognitive (causation schema concerning costs associated with engaging with circuits of knowledge and the detrimental impact of this on research weighed against potential benefits). Mechanisms of institutional transformation or construction were also structural (circuits of knowledge as power systems) and negotiations with these systems intended to gain access).

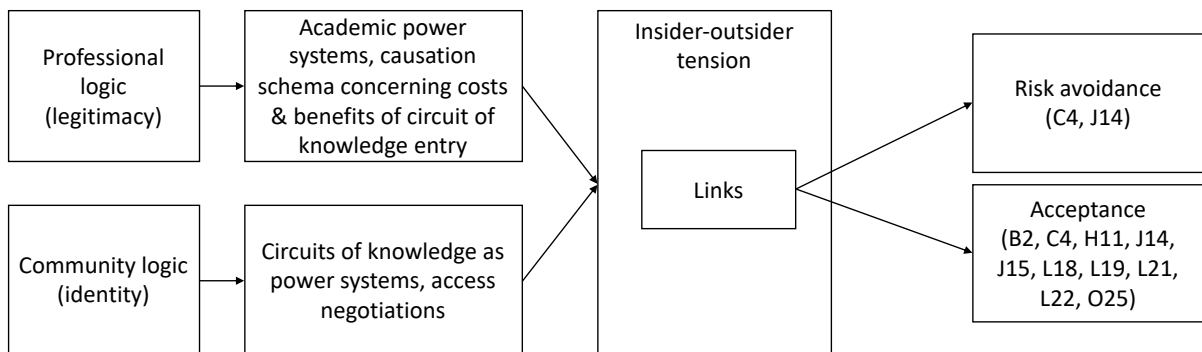


Figure 5-27 Insider-outsider tension

Two responses to this tension were noted. The first was risk avoidance, whereby academics avoided the costs associated with pursuing access to practitioner networks (J14):

“We have academic networks; we don't have very good end user networks. So in order to identify those, to engage with these people involves a lot of effort and resources. Not necessarily money as such, it's more the, more the time, time, time is the constraint for all academics and finding the time to do both the research and then generate the impact is very difficult.” (J14)

The second was acceptance, where academics decided that the potential benefits of engaging with practitioner networks outweighed the costs of link formation (L18). Once this decision was taken, access negotiations followed which may or may not be successful (J15):

“So if you want to influence policy and they want to gain policy or gain knowledge of what sort of policies would be available, then you’ve got to make the links personally.” (L18)

“Talking to alcohol companies is almost impossible. It is very, very difficult, because I’ve done some work since... well I’ve tried to talk to alcohol companies. It’s like, you know, part of the reason is that there are some academics who are so anti-alcohol companies that they just know that they are going to get a beating. But in (one) case, Diageo contacted us and I think what they wanted was to get as much out of our findings as possible... You know, you think that if you started a dialogue, you might continue with it, but I think they were very focused on ‘Okay, let’s find out as much as we can’.” (J15)

5.2.28 Nodal proximity – distance

This tension concerned proximity-related conflicts or convergence across links between the interviewee and both academic and practitioner collaborators. It is categorised as involving a community logic, with identity based on emotional connection, ego-satisfaction & reputation, and a professional logic, with identity based on association through technical proficiency, loyalty and prestige.

Mechanisms of institutional reproduction included collective local or regional identities, organisational strategies of universities for place-based impact, leverage and convening. Mechanisms of institutional transformation or construction included obligation schema concerning role responsibilities as a faculty member and historical dyadic relations.

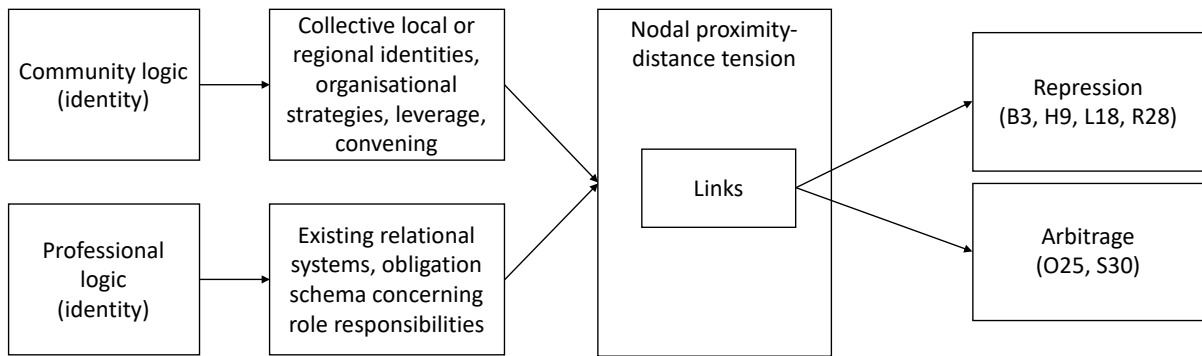


Figure 5-28 Nodal proximity-distance tension

The predominant response to this tension was repression, as interviewees described establishing links with geographically proximate collaborators through leverage and/or convening (processes of institutional change jumpstarted by the creation of collaborative arrangements) (Dorado, 2005). These were underpinned by collective local or regional identities and organisational strategies:

“Part of our strategy is about making a positive impact on the community, the education, the business, the economy, of greater Lincolnshire, for example. So that's there, that's explicit. So that's almost become part of a value system for most universities in different ways...it's part of the DNA. You look at the industrial strategy, the notion of place, the notion of significant local institutions, there is a lot of buy in to that. You could almost say it's part of the contract between universities and society.” (R28)

A much less common response was arbitrage, as interviewees described working with geographically distant actors and the challenges this presented (S30).

“I suppose I have a difficulty with time. And how you keep the different plates spinning. Between just doing all the bits of work. Particularly because the stakeholders wouldn't necessarily be based locally. They would be based all over the UK, so there would be travel time, time away from home, Time away from teaching. If you put every day that I spend away for example, it was like a mad catch up when you go back and, you know, colleagues are often not best pleased that you weren't around.” (S30)

5.2.29 Cohesive – diverse relationships

This tension arose in terms of active management of network link formation by focal academics. It is characterised as being of a consequence of a contradiction in collective identities between community (emotional connection, ego-satisfaction & reputation) and market (science as a business) logics. The mechanism of institutional reproduction of the community logic was existing power systems, while that of institutional transformation was decision making within such systems in which strategies for network heterogeneity were agreed.

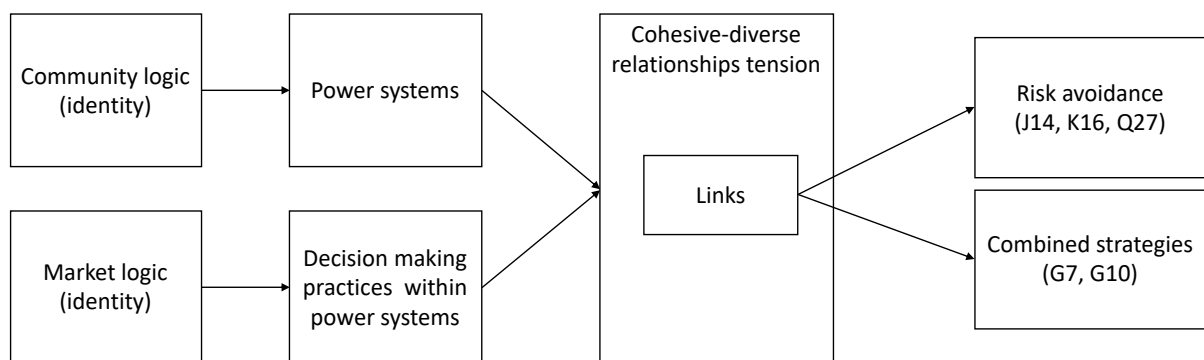


Figure 5-29 Cohesive-diverse relationships tension

Two responses to this tension were noted. The first was risk avoidance, whereby interviewees chose to work with strongly tied partners:

“So we knew each other and we had, most of us have worked with each other before so we kind of knew where we were coming from.” (J14)

The second was a combined strategy, where interviewees managed an academic/practitioner research network in order to maintain strong ties with established partners while periodically introducing new partners:

“That was a big debate because we didn’t quite know. Some firms strip mine the value (of network membership) because they basically move faster than us. Some of them say ‘Shall we up the game and move forward together?’ Churn basically was the aim. From the beginning we accepted that maybe 10-20% churn is healthy. So you get people coming and going every year for a new programme.” (G10)

5.2.30 Knowledge exploration – exploitation

This tension arose during actual or potential knowledge diffusion to practitioner cohorts. It is characterised as being of a consequence of a contradiction between legitimate knowledge under a professional logic (reputation & personal expertise) and a market logic (successful innovation). Mechanisms of institutional reproduction and transformation are discussed below.

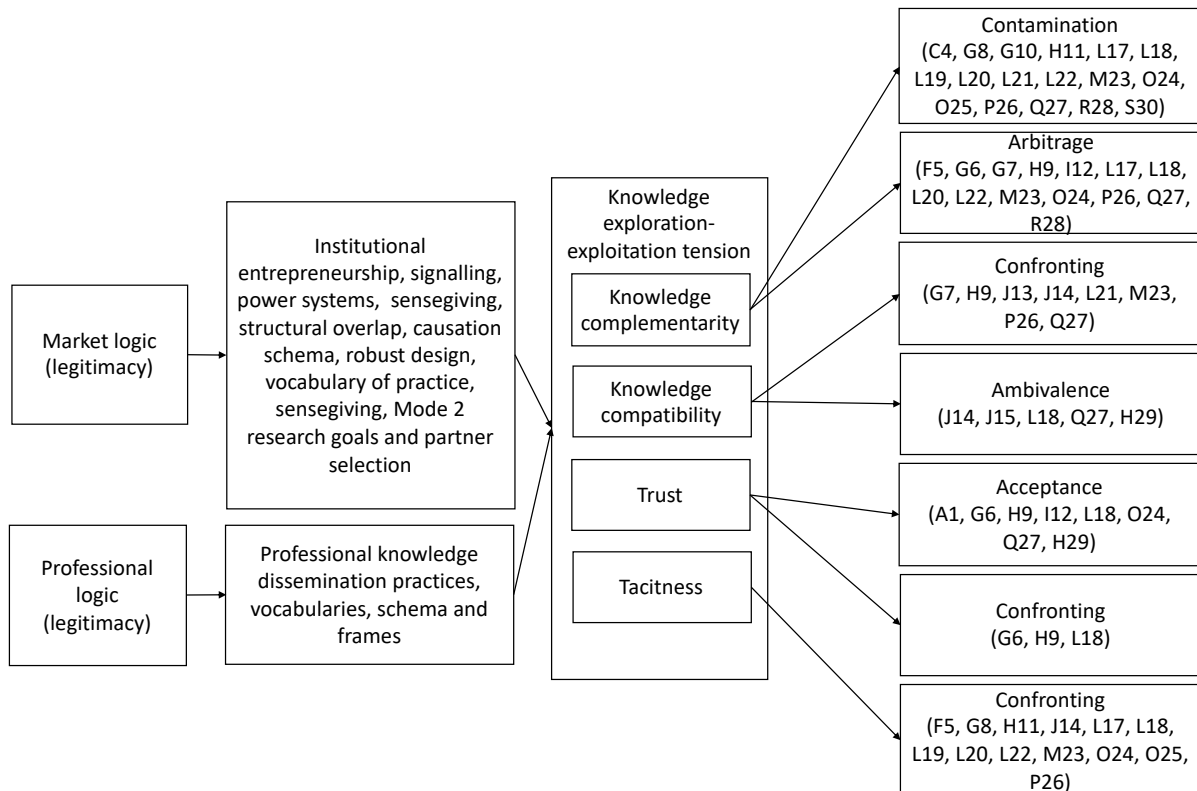


Figure 5-30 Knowledge exploration-exploitation tension

The tension arose along four dimensions of knowledge embeddedness: knowledge complementarity, knowledge compatibility, trust and tacitness (Nielsen, 2005).

Regarding knowledge complementarity, the predominant response was contamination as academics engaged in institutional entrepreneurship seeking to have their skills and resources accessed by practitioners, either in commercial (C4) or policy (H11) contexts:

“This (collaboration) was not done because I was an ex-partner and they liked me or anything. It probably helped and it certainly got me initial access. But they saw a commercial proposition, they could see this would be good for them, it would give them a sort of a different perspective that they haven't had.” (C4)

“...(I)t then became clear that the innovation, the technology wasn't being taken up because there was a lack of evidence for the benefits. So we recommended to the Department of Health that they commissioned a systematic review of the evidence around the world. Which we led, or I led. Which was presented to the Department of Health, then from that they said let's do the whole systems demonstrators programme to try and get the gold standard evidence.” (H11)

Another common response was arbitrage, as academics engaged in signalling (Fontana, Geuna and Matt, 2006), i.e. voluntarily disclosing knowledge to less informed economic agents to convince them of their attributes, and were subsequently approached by practitioners in both commercial (F5) and policy (M23) contexts:

“...(A)ll those sort of professional institutions, they have publications and if you appear in their publications you get inundated with practitioners all asking you, you know, whether you can come and have a look at their work or whether they can come and speak to you about problems they've got. And that's where you begin to not only develop your industrial contacts and networks but you can then get stronger access to actual data.” (F5)

“There was a group in Macedonia working in the university and said 'We've checked you out there, you know, we want you to use your expertise to start looking at developing an infrastructure for students in Macedonia'.” (M23)

Along the dimension of knowledge compatibility, various responses were noted. The predominant response was confronting the tension as academics sought to increase knowledge compatibility between them and collaborating practitioners. Various mechanisms were employed, including power systems (J13), sensegiving (L21) and structural overlap (Q27).

“We don't really start from scratch with anybody. A lot of the collaborations were existing relations, either in (this university) or when I moved to here. We work with the people who are used to academic collaboration. If there is one or two newcomers, that is a long-term collaboration over a number of years. Some of them know how to work with industry.” (J13)

“(T)here was some sort of continuity between departments and agencies but then other times people would change, quite regularly..., if somebody went off on maternity leave and so on. So sometimes you had to restate the case but there was generally somebody around who had been, was aware of our work and our sort of continuing links with them...(I)t was never on the line, the sort of thing with somebody coming in and saying ‘Well I don’t understand what you are doing, I don’t believe in what you are doing’.” (L21)

“The research was done in the organisation so that two PhD students were constantly there. In the details of impact, it talks about the training workshop we had. So yes, for the communication there was informal, where the student was there working and then somebody might go ‘What about so-and-so?’ But then at the end of the project, there was these formal communications.” (Q27)

A second common response was ambivalence as academics held a causation schema noting that collaborations would have been improved with greater knowledge compatibility between partners:

“Part of it too with economics, it's the shortage of people working in the government economics services. Different, I guess, in other disciplines, but economics, I guess, there really is a shortage. I guess part of it was cutting costs and getting rid of the jobs, it was just that people who did have the knowledge were doing another thing. It's a real shame and I don't see it going back, I'd love to see it go back to that but I don't see it coming back.” (J14)

Along the dimension of trust, the predominant response was acceptance as academics worked to establish a trust causation schema concerning competence trust (O24) (expectation that a partner will perform their role competently) or contractual trust (A1) (predicated on both partners keeping promises) (Sako, 1992, pp.37–40) to ensure commissions from practitioners:

“We were known, through seminars and workshops etc. in Glasgow, to know quite a lot about employability and also a little bit about family and we then, the Scottish government, we got a couple of projects for them. Just small £10,000 ones but they had to be done quickly, like one was in six weeks over the summer

so that was our summer holiday out. So they tested us out, can we deliver useful reports to them and can we deliver on time” (O24)

“I was aware from years ago that you had to, before you start something, try to anticipate the way it might pan out because again somebody who was here, who wasn’t a particularly close colleague of mine, got access to a union and then went away and was very critical of them. And I wouldn’t particularly want to do that.” (A1)

Other academics confronted this tension by actively seeking to persuade practitioners to trust them. This was observed in cases where early career researchers were chaperoned in collaborations where competence trust was low (H9) and where academics engaged in knowledge transformation (van de Ven, 2007, p.26), or political processes of negotiating and defining common interests (G6):

“(A)t the younger end of your career, you're less credible, so you approach a practitioner organisation and you say ‘Hi, I did my PhD last year...’, evidently it is going to be less successful. So the solution to that problem is...where you go in in collaboration with someone, so you go in with a senior member of staff who is not so concerned about establishing their reputation, who has a little more time to invest. You can learn the ropes of how to interact with a firm in that way.” (H9)

“(A) lot of the people unfortunately that need to put this stuff into action are the managers and administrators. So you often get a turkeys voting for Christmas scenario...The ways I try to overcome that are to depoliticise it, to establish the notion that efficient and effective public services should be available for everyone, should be an apolitical concept. Who would argue that you shouldn’t have efficient and effective public services? So it’s about saying ‘We need to focus on the end citizen’...to emphasise the increased democratic accountability and the inclusiveness you get if we get this right.” (G6)

Along the dimension of tacitness, the predominant response was confronting the tension as academics sought to translate knowledge through a variety of mechanisms, including robust design (Hargadon and Douglas, 2001) (G8), the adoption of a vocabulary of practice (M23), sensegiving through producing guidance

documents or holding presentations (F5), Mode 2 research goals (L19) and identifying receptive practitioners to engage with (H11):

“(The model) wasn’t a blackbox. It’s an Excel workbook with an added subjective uncertainty analysis. So (practitioners) could come here, I talked to them for about half an hour, give them half a day of training on how to use it. They took it away to the Treasury which is where they were based. They changed the parameters in there, which you can do. It’s all set up so you can put in your own subjective distributions for things that you believe in. they ran the model and used it for themselves, checking back with me all the time, is it doing what you would expect it to and so on. So they liked the fact that it was transparent.” (G8)

“Definitely when you talk to commercial partners you will change your vocabulary. I remember visiting someone for a potential project, it was a company looking at web2 technologies. And they said ‘Oh, we’re got a partner with another university. We don’t understand what the academics say’...(S)o I think vocabulary has to change when you’re talking to commercial partners and businesses you know. Because they don’t want that jargon, they want to know exactly what to do.” (M23)

“(P)art of the dissemination strategy that I used was to actually turn that research into practitioner guidance that a practitioner could then pick up and read and understand the research and understand how they could apply that research in a practical setting. And that works really, really well with practitioners and resonates well with them.” (F5)

“There were challenges throughout in terms of getting time, and we’d go up and do workshops and people wouldn’t turn up. Then we changed methodology so that rather than having workshops, we’d go into outpatient areas and do it in a slightly different way... there are some great examples where people were just not engaged and then they really got it. There were a number of nurses with low morale and it really changed around. Seeing the simulation changed their minds. Because they thought... they didn’t have a lot of control over what they could change and they looked at it and thought ‘There’s things we can do’ and they realised that some of it was their fault, it wasn’t all the doctors fault.” (L19)

“But in terms of selling the results, I’ve always been quite good at identifying policy customers or industry customers as well as doing academic papers...I understand how they think. So it wasn’t difficult selling the results to policy customers and industry...(by) keeping things simple and finding the right person to talk to, understanding the policy cycle, timeliness, or if its industry, just being able to talk in the right kind of language really. Step away from the academic findings to the implications for you as a business.” (H11)

5.2.31 Performing tension

This tension arose as a consequence of diverse goals and strategies of academics and stakeholders within research projects. It concerns contradictions between modes of authority under professional (professional association) and corporate (hierarchal position) logics. Research strategies and goals oriented towards accumulation of scientific credibility constitute mechanisms of institutional reproduction of the professional logic, while those of institutional transformation include goals of project stakeholders and collective decision-making carried out between researchers and stakeholders.

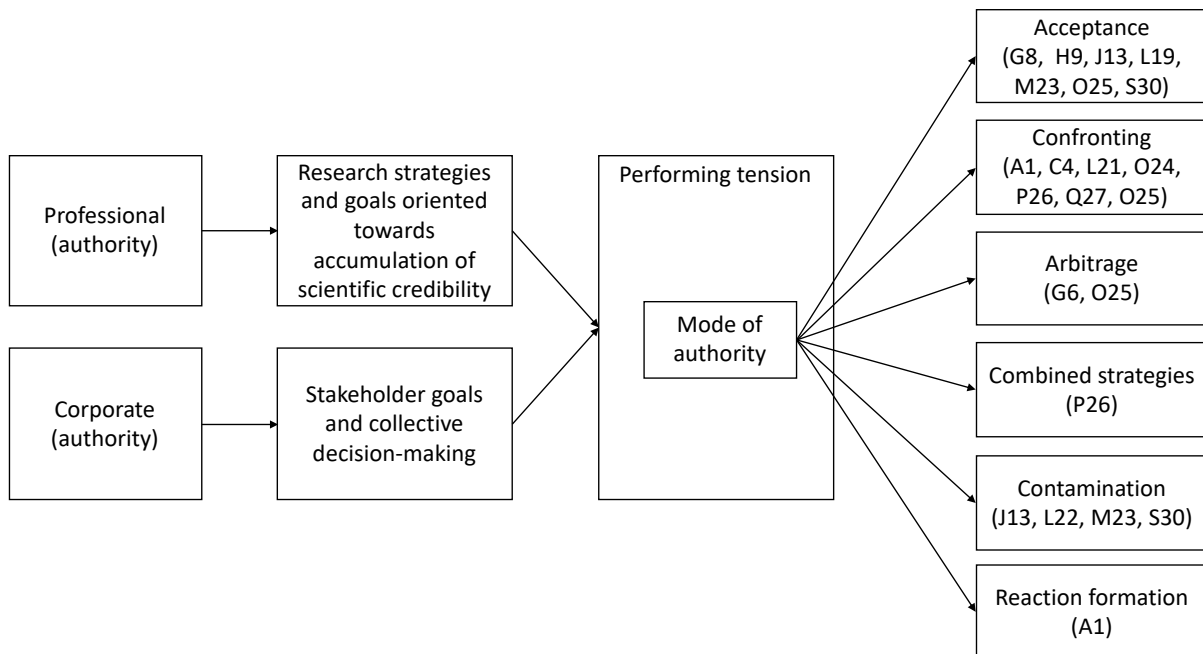


Figure 5-31 Performing tension

The predominant responses to this tension was strategic, which included acceptance (A1) (i.e. privileging of the stakeholder's agenda with the proviso that once these were achieved, the interviewee was free to publish), confrontation (L21) (i.e. a negotiation of goals and strategies until both academics and stakeholders were satisfied), arbitrage (G6) (engagement with a stakeholder's agenda without compromising one's own logic), and combined strategies (acceptance followed by repression once sufficient work had been carried out on behalf of a stakeholder):

"(W)hat I've done, when I've worked with those people, is say 'We will do exactly what you want, but can we use the information that we get to write an academic paper'. So we've been really clear not to do something that muddies the water, absolutely to give them a report in the format that they want with recommendations, but in my mind gathering information." (A1)

"One of the things is that in order to get that commitment is you have to have some sort of agreement with the sort of participants and the people involved in your sort of research. So we tend to do that and we tend to tell people what we are trying to do and what's in it for them both for the individual level and for the organisational one. We were with some people from the European project and we came over and we were arranging for them to speak to a University Careers Service. They wanted to do some work and sort of test the tool, and we said the first question they'll ask is 'What's in it for us?' And you've got to have an answer and they said they are participating in the research. And I said, that's not going to cut it." (L21)

"So my motivations came from being a practitioner so that when I had an opportunity, when I heard there was a political party running for the election and wanting to do something about it, that's where my motivation came from." (G6)

"I mean there is a constant 'Can you do this, can you do that too?'...That was okay. Except that at some point, I would say this is enough now. I've done enough I think to satisfy your side." (P26)

Defensive responses were rarer, but were raised by interviewees. Of these, the most common was contamination (S30) (displacement of academic by corporate logic):

“The demands of the stakeholder, when I was doing consulting work, was centerstage. And I think that was another reason why I didn't feel comfortable trying to publish from it.” (S30)

A single instances of reaction formation (rejection of stakeholder goals) was also noted:

“(B)efore impact was a word that was used, I did a very small study for the pharmaceutical and film industries locally. There was a bit of funding for it and I did that. And I presented it to the local council and business representatives of the community and I realised that all they want is a good news story, and tell you how to mimic that good news story. And that completely puts me off doing anything like that ever again.” (A1)

5.2.32 Collaboration – control

This tension arose as a consequence of contradictions or convergence of ideas of modes of authority between the professional and corporate logics. Mechanisms of reproduction of the professional logic included collegial decision making practices, and those of transformation towards the corporate logic included hierarchal decision making practices and obligation schema of schedule adherence. Fit was identified as the only dimension of this tension, defined as the extent to which actors' abilities match project requirements.

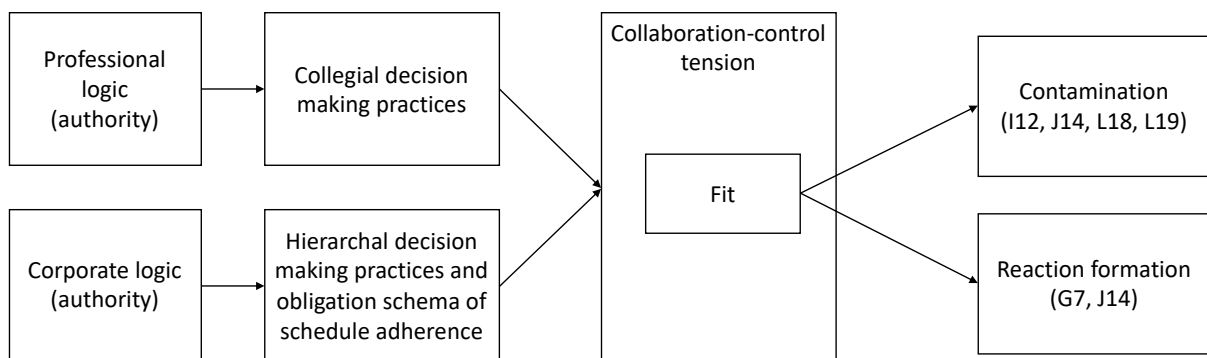


Figure 5-32 Collaboration-control tension

The predominant response was contamination, as interviewees accepted the hierarchal authority of stakeholders in order to complete a project and gain various

forms of scientific credibility (I12). One interviewee described a response of reaction formation, where project members reacted against hierarchal modes of authority (J14):

“(T)he OECD, I mean it was a fascinating, quite scary piece of work, but working at that political level it’s a very different game completely. And you are told in no uncertain terms what your place is and you don’t overstep the mark... Working at that level with those states was fascinating, incredible amount of work, they pay you peanuts but it’s hugely prestigious and status-ey, but really complicated, very difficult, very stressful.” (I12)

“(T)here were quite a significant amount of tensions because the coordinating institution took a very kind of hands on approach, they took on a very micro-managing approach because we had to...ensure that everybody was kind of on the ball and delivering...The micromanaging approach by the coordinator caused problems with some who just didn’t like it and felt there wasn’t any consultation. There were decisions that had to be made on various ways of doing things because there’s not just one methodology for all this. it’s a very complicated mathematical modelling.” (J14)

5.2.33 Summary

Table 5-2 details a summary of the tensions empirically identified in the interviews, and the refinement of these tensions in terms of the dimensions of institutional logics from which these tensions are generated and the dimensions along which the tension is made salient.

Table 5-2 Refinement and characterisation of empirically observed tensions

Tension	Existing knowledge ¹	Characterisation		Refinement
		Logics & logics dimensions	Dimensions of tension	Empirical evidence ²
Neutrality – bias	Inferred in this study	Professional (legitimacy)	Habitus	New
Impartiality – partiality	Conceptual	Professional (legitimacy)/ market (legitimacy)	Links	Confirmatory
Ostensive – performative	Conceptual, empirical	Professional (authority/legitimacy)	Temporal linearity, sequential linearity, division of labour	Additional
Risk – uncertainty	Conceptual, empirical	Professional (authority/identity)	Level of scientific credibility	Additional
Communalism – proprietary	Conceptual, empirical	Professional (legitimacy)/ corporate (legitimacy)	Knowledge dissemination	Additional
Universalism – localism	Conceptual, empirical	Professional (identity)/ community (identity)	Fit	Additional
Disinterestedness – interestedness/ authoritarian	Conceptual, empirical	Professional (authority)/ market (authority)	Fit	Additional
Originality – commissioned	Conceptual, empirical	Professional (identity)/ market (identity)	Directionality	Confirmatory
Organised scepticism – dogmatism/expert	Conceptual	Professional (legitimacy)/ community or corporate (authority)	Knowledge translation	Additional
Disciplinarity – interdisciplinarity	Conceptual, empirical	Professional (legitimacy, identity, authority)/ community or corporate (legitimacy)	Fit	Additional
Convergent – divergent thinking	Conceptual	Market (legitimacy)/ professional (legitimacy)/ professional (legitimacy)	Fit	Confirmatory
Individualism – collectivism	Conceptual, empirical	Professional (authority)/ community (identity, legitimacy) & market (identity, legitimacy)	Fit, sacrifice	Additional

Tension	Existing knowledge¹	Characterisation		Refinement
		Logics & logics dimensions	Dimensions of tension	Empirical evidence²
Breadth – narrowness	Conceptual, empirical	Professional (identity)/ corporate (legitimacy)	Fit	Additional
Craftwork – articulation work	Conceptual, empirical	Professional (identity)/ corporate (identity)	Fit	Additional
Competition – cooperation	Conceptual, empirical	Professional (identity)/ corporate (legitimacy)	Links	Additional
Team obligations – community obligations	Conceptual, empirical	Corporate (legitimacy)/ Professional (identity)	Links	Additional
Freedom – dirigisme	Conceptual, empirical	Professional (identity, legitimacy, authority)/ state (identity, legitimacy, authority)	Fit	Additional
Rigour – relevance	Conceptual, empirical	Professional (legitimacy, identity)	Role of knowledge	Additional
Global – local	Conceptual, empirical	Corporate (legitimacy)/ community (authority)	Fit	Confirmatory
Nation state – competition state	Conceptual	State & corporate (legitimacy)/professional (legitimacy)	Policy diffusion	Confirmatory
Protective state – productive state	Conceptual	State (legitimacy)/ corporate (authority)/professional (legitimacy)	Policy adoption	Confirmatory
Present – future temporal orientation	Conceptual, empirical	Professional (authority)/market or corporate (authority)	Duration, polyphony, temporal punctuation	Additional
Internal – external orientation	Conceptual, empirical	Professional (identity, legitimacy)/ corporate (authority, legitimacy)	Fit	Additional
Centralisation-decentralisation	Conceptual	Professional (authority)/ corporate (authority)	Ft	Confirmatory

Tension	Existing knowledge¹	Characterisation		Refinement
		Logics & logics dimensions	Dimensions of tension	Empirical evidence²
Control – flexibility	Conceptual, empirical	Professional (authority)/ corporate (authority)	Fit, links, sacrifice	Additional
Subjective – instrumental value	Inferred in this study	Professional (legitimacy)	Role of research	New
Performing tension	Conceptual, empirical	Professional (authority)/ corporate (authority)	Mode of authority	Additional
Collaboration – control	Conceptual, empirical	Professional (authority)/ corporate (authority)	Fit	Additional
Knowledge exploration – exploitation	Conceptual, empirical	Professional (legitimacy)/ market (legitimacy)	Knowledge compatibility, knowledge complementarity, trust, tacitness	Additional
Insider – outsider	Conceptual	Professional (legitimacy)/ community (identity)	Links	Confirmatory
Cohesive – diverse relationships	Conceptual, empirical	Community (identity)/ Market (identity)	Links	Additional
Nodal proximity – distance	Inferred in this study	Professional (identity)/ community (identity)	Links	New

¹ See Table 2-1

² Key: “Additional” denotes empirical explorations of this tension exist in the literature. “Confirmatory” denotes empirical confirmation of previously conceptually identified tension, and “New” denotes the first empirical evidence of a new tension.

5.3 Cross-case synthesis

This section presents the patterns of similarities and differences identified within and across the four groups of cases (high impact & outputs, low impact & outputs, high impact & low outputs, low impact & high outputs). In sum, six consistent patterns were observed:

Finding 1: Three novel tensions have been identified

Finding 2: Eight conceptual tensions have been empirically observed

Finding 3: Certain tensions are underpinned by forms of embeddedness not currently associated with the institutional logics perspective

Finding 4: A majority of identified tensions are not associated with an often alluded to professional-market logics dualism, but various configurations of five logics

Finding 5: Certain tensions are associated with one, rather than two or more, societal logics

Finding 6: Typically, strategic responses to certain tensions are generative of impact, although occasionally defensive responses can also be generative.

The following sections discuss these patterns in more detail.

5.3.1 Novel and empirically observed tensions

As shown in Table 5-2, *three new tensions have been identified (Finding 1)* (neutrality-bias, subjective-instrumental value and nodal proximity-distance).

Additionally, *eight conceptual tensions have been empirically observed (Finding 2)* (impartiality-partiality, organised scepticism-dogmatism/expert, convergent-divergent thinking, global-local, nation state-competition state, centralisation-decentralisation, protective state-productive state and insider-outsider). Additional empirical evidence for the twenty one remaining tensions has been provided.

5.3.2 Types of embeddedness underpinning tensions

Most of the tensions identified in Table 5-2 have been conceptualised as being underpinned by the five types of embeddedness [cultural, political, social (structural

and relational), temporal and cognitive] currently associated with the logics perspective, as discussed in Section 2.3.1. *However, certain identified tensions are underpinned by other forms of embeddedness not currently associated with the institutional logics perspective (Finding 3).* Table 5-3 summarises the embeddedness types assigned to each tension, as well as the prevalence of tensions within case groups.

Communalism-proprietary, universalism-localism, organised scepticism-dogmatism/expert, originality-commissioned and disinterestedness-interestedness/authoritarian are regarded as being underpinned by cultural embeddedness on the grounds of Merton's (1973, pp.268–9) claim that such norm-counternorm pairs represent shared academic collective understandings which shape behaviour. Universalism-localism and organised scepticism-dogmatism/expert were almost ubiquitous, arising in multiple cases across all groups. Universalism-localism consistently evoked defensive or mixed responses irrespective of group, suggesting that a partial displacement of universalism by localism within business and management fields is underway, at least among established academics. By contrast, strategic responses elicited by scepticism-dogmatism/expert across all groups in the context of knowledge translation to practitioner cohorts demonstrate that organised scepticism is retained during knowledge translation to practitioner cohorts. However, the defensive responses to this tension exhibited by academics dealing with central HEI administration during the drafting of REF submissions suggest that elements of the corporate logic are being assimilated within academia.

Table 5-3 Cross-group analysis of tensions

Embedded-ness	Tension	Low imp. & output	High imp., low output	High imp. & output	Low imp., high output	Observation
Cultural	Communalism – proprietary	Y	Y	Y	Y	Proprietary partially displacing communalism in contract research across all groups
	Universalism – localism	Y	Y	Y	Y	Localism partially displacing universalism across all groups
	Disinterestedness – interestedness/authoritarian	N	N	N	Y	Interestedness/authoritarian displacing disinterestedness not supported, unclear why this tension arises in just one group
	Originality – commissioned	N	Y	Y	N	Infrequently salient across cases, presumably due to a low priority given to originality by actors with sufficient scientific credibility
	Organised scepticism – dogmatism/expert	Y	Y	Y	Y	Organised scepticism retained in knowledge translation to practitioners but being modified in interactions with HEI administration (all groups)
Cognitive	Ostensive – performative	N	Y	Y	Y	Greater efforts spent crafting impact narratives consistent with an ostensive model of impact may lead to more favourable REF assessments
	Risk – uncertainty	N	Y	Y	Y	Research in low impact & outputs HEIs dependent on practitioner funding, rendering risk less of a concern
Political	Freedom – dirigisme	Y	Y	Y	Y	Dirigisme broadly accepted across all groups in terms of impact legitimacy, subject to disciplinary definitions of science, but is problematically executed in terms of portability and transparency
	Rigour – relevance	Y	Y	Y	Y	Relevance broadly accepted across all groups, subject to disciplinary definitions of science

Embedded-ness	Tension	Low imp. & output	High imp., low output	High imp. & output	Low imp., high output	Observation
	Global – local	Y	Y	N	N	Infrequently salient across cases
	Nation state – competition state	Y	Y	Y	Y	Low impact/high outputs group may have least propensity to influence policy making, while other groups seek out opportunities to influence policy
	Protective state – productive state	Y	Y	Y	Y	All groups predominantly respond strategically to opportunities to influence policy
Structural	Insider – outsider	N	Y	Y	Y	Impact in low impact & outputs group was often achieved through established relationships with local actors, while other groups accessed a range of local, national and global networks
	Cohesive – diverse relationships	Y	Y	Y	N	Global universities within the high impact & outputs group more likely to experience greater demand for practitioner collaboration than more traditional HEIs
	Nodal proximity – distance	Y	Y	Y	Y	General preference for local ties across all groups
Temporal	Present – future temporal orientation	Y	Y	Y	Y	Broad acceptance of Chronos temporal frame across all groups, apart from the high impact/outputs group which engaged in more consultancy within the consensus space than other groups
Relational	Performing tension	Y	Y	Y	Y	Broad acceptance of stakeholder goals and strategies across all groups
	Collaboration – control	N	Y	Y	Y	Acceptance of hierarchal authority of stakeholders, except in low impact/outputs group (reason unclear)

Embedded-ness	Tension	Low imp. & output	High imp., low output	High imp. & output	Low imp., high output	Observation
Moral	Subjective – instrumental value	Y	Y	N	Y	Broad acceptance of both humanistic and utilitarian frames concerning the purpose of research, with the exception of the high impact/outputs group in whose HEIs the socio-critical role of HEIs may be less prominent
Knowledge	Knowledge exploration – exploitation	Y	Y	Y	Y	Acceptance across all groups of various market logics practices, frames, vocabularies in order to facilitate knowledge diffusion
Epistemic	Neutrality – bias	Y	Y	Y	Y	Broad acceptance of the division of labour between qualitative and quantitative academic communities, but challenged by academics holding category memberships where disciplinary contributions were regarded as less important than intrinsic motivations
	Impartiality – partiality	N	Y	N	N	Infrequently salient across cases
Occupational	Disciplinarity – interdisciplinarity	Y	Y	Y	Y	Broad acceptance of both disciplinarity and interdisciplinarity across all groups, though top-down emphasis may be problematic
	Convergent – divergent thinking	Y	N	Y	Y	Infrequently salient across cases
	Competition – cooperation	N	N	Y	Y	High output HEIs may have a greater propensity for cosmopolitan (outside the HEI) rather than local (within the HEI) collaborations
	Team obligations – community obligations	N	N	Y	N	Salient in academics close to retirement

Embedded-ness	Tension	Low imp. & output	High imp., low output	High imp. & output	Low imp., high output	Observation
Occupational	Individualism – collectivism	Y	Y	Y	Y	Broad rejection of research field expectations across all groups, though not for early career researchers
Occupational & organisational	Breadth – narrowness	Y	Y	Y	Y	Broad acceptance of von Humboldt’s model of unity between research (and impact) and teaching across all groups
	Craftwork – articulation work	Y	Y	Y	N	General preference for craftwork expressed by academics, but tension is infrequently salient across cases
Organisational	Internal – external orientation	Y	Y	Y	Y	Broad support across all groups for impact as a third mission of the University, albeit not for all disciplines, and recognition that current organisational practices may be misaligned with this mission
	Centralisation – decentralisation	N	Y	Y	Y	Broad acceptance of centralised structures and decision-making processes across all groups, apart from the low impact/outputs group which lack significant research-oriented resources and structures
	Control – flexibility	Y	Y	Y	Y	Broad acceptance of soft managerial modes of control and rejection of harder control modes across all groups. HEIs with high impact/outputs may expect greater levels of individual academic autonomy than others

Key: Tensions which emerge within case(s) within a group denoted by **Y**. Tensions which do not emerge within case(s) within a group denoted by **N**.

The remaining cultural tensions were observed much less frequently than either universalism-localism or organised scepticism-dogmatism/expert. Communalism-proprietary was observed in the context of contract research across all groups, and the predominantly defensive responses support Etzkowitz's (2011) claim that communalism is partially displaced by an institutional imperative to translate research into economic and social use. By contrast, Etzkowitz' (ibid) claim that the same imperative also leads to a displacement of disinterestedness by interestedness/authoritarian is not supported by the reaction formation responses this tension elicited. This tension arose only within the low impact/high outputs group, and the reason for this is unclear. Finally, the originality-commissioned tension appeared in just two cases, suggesting that this tension was not particularly salient among interviewees, which may be explained by the high levels of scientific credibility held by interviewees rendering originality of low priority.

Two tensions are regarded as being underpinned by cognitive embeddedness. The ostensive-performative tension is so assigned on the grounds of Feldman's (2000) claim that ostensive routines are both cognitive and behavioural and may be devoid of active thinking, while performative routines involve a range of actions, behaviors, thinking, and feeling. This tension arose consistently in both groups of high impact but rarely or not at all in those of low impact. One reason for this may be that the efforts exerted by interviewees and supporting administrators to craft narratives consistent with an ostensive model of impact were successful in case studies being assessed more favourably within REF, as has been claimed elsewhere (Ní Mhurchú et al., 2017). Risk-uncertainty is regarded as a cognitive phenomenon as it concerns series of decisions based on calculations of interest, taken with incomplete information whereby the exercise of economic reasoning is limited. This arose sporadically across all groups except for low impact/low outputs. A possible explanation for this is that research in low impact/low outputs HEIs was often entirely dependent on practitioner funding so that risk associated with such research was less of a concern.

Five tensions are considered to be underpinned by political embeddedness as they concern struggles for power between economic actors. Freedom-dirigisme arose in many cases across all groups, consistent with the notion of a struggle for autonomy between the academic body and the state in which impact is regarded as broadly

legitimate and largely congruent with academics' category membership subject to disciplinary definitions of science, but is problematically executed as a measurement system in terms of portability and transparency. Rigour-relevance, concerning struggles between opposing groups of academics concerning legitimate roles of knowledge, also arose across all groups whereby interviewees recognised the validity of both rigour and relevance, subject to disciplinary definitions of science. The nation state-competition state tension, concerning policy diffusion from other nations to the UK, elicited strategic responses within most groups as academics sought opportunities to influence policy. The exception was the low impact/high outputs group where defensive responses suggested that these HEIs had least political influence. This contrasts with the protective state-productive state tension, concerning government versus actors from which government seeks to extract compliance, which also arose across all groups and typically evoked strategic responses as academics sought to influence policy. Finally, the global-local tension, arising between UK- and non-UK-centric actors, appeared in just two cases, suggesting that this tension is not particularly salient among individual academics.

Structural embeddedness, concerning impersonal configurations of linkages between people or units, underpins three tensions. The insider-outsider tension, concerning whether linkages are allowed to form at network boundaries, was observed in all groups apart from low impact and output. A possible reason for this was that this group involved low research intensity HEIs where impact was often achieved through established relationships with local actors, while other groups accessed a range of local, national and global networks to undertake impactful research. The low impact/high outputs group displayed a high number of strategic responses to this tension, and the reason for this is unclear. The cohesive-diverse relationships tension, concerning preferences for network homogeneity or heterogeneity, appeared in just three cases with a greater preference for heterogeneity observed in the high impact/outputs group than either the low impact/outputs or high impact/low outputs groups. This was rationalised on the basis that this group was made up of global universities (Mohrman, Ma and Baker, 2008) (research intensive, globally-focused, entrepreneurial, collaborative and cross-disciplinary) which are likely to experience greater demand for practitioner collaboration than more traditional HEIs. The nodal proximity-distance tension,

concerning preferences for linkage formation based on various forms of proximity, appeared in all groups with a general preference for geographically close ties.

The present-future temporal orientation tension is regarded as being underpinned by temporal embeddedness as it concerns the social ordering effects of time which shape opportunity and behaviour (Dacin, Ventresca and Beal, 1999). This tension arose consistently across all groups, albeit infrequently within the high impact/high outputs group. One explanation for this observation is that impactful research carried out within this group tended to involve more consultancy and less contract research than other groups, and to occupy the consensus space (competencies to engage in 'blue-sky' thinking, discuss and evaluate proposals for advancement towards a knowledge-based regime) rather than the knowledge space (competencies of knowledge generation, diffusion and use) of the triple helix system (Ranga and Etzkowitz, 2013).

Relational embeddedness, concerning dyadic relationships developed through a history of interactions, underpinned two tensions. Collaboration-control arose across most groups where the hierarchical authority of stakeholders was accepted within cases in order for projects to begin. The exception was the low impact/outputs group, and the reason for this is unclear. The performing tension appeared across all groups with predominantly strategic responses as academics engaged in a variety of strategies to leverage resources from and satisfy demands of stakeholder while ensuring scientific credibility was garnered through collaborations.

However, other tensions identified in this study are underpinned by alternative forms of embeddedness not currently associated with the logics perspective. For example, the subjective-instrumental value tension is regarded as a morally embedded tension as it concerns the role that morally-oriented behaviour plays in research. With the exception of the high impact/outputs group where this tension was not observed, all groups simultaneously held both humanistic and utilitarian frames concerning the purpose of research without necessarily linking this to their own research practice. The reason that this tension did not arise within high impact/outputs group HEIs is unclear, but it suggests that the socio-critical role of academia may be less prominent within global universities than other HEIs.

Knowledge exploration-exploitation is regarded as being underpinned by knowledge embeddedness as it emerges along dimensions of knowledge complementarity, knowledge compatibility, tacitness and trust (Nielsen, 2005), though no evidence of this tension along a dimension of knowledge protectiveness was identified. It was experienced across all groups with all interviewees working to facilitate knowledge diffusion through various channels.

Both the neutrality-bias and impartiality-partiality tensions are regarded as being underpinned by epistemic embeddedness on the grounds of Lacey's claim that neutrality and impartiality are epistemic values (Lacey, 1999, pp.3–5). Neutrality-bias emerged across all groups with mostly splitting responses reifying the division of academic labour between qualitative and quantitative communities. Those few academics which confronted this tension were situated in all groups, with the exception of low impact/outputs, and typically held category memberships where disciplinary contributions were regarded as less important than other intrinsic motivations. Impartiality-partiality was observed in just a single case.

Five tensions are considered to be underpinned by occupational embeddedness as they concern academics' category membership of research field or disciplinary communities, rather than a homogenous academic community. Disciplinarity-interdisciplinarity emerged across all groups and was predominantly responded to strategically as academics engaged in forms of interdisciplinary research, though top-down emphasis on interdisciplinarity was recognised as being potentially problematic. Individualism-collectivism was also experienced across all groups but drew predominantly defensive responses as academics broadly rejected the expectations of research fields in favour of their own interests, though recognising the legitimacy of these expectations for early career researchers. Team obligations-community obligations was observed only in the high impact/outputs group, which may be ascribed to the academics in question being close to retirement rather than this group being more conscious of continuity of research direction than other groups. Competition-cooperation was observed only in the two groups of high outputs, which may be associated with academics in these groups being more involved in cosmopolitan (links outside their home HEI) rather than local (links within their home HEI) collaborations. Convergent-divergent thinking occurred infrequently in all groups apart from high impact/low outputs, and why this was so is unclear.

Organisational embeddedness is regarded as underpinning three tensions on the grounds that these emerge in the course of academics' relational role as faculty members. Centralisation-decentralisation arose across all groups apart from low impact/outputs and always elicited strategic responses as centralised structures and decision-making processes within HEIs were widely accepted by academics. That this tension was not observed within the low impact/outputs group was due to these HEIs being of low research intensity and therefore lacking centralised structures and significant resources dedicated to research. Internal-external orientation was experienced across all groups, with academics broadly supportive of impact as a third mission of the University, albeit not for all disciplines, and recognising that current organisational practices which reward or recruit based on traditional measures of research excellence may be misaligned with this third mission. Control-flexibility arose across all groups with a broad acceptance of soft managerial modes of control and a rejection of harder modes. This tension was observed most frequently within the high impact/outputs group, which may suggest that these HEIs experience greater levels of individual academic autonomy than others.

Two tensions, breadth-narrowness and craftwork-articulation work, are considered to be underpinned by both occupational and organisational embeddedness as they involve conflicts between category membership and role identity. Breadth-narrowness was experienced across all groups, with a predominant acceptance of von Humboldt's model of unity between research (and impact) and teaching. Craftwork-articulation work arose infrequently across all groups except for low impact/high outputs, with a general preference for craftwork being expressed by academics.

5.3.3 Antecedents of impact-related tensions

Thornton and Ocasio (2013, pp.117–118) emphasise that “competing logics are not, by themselves, an explanation for change in institutional logics but an antecedent or a consequence”. Table 5-4 summarises the conflicting, contradicting or converging institutional logics, and the social mechanisms in which they are embedded, which have been conceptualised as antecedents of impact related tensions in Section 5.2.

Two patterns of note are identified. The first is that *a majority of identified tensions are not associated with an often alluded to professional-market logics dualism, but various configurations of five logics (Finding 4)*. The five logics are professional, state, market, community and corporate. Professional-corporate logics dualism or trialisms account for the majority of observed tensions (present-future temporal orientation, communalism-proprietary, breadth-narrowness, craftwork-articulation work, competition-cooperation, team obligations-community obligations, internal-external orientation, centralisation-decentralisation, control-flexibility, performing tension, collaboration-control, disciplinarity-interdisciplinarity, organised scepticism-dogmatism/expert). The professional-market dualism or trialisms account for seven tensions, namely impartiality-partiality, present-future temporal orientation, disinterestedness-interestedness/authoritarian, convergent-divergent thinking, originality-commissioned, knowledge exploration-exploitation and individualism-collectivism. Three tensions are each accounted for by the professional-community dualism (universalism-localism, insider-outsider, nodal proximity-distance) and the professional-state dualism or trialisms (nation state-competition state, protective state-productive state, freedom-dirigisme). Interestingly, five tensions (neutrality-bias, ostensive-performative, risk-uncertainty, rigour-relevance, subjective-instrumental value) are characterised as being underpinned by a professional logic only. This represents *Finding 5, that certain tensions are associated with one, rather than two or more, societal logics*.

Table 5-4 Logics and social mechanisms as antecedents of tensions

Tension	Underpinning logics	Social mechanisms
Impartiality – partiality	Professional	Normative expectations of impartiality
	Market	Leverage
Disinterestedness – interestedness/ authoritarian	Professional	Disinterestedness norm, goals and category membership
	Market	Leverage
Originality – commissioned	Professional	Mode 1 field-level decision-making practices, category membership & causation schema
	Market	Mode 2 obligation schema & category membership
Knowledge exploration – exploitation	Professional	Professional knowledge dissemination practices, vocabularies, schema and frames
	Market	Institutional entrepreneurship, signalling, power systems, sensegiving, structural overlap, causation schema, robust design, vocabulary of practice, sensegiving, Mode 2 research goals, partner selection
Convergent – divergent thinking	Market	Causation schema, goals
	Professional	Field-level practices (research methods accepted within the research field) and cognitive frames
	Professional	Field-level practices (research methods external to the research field), goals
Individualism – collectivism	Market	Entrepreneurship goals, causation schema and Mode 2 category membership
	Professional	Mode 1 field practices and cognitive frame of definition of science
	Community	Goals, causation schema, knowledge dissemination practices and category membership of circuit of knowledge
Communalism – proprietary	Professional	Communalism norm, field-level knowledge dissemination practices
	Corporate	Organisational IPR practices, obligation schema

Tension	Underpinning logics	Social mechanisms
Present – future temporal orientation	Professional	Kairos temporal frame or schema
	Market	Chronos temporal frame or schema, obligation schema of schedule adherence, structural overlap
	Corporate	Chronos temporal frame or schema, obligation schema of schedule adherence, new structure formation
Breadth – narrowness	Professional	Frames & schema of model of teaching/research unity, teacher/student routines
	Corporate	Organisational work allocation and recruitment practices which favour research output
Craftwork-articulation work	Professional	Academic category membership, frames of academic autonomy
	Corporate	Team leader role identity, directive practices, obligation schema
Competition – cooperation	Professional	Academic credit allocation practices
	Corporate	Resource competition, structural overlap
Team obligations – community obligations	Professional	Obligation schema regarding continuity of research
	Corporate	Causation schema concerning resource competition within a field
Internal – external orientation	Professional	Recruitment, reward and promotion practices, decision making and resource allocation emphasising academic excellence
	Corporate	Recruitment, reward and promotion practices, and sensegiving by HEI leaders emphasising impact, decision making, resource allocation and collective organisational identity which view impact positively
Centralisation – decentralisation	Professional	Frames of academic autonomy, collegial decision making practices, collaborative micro-practices
	Corporate	Centralised administrative structures and their decision-making processes

Tension	Underpinning logics	Social mechanisms
Control – flexibility	Professional	Frames of academic autonomy, obligation schema concerning faculty membership, role identity as a faculty member and disciplinary-oriented structures
	Corporate	Directive, reward & performance measurement practices, sensegiving, category labelling, context-oriented structures
Performing tension	Professional	Research strategies and goals oriented towards accumulation of scientific credibility
	Corporate	Stakeholder goals and collective decision-making carried out between researchers and stakeholders
Collaboration – control	Professional	Collegial decision making practices
	Corporate	Hierarchal decision making practices and obligation schema of schedule adherence
Disciplinarity – interdisciplinarity	Professional	Mode 2 category membership, goals and sensemaking
	Professional	Shared expectations for Mode 1 goals, methods, sensemaking & category membership
	Community/ corporate	Field regulatory practices, organisational structures
Organised scepticism – dogmatism/ expert	Professional	Organised scepticism norm, sensemaking, sensegiving, material outputs
	Corporate/ community	Frames
Nation state – competition state	State	Existing national policies
	Corporate	Frames of policy diffusion, policies of other countries
	Professional	Sensemaking, sensegiving, institutional entrepreneurship
Protective state – productive state	State	Embedded liberal cognitive frames and policies
	Corporate	Neoliberal frames and policies, opportunities for evidence within the resource environment
	Professional	Sensemaking, sense giving

Tension	Underpinning logics	Social mechanisms
Freedom – dirigisme	Professional	Autonomy frames, measurement practices, Mode 1 category memberships, permission schema concerning output ownership
	State	Event sequencing within the resource environment, sensegiving by academic leaders and regulators, category membership congruent with impact, field-level regulatory and measurement practices and obligation schema concerning the social contract
Neutrality – bias	Professional	Qualitative vocabularies of practice, collective identities, field practices & cognitive frames (social constructivism)
	Professional	Quantitative vocabularies of practice, collective identities, field practices & cognitive frames (positivism)
Ostensive – performative	Professional	Field & organisational practices of impact measurement
	Professional	Narrative of impact generation
Risk – uncertainty	Professional	Mode 1 goals, causation schema, organisational promotion practices
	Professional	Mode 2 goals and category membership
Rigour – relevance	Professional	Propositional knowledge frames, practices associated with research rigour
	Professional	Procedural knowledge frames, obligation schema & practices associated with relevance
Subjective – instrumental value	Professional	Humanistic knowledge frame
	Professional	Utilitarian knowledge frame, regulatory practices
Global – local	Corporate	Field-level UK-centric practices and international competitive interactions
	Community	Permission schema, power systems

Tension	Underpinning logics	Social mechanisms
Cohesive – diverse relationships	Community	Power systems
	Market	Decision making practices within power systems
Universalism – localism	Professional	Mode 1 category membership, vocabularies of practice and goals, organisational recruitment practices, field-level regulatory practices
	Community	Mode 2 category membership and goals, decision making and reward practices within circuits of knowledge
Insider – outsider	Professional	Academic power systems, causation schema concerning costs & benefits of circuit of knowledge entry
	Community	Circuits of knowledge as power systems, access negotiations
Nodal proximity – distance	Professional	Obligation schema concerning role responsibilities as a faculty member, historical dyadic relations
	Community	Collective local or regional identities, organisational strategies of universities for place-based impact, leverage, convening

5.3.4 Tension responses

Table 5-5 summarises and describes the responses elicited by impact-related tensions as described in Section 5.2. One pattern of note was identified regarding those tensions which may be regarded as generative. Bartunek and Rynes (2014) specified generative tensions associated with the academic-practitioner gap as those which elicit responses leading to positive outcomes for both academics and practitioners. Reflecting the broader perspective of this study on impact, generative tensions are regarded as those which elicit responses that directly facilitate instances of impactful research. Finding 6 of this study was that *typically, strategic responses to certain tensions are generative of impactful research, although occasionally defensive responses can also be generative*. These tensions and responses are described below.

Neutrality-bias was generative in two ways. Confronting this tension involved academics engaging in sensemaking boundary work with other epistemological traditions in order to address topics for which a single epistemology was insufficient to undertake impactful research. Splitting this tension involved reification of the division of academic labour into qualitative and quantitative communities, facilitating impactful collaboration between researchers of similar habitus.

Three responses to communalism-proprietary were generative, each related to stakeholder expectations regarding knowledge dissemination strategies as a precondition for commencing impactful research. Acceptance involved negotiation between researcher and stakeholder to agree a mutually beneficial strategy. Conflict avoidance involved acceptance of stakeholder demands, though this limited subsequent knowledge spillovers. Contamination involved accepting the principle of open science as a precondition for public funding.

Two responses to universalism-localism were generative. Confrontation involved engaging in knowledge translation activities following research to derive impact. Contamination generated impact through undertaking research congruent with a practitioners' agenda regardless of whether academic outputs would be created, such as in contract research or knowledge transfer partnerships.

Table 5-5 Tensions responses

Tension	Response	Description	Generative?	Cases
Neutrality-bias	Confronting	Engagement in sensemaking boundary work with other epistemological traditions	Yes	F5, G8, I12, L22
	Splitting	Reification of the division between qualitative and quantitative academic labour	Yes	A1, B3, J15, L18, L20, O24, H29, S30
Impartiality-partiality	Ambivalence	Discomfort caused by peers' divergence from impartiality value	No	J15
Communalism-proprietary	Acceptance	Negotiating dissemination strategies by academic and stakeholder as a precondition of impactful research	Yes	K16, P26
	Contamination	Acceptance of open science preconditions of funding bodies to access funding	Yes	H9
	Reaction formation	Refusing limiting dissemination conditions of stakeholders	No	G7
	Conflict avoidance	Adherence to dissemination conditions of stakeholders as a precondition of impactful research	Yes	F5, O25, S30
Universalism-localism	Confronting	Conducting research followed by subsequent knowledge translation activities to derive impact	Yes	F5, G6, G7, M23, O24, H29
	Contamination	Undertaking research congruent with a practitioners' agenda regardless of whether academic outputs are created	Yes	C4, F5, G6, G8, G10, H11, I12, J13, J15, K16, L19, L22, O25, P26, Q27, R28, S30
	Repression	Preference for Mode 1 knowledge creation	No	G10, H11, L18, O24, O25, H29, S30
	Splitting	Recognising the validity Mode 1 research for certain disciplines more than others	No	I12, J14, L20, L22

Tension	Response	Description	Generative?	Cases
Disinterestedness – interestedness/ authoritarian	Reaction formation	Expressing distaste regarding peers obtaining financial, emotional or social rewards	No	C4, L21, O24
Originality-commissioned	Ambivalence	Recognising the importance of impact but noting its detrimental effect on directionality	No	J14
	Confrontation	Identifying an original contribution within a commissioned piece of research	Yes	G7
	Reaction formation	Criticising Mode 1 directionality decision-making practices	No	G10
Organised scepticism-dogmatism/expert	Confronting	Engaging in sensemaking followed by knowledge translation to correct practitioners misconceptions	Yes	A1, C4, G6, L18, L19, L22, O24, O25
	Contamination	Engaging in additional impact evidence gathering to satisfy preferences for quantitative evidence	No	H9, H11, J13, K16, P26, Q27
Ostensive-performative	Drive towards consistency	Crafting narratives consistent with an ostensive model of impact to attain more favourable REF assessment	No	G6, G10, H11
	Ambivalence	Attributing significance to their own contribution to impact while recognising the contributions of others academic researchers during assessment	No	G7, H11, J14, J15, H29
	Confronting	Engaging in framing contests to challenge assumptions of linearity among stakeholders	No	H9
	Reaction formation	Stressing the collective and non-linear nature of impact during assessment	No	G6, H9, P26
Risk-uncertainty	Confronting	Privileging Mode 2 category memberships and the choice of research goals relevant to practitioners	Yes	L20, P26
	Risk aversion	Avoiding, or advising others to avoid, Mode 2 research	No	H9, S30

Tension	Response	Description	Generative?	Cases
Freedom-dirigisme	Acceptance	Acceptance of impact being framed as a legitimate mission of academia	No	B2, B3, F5, H9, G10, H11, I12, J14, J15, K16, L17, L19, L20, L21, O25, R28
	Ambivalence	Impact regarded as legitimate but difficult for the business school or certain disciplines	No	F5, J15
	Splitting	Preference for past over present research environments	No	G8, G10, I12, L20
	Reaction formation	Holding category memberships which do not encompass impact and regarding research outputs as owned by academics	No	A1, B2, C4, F5, J14
	Drive to consistency	Preference for measurement of research excellence	No	F5
	Projection	Portability regarded an initiative of HEI leaders	No	F5, L17
Rigour-relevance	Acceptance	Recognition of the validity of rigour and relevance	No	F5, G7, G10, H11, J13, L22, H29
	Splitting	Recognition of the validity of separating researchers into those who make conceptual or theoretical contributions and those whose research may have practical applications	No	F5, H11, L18, L19, O24, R28 H29
	Contamination	Challenging the legitimacy of propositional knowledge in practitioner contexts	No	G10
Global-local	Confronting	Culturally sensitive application of UK-centric practices in other national contexts	Yes	B3, J13

Tension	Response	Description	Generative?	Cases
Nation state-competition state	Arbitrage	Engaging in leverage to persuade policy makers to pursue specific courses of action during evidence-based policy diffusion	Yes	G10, I12, J14, K16, L18, R28
	Reaction formation	Criticising non evidence-based policy diffusion	No	L20, L21, O25
Protective state-productive state	Confronting	Influencing policy adoption through sensemaking and sensegiving	Yes	B3, G6, I12, L20, L22, R28
	Reaction formation	Criticising non evidence-based policy making	No	J14, L20, O25
Insider-outsider	Acceptance	Concluding that potential benefits of engaging with practitioner networks outweigh the costs of link formation	Yes	B2, C4, H11, J14, J15, L18, L19, L21, L22, O25
	Risk avoidance	Avoiding cost of pursuing access to practitioner networks	No	C4, J14
Cohesive-diverse relationships	Risk avoidance	Preference for working within networks with homogenous rather than heterogenous ties	Yes	J14, K16, Q27
	Combined strategies	Preference for working within networks with a mixture of homogenous and heterogenous ties	Yes	G7, G10
Nodal proximity-distance	Repression	Establishing collaborative links with geographically proximate collaborating practitioners	Yes	B3, H9, L18, R28
	Arbitrage	Establishing collaborative links with geographically distant collaborating practitioners	Yes	O25, S30
Collaboration-control	Contamination	Accepting the hierarchal authority of stakeholders in order to undertake a research project	Yes	I12, J14, L18, L19
	Reaction formation	Reaction against hierarchal authority of stakeholders	No	G7, J14

Tension	Response	Description	Generative?	Cases
Performing tension	Acceptance	Privileging of stakeholder's agenda with the proviso that subsequent academic publishing is allowed	Yes	G8, H9, J13, L19, M23, O25, S30
	Confronting	Negotiation of goals and strategies to the satisfaction of both academics and stakeholders	Yes	A1, C4, L21, O24, P26, Q27, O25
	Arbitrage	Engagement with a stakeholder's agenda because of its congruence with one's own agenda	Yes	G6, O25
	Combined strategies	Conducting research on behalf of a stakeholder but refusing subsequent requests once sufficient work has been carried out	Yes	P26
	Reaction formation	Rejection of stakeholder goals	No	A1
	Contamination	Adoption of the goals and strategies of stakeholders	Yes	J13, L22, M23, S30
Competition-cooperation	Combined strategy	Splitting (dividing a project into discrete workstreams to separate conflicting researchers) and confronting (discussing the conflict to create a more accommodating understanding of issues)	Yes	L21
	Splitting	Not collaborating beyond a "core group" of researchers to limit competition	No	H9
	Ambivalence	Awareness that one's behaviour may be interpreted as competitive by others	No	L22
	Projecting	Ascribing difficulties in collaboration to others	No	L19
	Repressing	Competing with other institutions in recruitment of staff and students	No	H9

Tension	Response	Description	Generative?	Cases
Present-future temporal orientation	Repression	Repressing a preference for curiosity-driven sensemaking in favour of knowledge creation targeted at specific stakeholder goals	Yes	J14, K16, O24, O25
	Regression	Losing motivation during a prolonged project and reverting to more curiosity-driven research	No	J14
	Projection	Criticism of academic leaders who required impact generation without taking account of an actor's other duties	No	F5, H11, J14, J15, O24
	Acceptance	Waiting until a stakeholder, distracted by the tension, is in a position to collaborate	Yes	I12, J14, M23
	Transcendence	Anticipating the "political zeitgeist" and engaging in leverage to mobilise support and acceptance among stakeholders before they become distracted by the tension	Yes	G7, L20, L22, R28
	Splitting	Spinning out an academic project team as a new venture	Yes	B3, G10, I12
Subjective-instrumental value	Acceptance	Accepting the legitimacy of both humanistic and utilitarian knowledge	No	B2, C4, F5, J15, L18, O24, O25, P26
	Ambivalence	Recognising that impact measurement acted as a mechanism of institutional transformation towards utilitarianism	No	A1
Convergent-divergent thinking	Contamination	Pursuing impactful research due to perceived lack of fruitfulness of Mode 1 research within a field	Yes	H11, H29
	Confronting	Adoption of new research methodologies which are eventually accepted within a field	Yes	G8, L18, R28

Tension	Response	Description	Generative?	Cases
Knowledge exploration-exploitation	Contamination	Engaging in institutional entrepreneurship to have academic skills and resources accessed by practitioners	Yes	C4, G8, G10, H11, L17, L18, L19, L20, L21, L22, M23, O24, O25, P26, Q27, R28, S30
	Arbitrage	Voluntarily disclosing knowledge to less informed economic agents to convince them of academic attributes	Yes	F5, G6, G7, H9, I12, L17, L18, L19, L20, L22, M23, O24, P26, Q27, R28
	Confronting	Developing knowledge compatibility between academic and collaborating practitioners Engaging in knowledge translation	Yes	F5, G6, G7, G8, H9, H11, J13, J14, L17, L18, L19, L20, L21, L22, M23, O24, O25, P26, Q27
	Acceptance	Establishing levels of competence or contractual trust to ensure commissions from practitioners	Yes	A1, G6, H9, I12, L18, O24, Q27, H29
	Ambivalence	Post hoc acceptance that collaborations would have been improved with greater knowledge compatibility between partners	No	J14, J15, L18, Q27, H29
Individualism-collectivism	Projection	Criticising the narrow focus of a field's journals	No	F5, G8, G10, H11, I12, J15, L18, L20, L21, O24, H29
	Combined strategies	Choosing alternative dissemination channels to reach different audiences	Yes	F5, L20, O24
	Repression	Adhering to field expectations and practices	No	G10, B3
	Reaction formation	Refusing to publish in academic journals while seeking alternative ways to disseminate knowledge	Yes	G10, H11, I12
	Ambivalence	Recognising the "trade-off" between individual academic autonomy and attaining status within a field	No	G8, G10, L22, P26

Tension	Response	Description	Generative?	Cases
Disciplinary- interdisciplinarity	Acceptance	Incorporating interdisciplinarity into one's research practice	Yes	B3, F5, G7, G8, H9, G10, I12, J15, K16, L17, L21, M23, O25, P26, R28, S30
	Regression	Retrenchment to disciplinary boundaries	No	B3, H11
	Confrontation	Acting as an integrator to stop retrenchment to disciplinary boundaries by other researchers	Yes	G8, G10
	Risk avoidance	Failing to submit interdisciplinary research for assessment	No	H9, M23
	Ambivalence	Accepting the legitimacy of interdisciplinarity measurement in principle but questioning the practice	No	G8, H11
	Repression	Undertaking disciplinary research which facilitates impactful research collaboration between academics with similar goals	Yes	B3, L20, L22, P26, Q27
Breadth- narrowness	Splitting	Acceptance of separate teaching and research contracts in order to maximise research effort	No	F5, J14
	Repression	Preference for research/impact-informed teaching to engage and involve students in impact	No	C4, F5, G6, G7, H9, G10, H11, I12, J13, J14, J15, L17, L20, M23, P26, Q27, S30
	Avoiding conflict	Making trade-offs between teaching and impact demands	No	J13
	Driving to consistency	Making only sporadic updates of teaching syllabus	No	M23, O25
	Contamination	Acceptance of the need to employ academic stars who do not contribute to student development	No	J15, H29

Tension	Response	Description	Generative?	Cases
Team obligations- community obligations	Acceptance	Succession planning as a means both to continue a research direction and to develop a successor	No	G8, G10
Craftwork- articulation work	Contamination	Directing research colleagues contrary to the tenets of individual academic autonomy	Yes	G10
	Reaction formation	Aversion to articulation work associated with a project	No	B3, G10, J15, K16
Internal-external orientation	Acceptance	Acceptance of organisational emphasis on impact as legitimate	No	F5, G8, G10, H11, I12, J13, L17, L18, L19, L21, L22, M23, P26, Q27, S30
	Ambivalence	Personally supportive of impact as a third mission but aware of associated negative effects	No	G7, H11, I12, J15, K16, L20, P26, S30
	Repression	Acceptance of the privileging of teaching over research or impact	No	B2, K16, O25, Q27, S30
	Driving to consistency	Acceptance of organisational emphasis on traditional measures of research quality	No	F5, H9, H11, J13, L20, L22, O24, O25, S30
	Splitting	Acceptance of organisational emphasis for impact placed only on certain cohorts of faculty	No	B3, C4, F5, H9, G10, H11, L17, L19, L20, L22, P26, R28, H29, S30

Tension	Response	Description	Generative?	Cases
Centralisation-decentralisation	Acceptance	Cooperating with centralised organisational structures designed to develop and support links between the university and external actors	No	B2, G6, H9, G10, H11, J13, L17, L20, L22, S30
	Confronting	Socially constructing a new understanding with central support structures to facilitate external collaboration	No	G10, P26
Control-flexibility	Acceptance	Acceptance of soft managerial modes of control within HEIs emphasising impact	No	B3, G6, G8, H9, G10, H11, L17, O27, H29
	Reaction formation	Rejection of hard managerial modes of control	No	F5, J14
	Conflict avoidance	Actors leaving the HEI to continue work elsewhere	No	G6, L17, L19
	Regression	Unsuccessful efforts to incorporate external elements into an organisational whole	No	B3, L17, L20
	Confronting	Challenging existing practices or structures within a HEI which de-emphasise impact or collaboration	No	I12, L19

Confronting the originality-commissioned tension involved publishing an academic paper concerning an original contribution identified during a commissioned piece of research.

Confronting the organised scepticism-dogmatism/expert tension involved engagement in sensemaking followed by knowledge translation to practitioners in order to address incorrect frames concerning how and why a particular phenomenon worked. This response generated impact when practitioners were influenced by academics and modified their behaviour.

Confronting the risk-uncertainty tension generated impact through the privileging of Mode 2 category memberships and the choice of research goals relevant to practitioners.

Accepting the disciplinarity-interdisciplinarity tension enabled academics to incorporate interdisciplinarity into their own research practice, which facilitated impact by accessing diverse knowledge bases and methodologies to more comprehensively tackle contextual problems. Confronting this tension involved acting as integrator to stop the retrenchment of others to disciplinary boundaries, while repression enabled academics to conduct good quality disciplinary research from which impact was derived.

Confronting the convergent-divergent thinking tension involved the adoption of new research methodologies offering alternative perspectives on a phenomenon that subsequently influenced practitioners, and which eventually become more broadly accepted within a field. A contamination response involved the intentional pursuit of impactful research due to a perceived lack of fruitfulness of a field's Mode 1 research.

Two responses to the individualism-collectivism tension were generative. Reaction formation involved seeking alternatives to academic journals as channels of knowledge dissemination which generated impact when these outputs influenced or were used by practitioners. Combined strategies, such as compartmentalisation, enabled academics to produce both Modes 1 and 2 research outputs, allowing the academic to gain scientific credibility and to derive impact.

Confronting the global-local tension generated impact through the culturally sensitive application of UK-centric practices in other national contexts.

Avoiding risk in response to the cohesive-diverse relationships tension enabled impact generation by facilitating knowledge diffusion through strong and established ties with practitioners. However, a combined strategies response retained strong ties while also incorporating new actors into a network, enabling impact generation through knowledge dissemination to these actors.

Generative responses to the nodal proximity-distance tension included repression, involving establishing collaborative links with geographically proximate practitioners, and arbitrage, involving establishing collaborative links with geographically distant practitioners.

A response of arbitrage to the nation state-competition state tension involved academics engaging in leverage in order to persuade policy makers to pursue specific courses of action during evidence-based policy formulation.

Confronting the protective state-productive state tension involved engaging in sensemaking and sensegiving to persuade policy makers to modify proposed policy instruments to improve effectiveness.

A contamination response to craftwork-articulation work enabled a principal investigator to adopt a directive managerial style with academic colleagues and thereby meet scheduling expectations of stakeholders during research projects.

Four responses to knowledge exploration-exploitation were generative through facilitating flows of knowledge between academic and practitioners. Contamination involved engaging in institutional entrepreneurship to have academic skills and resources accessed by practitioners. Arbitrage involved signalling, or voluntarily disclosing knowledge to less informed economic agents to convince them of academic attributes. Confronting involved developing knowledge compatibility between academic and collaborating practitioners, and translating knowledge for practitioners through a variety of mechanisms. Acceptance involved academics actively seeking to persuade practitioners to invest competence or contractual trust in them to ensure commissions.

A variety of strategic responses to the performing tension are considered to be generative of impact by meeting a prerequisite of collaborative projects and influencing research direction. Acceptance involved privileging a stakeholder's agenda with the proviso that subsequent academic publishing is allowed. Confronting involved negotiating goals and strategies to the satisfaction of both academics and stakeholders. Arbitrage involved engagement with a stakeholder's agenda because of its congruence with one's own agenda. A combined strategy involved conducting research on behalf of a stakeholder but refusing subsequent requests once sufficient work has been carried out. However, the defensive response of contamination, involving the complete adoption of the goals and strategies of stakeholders was also generative.

A combined strategy response to the competition-cooperation tension, for example by splitting a project into discrete workstreams to separate conflicting researchers and confronting conflicts to create a more accommodating understanding of issues, enabled impactful research to continue without being interrupted by internal squabbling.

Accepting the insider-outsider tension through concluding that potential benefits of engaging with practitioner networks outweigh the costs of link formation enabled academics to engage with practitioners in order to influence research direction.

Repressing the present-future temporal orientation tension privileged knowledge creation targeted at specific stakeholder goals over curiosity-driven sensemaking. Accepting the tension involved postponing work until stakeholders could collaborate. Transcending the tension involved anticipating the "political zeitgeist" and engaging in leverage to mobilise support and acceptance among stakeholders before they become distracted by the tension. Finally, splitting the tension involved spinning out an academic project team as a new venture in order to continue impact generation.

A contamination response to the collaboration-control tension involved accepting the hierarchal authority of stakeholders as a prerequisite for undertaking a research project.

For convenience, Table 5-6 summarises the generative tensions and responses described above. These were further classified using the Smith and Lewis (2011)

framework of paradoxical tension categories as follows. The performing category, which stems from multiple stakeholders whose differing demands result in competing strategies and goals, includes the performing tension. The performing/organising category, involving means-ends tensions, includes collaboration-control. The learning/organising category, involving tensions between the stability and efficiency offered by, versus the dynamic, flexible, and agile outcomes enabled by routines and capabilities, includes nation state-competition state, protective state-productive state, present-future temporal orientation, knowledge exploration-exploitation, disciplinarity-interdisciplinarity, neutrality-bias and convergent-divergent thinking. Belonging/organising involves tensions between individuality vs. collective action, including communalism-proprietary, insider-outsider, cohesive-diverse relationships, nodal proximity-distance and individualism-collectivism. Performing/belonging, involving clashes between identification and goals as actors negotiate individual identities with social and occupational demands, includes universalism-localism, risk-uncertainty, competition-cooperation, originality-commissioned, global-local and craftwork-articulation work. The learning category, involving efforts to adjust, renew, change and innovate which foster tensions between building upon and destroying the past to create the future, includes organised scepticism-dogmatism/expert.

Table 5-6 Categories of generative tensions and responses

Tension category	Tension	Generative response	
		Strategic responses	Defensive responses
Learning	Organised scepticism-dogmatism/expert	Confronting	-
Performing	Performing tension	Acceptance, confronting, arbitrage, combined strategies	Contamination
Belonging/organising	Communalism-proprietary	Acceptance	Contamination, conflict avoidance
	Insider-outsider	Acceptance	-
	Cohesive-diverse relationships	Combined strategies	Risk avoidance
	Nodal proximity-distance	Arbitrage	Repression
	Individualism-collectivism	Combined strategies	Reaction formation
Performing/belonging	Originality-commissioned	Confronting	-
	Universalism-localism	Confronting	Contamination
	Risk-uncertainty	Confronting	-
	Competition-cooperation	Combined strategies	-
	Craftwork-articulation work	Contamination	-
	Global-local	Confronting	-

Tension category	Tension	<u>Generative response</u>	
		Strategic responses	Defensive responses
Performing/organising	Collaboration-control	-	Contamination
Learning/organising	Nation state-competition state	Arbitrage	-
	Protective state-productive state	Confronting	-
	Present-future temporal orientation	Acceptance, transcendence	Repression, splitting
	Knowledge exploration-exploitation	Arbitrage, confronting, acceptance	Contamination
	Neutrality-bias	Confronting	Splitting
	Disciplinarity-interdisciplinarity	Acceptance, confrontation	Repression
	Convergent-divergent thinking	Confronting	Contamination

5.4 Summary

This chapter began by presenting case narratives, followed by a discussion of impact-related tensions identified within cases and finally the identification of six key cross-case patterns (Table 5-7). In the next chapter, these patterns are discussed with regards to their implications for theory and practice.

Table 5-7 Cross-case patterns

No.	Identified pattern
1	Three novel tensions have been identified
2	Eight conceptual tensions have been empirically observed
3	Certain tensions are underpinned by forms of embeddedness not currently associated with the institutional logics perspective
4	A majority of identified tensions are not associated with an often alluded to professional-market logics dualism, but various configurations of five logics
5	Certain tensions are associated with one, rather than two or more, societal logics
6	Typically, strategic responses to certain tensions are generative of impactful research, although occasionally defensive responses can also be generative

6 DISCUSSION AND CONTRIBUTIONS

This chapter hosts a discussion of the significance of research findings identified in Chapter 5 in relation to the current state of theory as elaborated in Chapter 2. It incorporates the six key patterns from the data (Table 5-7), presenting them as a starting point for further theory development. In total, three contributions to theoretical knowledge are identified, as well as one contribution to practical knowledge (Table 6-1).

Table 6-1 Contributions to knowledge

Domain of contributions	Extent of contributions		Literature broadened or extended
	What has been found which is brand new	What has been developed	
Theoretical knowledge	Contribution 1: Empirical confirmation of a typology of individual-level impact-related tensions, within which three novel tensions are identified		Merton, 1973, Ziman, 1996, Hackett, 1990, 2005
		Contribution 2: Development of the logics perspective through revelation of new types of embeddedness as theories of change	Granqvist and Gustafsson, 2016; Thornton, Ocasio and Lounsbury, 2012, pp.79–80
	Contribution 3: Development of the logics perspective through revelation of “institutional monism” as a new source of conflict arising within a single institutional order		Jarzabkowski, Matthiesen and van de Ven, 2009, pp.284–285; Thornton, Ocasio and Lounsbury, 2012, p.142
Knowledge of practice		Contribution 4: Barriers to research effectiveness should be responded to strategically rather than defensively in order to maximise impact generation	Response to Nurse (2015)

6.1 Institutional logics as antecedents of impact-related tensions

Building on the institutional logics perspective (Thornton, Ocasio and Lounsbury, 2012), the previous chapter demonstrated that logics, and their representations within various social mechanisms, acted as antecedents for a range of impact-related tensions which in turn elicited various responses at individual level. Many of these tensions were salient across all HEI groups explored in this study, while the salience of others was mediated by the type of HEI in question.

These findings are consolidated within a typology of impact-related tensions (Table 6-2), which includes dimensions of each tension, underlying theories of action (type of embeddedness), antecedents (conflicting or converging institutional logics), moderators and the responses exhibited at individual level. This typology addresses the study's primary purpose to identify why conflicting, contradicting or converging institutional logics give rise to impact-related tensions at an individual level, and how academics respond.

The typology responds to Bartunek and Rynes' (2014) observation of a paucity of research concerning academic-practitioner tensions, and by extension impact-related tensions. Its intended utility lies in sharpening the focus of research concerning academic behaviour in impact contexts by addressing a lack of conceptual clarity associated with some prior work. Two instances are used to illustrate this point. The first is the call for a rigorous and systematic research program investigating how the results of scientific research are utilised in management practice to replace the "ideological, uncritical and unscientific debate" within a "programmatic literature" (Kieser, Nicolai and Seidl, 2015). The typology reveals a misunderstanding concerning the nature of the rigour-relevance tension. While this tension is formally conceptualised as political, concerning competing rhetorics (Knights, 2008) and frames (Tranfield and Starkey, 1998) legitimising management research within academia, the programmatic literature focuses on dyadic relational issues, suggesting particular ways of dealing with practitioners' perceptions of lack of practical relevance. The typology offers a guide for distinguishing specific tensions, such as knowledge exploration-exploitation or the performing tension which the programmatic literature implicitly and erroneously addresses, from rigour-relevance.

Table 6-2 Typology of impact-related tensions in business and management fields

Embeddedness	Tension	Logics	Dimensions	Responses	Moderators
Cultural	Communalism – proprietary	Professional/ corporate	Knowledge dissemination	Acceptance, conflict avoidance, contamination, reaction formation	Observed in all HEI groups
	Universalism – localism	Professional/ corporate	Fit	Confronting, contamination, repression, splitting	Observed in all HEI groups
	Disinterestedness – interestedness/ authoritarian	Professional/ market	Fit	Reaction formation	Observed in low impact/high output HEIs only (reason unknown)
	Originality – commissioned	Professional/ market	Directionality	Ambivalence, confronting, reaction formation	Insufficiently salient across cases
	Organised scepticism – dogmatism/expert	Professional/ corporate or community	Knowledge translation	Confronting, contamination	Observed in all HEI groups
Cognitive	Ostensive – performative	Professional/ professional	Temporal linearity, sequential linearity, division of labour	Confronting, ambivalence, drive towards consistency, reaction formation	Observed in all groups except low impact/output HEIs, which lack central administration support for REF submission
	Risk – uncertainty	Professional/ professional	Level of scientific credibility	Confronting, risk aversion	Observed in all groups except low impact/output HEIs where research is typically more dependent on practitioner funding
Political	Freedom – dirigisme	Professional/ state	Fit	Acceptance, ambivalence, splitting, reaction formation, drive to consistency, projection	Observed in all HEI groups

Embeddedness	Tension	Logics	Dimensions	Responses	Moderators
Political	Rigour – relevance	Professional/ professional	Role of knowledge	Acceptance, splitting, contamination	Observed in all HEI groups
	Global – local	Corporate/ community	Fit	Confronting	Infrequently salient across cases
	Nation state – competition state	State/corporate/ professional	Policy diffusion	Arbitrage, reaction formation	Observed in all HEI groups
	Protective state – productive state	State/corporate/ professional	Policy adoption	Confronting, reaction formation	Observed in all HEI groups
Structural	Insider – outsider	Professional/ community	Links	Acceptance, risk avoidance	Observed in all groups except low impact/output HEIs where impact is primarily derived through contract research rather than through networks
	Cohesive – diverse relationships	Community/ market	Links	Risk avoidance, combined strategies	Observed infrequently in all groups except low impact/ high output HEIs, and potentially most salient within the high impact/outputs group as global universities are more likely to experience greater demand for practitioner collaboration than other HEIs
	Nodal proximity – distance	Professional/ community	Links	Repression, arbitrage	Observed in all HEI groups
Relational	Performing tension	Professional/ corporate	Mode of authority	Acceptance, confronting, arbitrage, combined strategies, contamination, reaction formation	Observed in all HEI groups
	Collaboration – control	Professional/ corporate	Fit	Contamination, reaction formation	Observed in all groups except low impact/outputs HEIs (reason unclear)

Embeddedness	Tension	Logics	Dimensions	Responses	Moderators
Temporal	Present – future temporal orientation	Professional/ market/ corporate	Duration, polyphony, temporal punctuation	Repression, acceptance, regression, projection, transcendence, splitting	Observed in all HEI groups
Knowledge	Knowledge exploration – exploitation	Professional/ market	Knowledge complementarity, knowledge compatibility, tacitness, trust	Contamination, acceptance, confronting, arbitrage, ambivalence, confronting	Observed in all HEI groups
Moral	Subjective – instrumental value	Professional/ professional	Role of research	Acceptance, ambivalence	Observed in all groups except high impact/outputs HEIs where the socio-critical role of HEIs may be less prominent
Epistemic	Neutrality – bias	Professional/ professional	Habitus	Confronting, splitting	Observed in all HEI groups
	Impartiality – partiality	Professional/ market	Links	Ambivalence	Infrequently salient across cases
Occupational & organisational	Breadth – narrowness	Professional/ corporate	Fit	Splitting, repression, conflict avoidance, drive to consistency, contamination	Observed in all HEI groups
	Craftwork – articulation work	Professional/ corporate	Fit	Contamination, reaction formation	Infrequently salient across cases

Embeddedness	Tension	Logics	Dimensions	Responses	Moderators
Occupational	Disciplinarity – interdisciplinarity	Professional/ corporate or community	Fit	Acceptance, confronting, repression, regression, risk avoidance, ambivalence	Observed in all HEI groups
	Convergent – divergent thinking	Market/ professional/ professional	Fit	Contamination, confronting	Infrequently salient across cases
	Competition – cooperation	Professional/ corporate	Links	Combined responses, splitting, ambivalence, projecting, repression	Observed only in high output HEIs which may have a greater propensity for cosmopolitan rather than local collaborations
	Team obligations – community obligations	Professional/ corporate	Links	Acceptance	Observed only for academics close to retirement
	Individualism – collectivism	Market/ professional/ community	Fit, sacrifice	Projection, combined strategies, repression, ambivalence, reaction formation	Observed in all HEI groups
Organisational	Internal – external orientation	Professional/ corporate	Fit	Acceptance, ambivalence, drive to consistency, splitting, repression	Observed in all HEI groups
	Centralisation – decentralisation	Professional/ corporate	Fit	Acceptance, confronting	Observed in all groups except low impact/outputs HEIs which lack significant research-oriented resources and support structures
	Control – flexibility	Professional/ corporate	Fit	Acceptance, confronting, reaction formation, conflict avoidance, regression	Observed in all HEI groups

The second instance concerns a lack of conceptual clarity concerning the autonomy-heteronomy tension. The definition of this tension used here, the extent to which external influence upon academic action is permissible, is based on Gauchat and Andrews' (2018) definition of heteronomous authority as "a compatibility with dominant interests in economic and political centers of power". This in turn is founded upon Bourdieu's conceptualisation (1983, pp.326–327) of heteronomy as "aris(ing) from demand which may take the form of personal commission (formulated by a patron)...or of the sanction of an autonomous market, which may be anticipated or ignored". This suggests that autonomy-heteronomy operates over at least two levels, the dyadic relationship between an academic and the commissioner of a piece of research, and field level where peer expectations of autonomy may act as a sanction. Explorations of the tension have been made separately at either level (Amsler, 2011; Colley, 2014; Smith, Ward and House, 2011). However, at a field level, autonomy-heteronomy appears indistinguishable from the originality-commissioned or disinterestedness-interestedness/authoritarian tensions, and at dyadic level, from the performing tension, collaboration-control or past-future temporal orientation. Therefore, it is argued here that the autonomy-heteronomy tension should be replaced by one or more of these tensions as objects of further study.

In addition to its use in sharpening the focus of future research, the typology and the key patterns identified in the data may be used to broaden, extend or facilitate convergence in prior work on conceptualisations of knowledge production and diffusion to society, impact-related tensions, institutional logics and generative responses to tensions, as described in the following sections.

6.2 Impactful research

The empirical findings of Chapter 5 are synthesised into a novel analytical framework of "impactful research" within business and management fields (Figure 6-1). For the purposes of this study, impactful research is defined as academic research which underpins impact. This framework includes micro (individual and cognitive factors, team/project factors), meso (organisational) and macro (institutional, cultural, structural, relational, temporal, moral, epistemic, political, knowledge and

disciplinary/field factors). The purpose of this framework is twofold. First, it addresses aspects of institutional change which are typically neglected in prior work, such as cultural-cognitive (Lam, 2010) and temporal (MacIntosh et al., 2017) aspects. Second, it facilitates convergence between various streams of literature concerning conceptualisations of the production and diffusion of academic knowledge to society. Both the differences and overlaps between impactful research and these other conceptualisations are outlined in Table 6-3 and described below.

Mode 1 knowledge production (Gibbons et al., 1994), characterised as disciplinary, hierarchal and homogenous, describes a traditional “ivory tower” model of academia isolated from society. Both knowledge commercialisation and knowledge valorisation retain this separation from society but adopt a single bottom line focus on economic benefits of research (Baycan and Stough, 2012). Frontier research (Flink and Kaldewey, 2018) also maintains societal isolation but adopts a double bottom line approach of economic and social benefits of research. Both Mode 2 knowledge production (Gibbons et al., 1994) and academic engagement (Perkmann et al., 2013) adopt a larger protected space to include both academic and non-academic research collaborators, but while the focus of the former is on the single bottom line, that of the latter is unspecified. Impactful research differs from all of these in adopting a quadruple bottom line approach to research benefits (Donovan, 2008), which is shared with Mode 3 knowledge production (Huff and Huff, 2001) and grand challenges research (Calvert, 2013). However, while these latter two accept academia’s embeddedness within society in terms of knowledge co-production and problem choice by diverse stakeholders, impactful research is largely indifferent to participation of non-academics as long as impact has reach (spread, breadth of influence or effect of research on relevant constituencies) and significance (intensity of the effect) for society (HEFCE, 2012), and is underpinned by high quality academic research. Indeed, impactful research is concerned only with questions of research effectiveness and not research efficiency or efficacy (Hinrichs-Krapels and Grant, 2016).

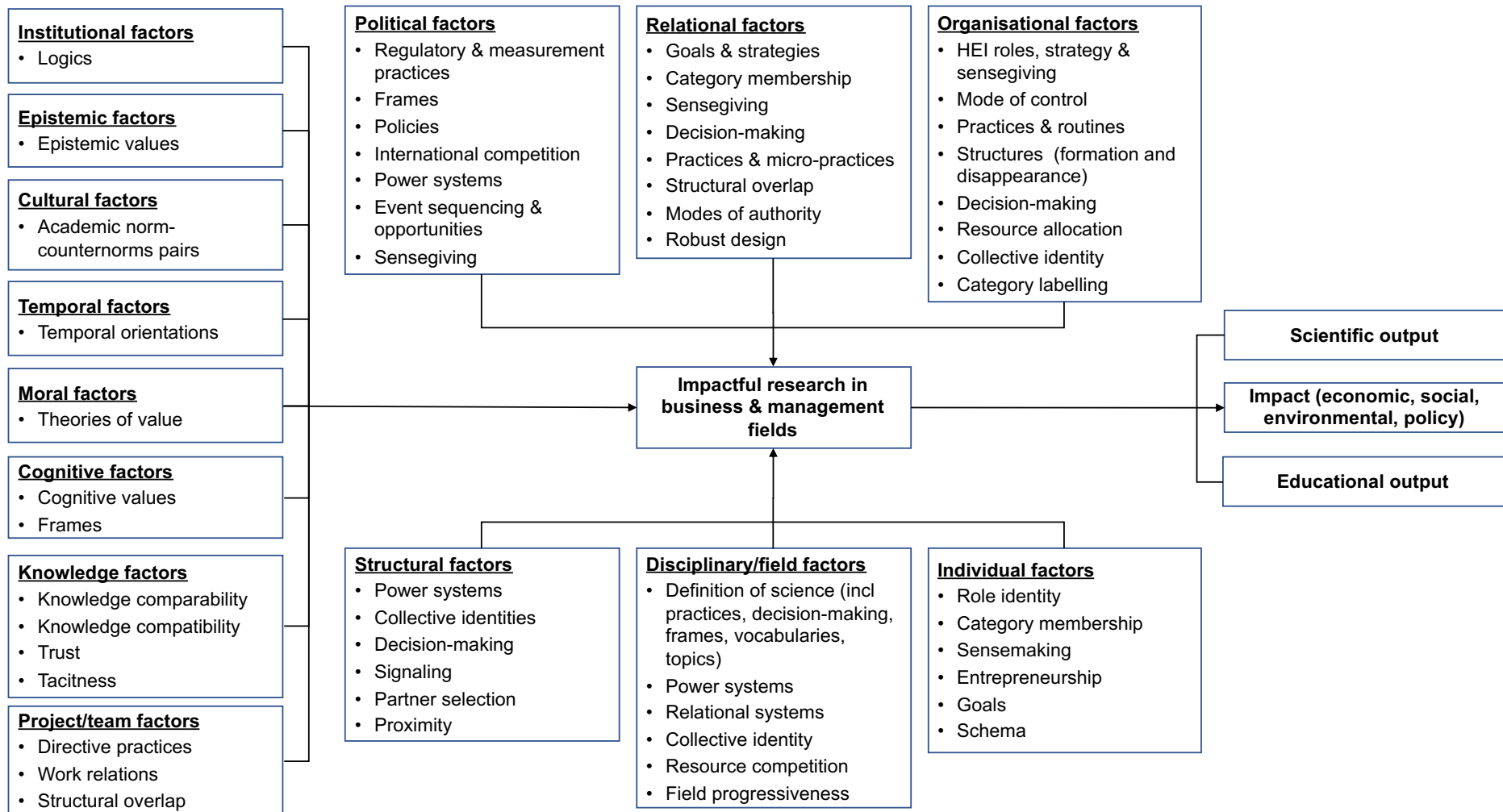


Figure 6-1 Analytical framework for impactful research in business and management fields

Table 6-3 Conceptualisations of the production and diffusion of academic knowledge to society

Conceptualisation	Definition	Approach	Trigger	Relationship of academia to society	Reference
Mode 1	Characterised by problems being set and solved within homogeneous, hierarchal and largely academic communities, with quality control based on peer review	N/A	Theoretic or empirical hole	Isolated	(Gibbons et al., 1994)
Knowledge valorisation	Transfer of knowledge from one party to another for economic benefit	Single bottom line	Commercial imperative	Isolated	(Baycan and Stough, 2012)
Knowledge commercialisation	Process of monetising knowledge, with or without knowledge transfer	Single bottom line	Commercial imperative	Isolated	(Baycan and Stough, 2012)
Academic engagement	Knowledge-related collaboration by academic researchers with non-academic organisations	Not specified	Organisational problem-solving	Isolated apart from non-academic collaborators	(Perkmann et al., 2013)
Mode 2	Knowledge developed in the context of application, involving a broader range of trans-disciplinary perspectives and heterogeneous skills, within non-hierarchical structures and with quality control based on peer review and collaborators views	Single bottom line	Organisational problem-solving	Isolated apart from non-academic collaborators	(Gibbons et al., 1994)
Frontier research	Recognises that basic research is of critical importance to economic and social welfare, is an intrinsically risky venture characterised by an absence of disciplinary boundaries	Double bottom line	National/supra-national competitiveness	Isolated	(Flink and Kaldewey, 2018)

Conceptualisation	Definition	Approach	Trigger	Relationship of academia to society	Reference
Mode 3	Knowledge production is to assure survival and promote the common good, at various levels of social aggregation	Quadruple bottom line	Appreciation and critique of the human condition	Embedded	(Huff and Huff, 2001)
Grand challenges	Bringing together optimal combinations of human minds and scientific institutions around a specific problem or goal to find solutions to the world's biggest problems	Quadruple bottom line	Societal problem-solving	Embedded	(Calvert, 2013)
Impactful research	Academic research which underpins impact	Quadruple bottom line	Reach and significance of societal benefit	Indifferent	This study

6.3 Identification and empirical observation of tensions

Finding 1: Three novel tensions have been identified.

Finding 2: Eight conceptual tensions have been empirically observed.

The study both broadens and extends prior work on tensions experienced within impact contexts. Broadening was achieved by exploring tensions arising not only in the context of economic impact achieved through knowledge commercialisation, but across a broad range of impacts consistent with the quadruple bottom line definition used within REF2014. Further broadening was achieved through sample selection of impactful research from business and management fields and from a range of HEIs, rather than from physical, life or applied sciences and elite HEIs. The resulting typology of impact-related tensions is more comprehensive than existing typologies associated with knowledge commercialisation (notably Hackett, 1990, 2005; Merton, 1973, pp.270–305; Mitroff, 1974; Ziman, 1996), and demonstrates that the salience of certain tensions is mediated by the type of HEI in which impactful research is undertaken.

The study extends prior work through the identification of three novel tensions (Finding 1) (neutrality-bias, subjective-instrumental value and nodal proximity-distance) and the empirical observation of eight conceptual tensions (Finding 2) (impartiality-partiality, organised scepticism-dogmatism/expert, convergent-divergent thinking, global-local, nation state-competition state, centralisation-decentralisation, protective state-productive state and insider-outsider). Identification of the three novel tensions constitutes a response to Bartunek and Rynes' (2014) observation of a likelihood of further, thus far unidentified, tensions associated with the academic-practitioner gap, and by extension, impact. These, together with the eight empirically observed tensions offer new conceptual approaches to explore how academic behaviour is mediated by political, moral, temporal, epistemic, disciplinary and organisational contexts. In doing so, they enable a departure from Rip's (2011) notion of a "protected space" for science from society. The identification of these three novel tensions and their inclusion within an empirically confirmed typology of individual-level impact-related tensions constitute the first theoretical contribution of this study (Contribution 1).

6.4 Embedded agency and the logics perspective

Finding 3: Certain tensions are underpinned by forms of embeddedness not currently associated with the institutional logics perspective.

This study extends prior work on forms of embedded agency recognised within the institutional logics perspective. The forms of embeddedness currently associated with the perspective are cultural, social (relational and structural), cognitive, political and temporal (Granqvist and Gustafsson, 2016; Thornton, Ocasio and Lounsbury, 2012, pp.79–80), and Section 5.2 described how these underpin a range of tensions. However, Finding 3 demonstrates that a number of observed tensions are underpinned by alternative forms of embeddedness, namely epistemic, occupational, organisational, moral and knowledge. This highlights an inadequacy problematisation of the logics perspective concerning insufficient incorporation of different forms of embeddedness in the logics perspective. Consequently, this study develops the logics perspective through revelation of new types of embeddedness as theories of change (Contribution 2).

This contribution is significant for a number of reasons. First, it extends known social mechanisms of institutional generation, reproduction or transformation associated with the logics perspective (Table 2-3), although many of these mechanisms have been identified elsewhere. The additional mechanisms identified in this study include robust design (Hargadon and Douglas, 2001), signalling (Fontana, Geuna and Matt, 2006), leverage and convening (Dorado, 2005), collaborative micro-practices (Smets, Morris and Greenwood, 2012), power systems and routines (Scott, 2014, p.96), partner selection (Johnston and Huggins, 2018), national policies and the international competitive interactions these generate.

Second, it provides novel conceptual frameworks with which to address Thornton and Ocasio's recent call (2013, p.120) for further work on the micro-foundations of institutional logics. For example, Lam's (2010) call for further study on how individual academic orientations towards impact can be mediated by disciplinary and organisational contexts may be addressed using occupational, epistemic and organisational embeddedness. These are potentially fruitful areas of research because logics deployments have predominantly been limited to contexts of elite HEIs (Section 2.2) and because interdisciplinary tensions have thus far received

surprisingly little literature attention (Section 2.1), even though interdisciplinarity is increasingly emphasised by public funding bodies (Technopolis and SPRU, 2016). Similarly, the incorporation of moral embeddedness within the logics perspective should facilitate study of how moral contexts mediate individual orientations towards impact. This is an important question as directionality failures (Weber and Rohrer, 2012) concerning misalignments between R&D efforts and collective priority setting based on greatest need have already been identified within the pharmaceutical sector, one of the most highly developed triple helix systems (Mazzucato, 2016b; Ràfols and Yegros, 2017; UN, 2016). Finally, incorporation of knowledge embeddedness adds an additional dimension (knowledge characteristics) to Sauermann and Stephan's (2013) conceptual framework comparing industrial and academic science, enabling further work exploring heterogeneity during knowledge transfer and co-creation.

6.5 Quintenary social system of science

Finding 4: A majority of identified tensions are not associated with an often alluded to professional-market logics dualism, but various configurations of five logics.

The study broadens prior work on the constituent institutional logics of the societal system of science. Lam (2010) implicitly summarised studies deploying the logics perspective as holding a progressive coherence conceptualising a binary societal system in which a traditional academic professional logic was under attack by an entrepreneurial market logic. Finding 4 demonstrates that through adopting a broader quadruple bottom line perspective of impact rather than focussing on economic impact, a quintenary societal system operates, consisting of professional, market, state, community and corporate logics. While the professional-market dualism is significant, most identified tensions are underpinned by other dualisms or trialisms, notably the professional-corporate as academics, HEIs (Olssen and Peters, 2005) and nations (Cerny, 1997) increasingly adopt competitive and performative norms, practices, frames, identities and narratives from the private sector. This finding addresses the incompleteness problematisation noted in Section 2.2.3

concerning a neglect in studies deploying a logics perspective of impact contexts other than knowledge commercialisation.

Furthermore, the observed tensions and responses suggest that overall, a developmental change is underway within this quintenary social system where the majority of the prevailing practices and symbolic representations associated with the professional logic remain while others change in response to competing logics (Thornton, Ocasio and Lounsbury, 2012, p.164). On the one hand, there is an elaboration (an endogenous reinforcement) of the professional logic regarding normative expectations of impartiality and disinterestedness, ostensive models of impact, the engagement in social and policy critique, the defence of academic autonomy and the reification of the division of academic labour between qualitative and quantitative research communities, among other areas. On the other hand, there is an assimilation (incorporation of external dimensions) as elements of other logics become accepted by academics. This includes goals, strategies, practices, vocabularies, frames, modes of decision-making and control, schema, category membership, temporal frames and organisational structures drawn from the corporate, market, state and community logics.

6.6 Institutional pluralism and monism

Finding 5: Certain tensions are associated with one, rather than two or more, societal logics.

This finding extends prior work on how conflicts arise within institutional orders. Institutional pluralism, the situation faced by an actor that operates within multiple institutional spheres (Kraatz and Block, 2013, p.243), is currently the only source of conflicting logics discussed within the logics perspective (Jarzabkowski, Matthiesen and van de Ven, 2009, pp.284–285; Thornton, Ocasio and Lounsbury, 2012, p.142). According to Kraatz and Block (2013, p.243), an actor in a pluralistic context is “a member of more than one institutional category” (i.e. an institutional order with a central logic) and may experience multiple material and symbolic practices, organising principles, discourses and identities associated with each. These are expected to generate “conflict, contradiction or confusion...(as actors) seek to realize

these logics in action” (Jarzabkowski, Matthiesen and van de Ven, 2009, pp.284–285). Institutional pluralism has been implicit in deployments of the logics perspective to impact contexts, where the conceptualisation of a binary system consisting of market and professional logics predominates (Section 2.2.2).

However, Finding 5 reveals that certain tensions identified in Table 6-2 (neutrality-bias, ostensive-performative, risk-uncertainty, subjective-instrumental value and rigour-relevance, as well as aspects of convergent-divergent thinking) are associated with a single logic and therefore cannot be accounted for by institutional pluralism. This suggests an incommensurability problematisation (Locke and Golden-Biddle, 1997) of the logics perspective as the extant literature is incorrect in assuming institutional pluralism is the only source of contradictory logics. Consequently, this study develops the logics perspective through revelation of “institutional monism” as a new source of conflict arising within a single institutional order (Contribution 3).

Institutional monism, defined here as the situation faced by actors operating within a single institutional order, maintains consistency with the idea of each order possessing a single “central logic” (Thornton and Ocasio, 2013, p.101) at societal level while allowing for multiple representations of this logic at field level as field logics, embedded within various social mechanisms at other levels. Conflict would be expected to arise as actors seek to realise contradicting field logic representations of a single institutional order’s societal logic rather than those of two or more orders. This revelation of institutional monism is significant in that upto now, literature exploring impact contexts has largely ignored heterogeneity within academia (Sauermann and Stephan, 2013) apart from attitudes to market-oriented behaviours (Lam, 2010). Institutional monism offers a novel conceptual frame to explore academic heterogeneity regarding attitudes to risk, regulation and research field progressiveness, and to definitions of science, the latter offering utility in addressing Lam’s (2010) call for further study on how individual academic orientations can be mediated by disciplinary contexts.

Although beyond the scope of this study, it is interesting to consider how contradicting institutionally monistic logics emerge. A likely potential route is through the historical variance of logics and their shaping by economic and social structural changes (Thornton and Ocasio, 1999). For example, it is plausible that one or more

institutionally monistic tensions may have originally emerged through institutional pluralism, but the social mechanisms of pluralist institutional orders were subsumed over time as different traditions of a professional order. For example, Touraine (1971, p.332) implicitly interprets Kant's (1797 [1798]) differentiation of the socio-critical and utilitarian roles of University faculties as an subjective-instrumental value conflict emphasising contradicting University roles as an instrument of state bureaucratic reproduction or as an institution dedicated to humanistic societal emancipation. This tension is also implicit in Merton's (1936, pp.228–253) description of how the 17th century British invisible college legitimised its research as both manifesting the glory of God and enhancing the good of Man. The neutrality-bias tension is rooted in conflict between the Church's Aquinas-Aristotelian metaphysics and the state-oriented empiricism of Galileo and Bacon (Bhattacharya, 2012).

6.7 Generative tensions and responses

Finding 6: Typically, strategic responses to certain tensions are generative of impact, although occasionally defensive responses can also be generative.

There is little existing research in the area of generative impact-related tensions, likely due to the predominance of the contingency-based approach in explorations. Using paradox theory (Lewis and Smith, 2014; Smith and Lewis, 2011), Bartunek and Rynes (2014) have argued that strategic responses to tensions across the academic-practitioner gap results in sustainability of the tensions in generative ways, leading to positive outcomes for both actors. They suggest two categories of paradoxical tension which may elicit generative responses. “Belonging” is driven by complexity and plurality as individuals and groups seek both homogeneity and distinction, while “performing” stems from multiple stakeholders whose differing demands result in competing strategies and goals.

This study broadens Bartunek and Rynes work by extending the perspective beyond the academic-practitioner gap to include any impact-related tension which elicit responses that directly facilitate instances of impactful research. It confirms their proposition that strategic responses to the performing tension are generative, but finds no evidence of Belonging tensions being so. Finding 6 extends Bartunek and

Rynes work in two ways. First, it identifies the tensions in the categories of Learning, Performing/organising, Belonging/organising, Performing/belonging and Learning/organising which are generative when strategic responses are elicited (Table 5-6). Second, it identifies defensive responses to certain tensions which are also generative, though potentially to a lesser degree than strategic responses.

Finding 6 enables a contribution to practice as a response to Nurse's call for "artificial barriers which reduce permeability or mutual respect between the different parts of the (UK research) system (to) be resisted as they reduce the effectiveness of the research system" (Nurse, 2015, p.3). Where resistance is interpreted as a defensive response to an underlying tension, this is likely to have inadvertent detrimental consequences to research effectiveness as typically, such responses are not generative. *Contribution 4* of this study is that *barriers to research effectiveness should be responded to strategically, rather than defensively in order to maximise impact generation.*

At an individual level, the utility of this study is three-fold. First, the tensions typology may be used by academics considering or actually engaging in impact activities both to unpack and identify a specific tension they may be experiencing and to reflect on why the tension has become salient. Second, it enables the individual to think through the implications of approaching the tension as a dilemma (choice between competing options, each with advantages and disadvantages), a dialectic (contradictory elements resolved through integration but, over time, will lead to new opposition) or a paradox (contradictory yet interrelated elements that exist simultaneously and persist over time) (Smith and Lewis, 2011), and in particular any predicted and unintentional consequences of contingency-based responses in managing the tension. Third, it provides illustrative examples of the experiences of other academics in responding to the tension in both strategic and defensive ways.

At an organisational level, this study is intended to assist deans by enhancing the dynamic capabilities [(an organisation's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments (Teece, Pisano and Shuen, 1997)] of business schools to generate impact. This may be illustrated using the entrepreneurial university dynamic capabilities identified by Leih and Teece (2016). For example, the study provides a training resource to

develop faculty competencies in, and change attitudes to, impact generation, which would be expected to enhance the school's sensing capability to identify emerging trends and funding opportunities and threats. It may enhance the school's seizing capability by providing a basis for a segmented approach to resource allocation, and both stakeholder and conflict management. Finally, it may enhance the school's transforming capability by facilitating decisions to shut down poorly performing initiatives and by ultimately developing a climate of entrepreneurship through the school.

6.8 Summary

This chapter has discussed the study's main findings and key contributions both to the literature and to practice. The final chapter examines its limitations, including directions for further research.

7 CONCLUSIONS

This chapter concludes this thesis, discusses the limitations of the research, as well as opportunities for further study.

7.1 Context summary

Since the 1980s, commercial competitiveness has been emphasised as a rationale for research and development as an alternative to production of certified knowledge (Slaughter and Rhoades, 1996). This has surfaced various tensions within the societal system of science (notably Hackett, 1990, 2005; Merton, 1973, pp.270–305; Mitroff, 1974; Ziman, 1996) as a third mission of the University (Etzkowitz, Ranga and Dzisah, 2012; Grimaldi et al., 2011), innovation and entrepreneurship, emerged.

The introduction of impact as part of REF2014 (HEFCE, 2011), the first national systematic evaluation of the social, economic, environmental and cultural effects of research (Hinrichs-Krapels and Grant, 2016), considerably broadens the third mission. It is therefore likely to lead to the emergence of an extended set of tensions within the societal system of science. However, it is questionable as to how aware scientists are of such tensions, or how capable they are of mitigating these tensions.

Our understanding of this new knowledge regime and its consequences for academic scientific work has been limited by oversimplified theoretical assumptions about the underlying process of change and a narrow and fragmented literature focus (Lam, 2010). The institutional logics perspective (Thornton, Ocasio and Lounsbury, 2012) offers the potential for overcoming the former, but deployments to date have retained a narrow focus and consequently are associated with various incompleteness, inadequacy and incommensurability problematisations.

7.2 Summary of the approach

This study adopted an exploratory, holistic, multiple-case design (Yin, 2009, p.46), analysing the experiences of 30 focal academics of 32 REF2014 impact case studies, selected from a total pool of 432 submissions to the business and management UOA. The central goal was to contextualise the phenomenon of

impact-related tensions by locating each tension within a conditional structure of institutional logics and social mechanisms, and to relate this to the process by which tension responses are elicited.

Qualitative data was gathered via 30 semi-structured interviews, supplemented by publicly available sources (REF impact case studies). An informed grounded theorising strategy (Thornberg, 2012) was employed to analyse the resulting data. This included the identification of a coding frame that captured relevant portions of data. The patterns that ultimately emerged from the data involved a range of sub-constructs linked to the theme of impact-related tensions. This approach enabled the discovery of patterns across cases.

7.3 Summary of the findings

The findings offered evidence that multiple institutional logics combine in impact contexts to produce a wide variety of tensions, in turn eliciting varying responses from actors. In particular, the study yielded six key insights: (i) three novel tensions were identified; (ii) eight conceptual tensions were empirically observed (iii) certain tensions are underpinned by forms of embeddedness not currently associated with the institutional logics perspective; (iv) most identified tensions are not associated with an often alluded to professional-market logics dualism, but various configurations of five logics; (v) certain tensions are associated with one, rather than two or more, societal logics; and (vi) typically, strategic responses to certain tensions are generative of impactful research, although occasionally defensive responses can also be generative.

7.4 Theoretical contributions

This study consolidates prior work through a reconciliation of tensions identified within the STS, SPIS and innovation studies literature. Based on the empirical testing of these tensions, it makes three contributions to theoretical knowledge.

Contribution 1 is the development of a typology of individual-level impact-related tensions. This consolidates the most comprehensive existing typologies of academic tensions (Hackett, 1990, 2005; Merton, 1973; Mitroff, 1974; Ziman, 1996), and

provides empirical confirmation for eight tensions which have only been conceptual in nature upto now. It extends this prior work through the identification of three novel tensions (neutrality-bias, subjective-instrumental value and nodal proximity-distance). It also identifies an incompleteness problematisation in prior work which has deployed the above cited typologies to contexts of economic impact achieved through knowledge commercialisation from the physical, life or applied sciences, and broadens this work by exploring a broad range of quadruple bottom line impacts underpinned by business and management research. The typology of impact-related tensions developed in this study (Table 6-2) is the most comprehensive of its kind, both conceptually and empirically.

Contribution 2 is the development of the institutional logics perspective through revelation of new forms of embedded agency as theories of change, following the identification of an inadequacy problematisation concerning insufficient incorporation of different forms of embeddedness within the perspective. Prior work has identified cultural, social (relational and structural), cognitive, political and temporal embeddedness as theories of change (Granqvist and Gustafsson, 2016; Thornton, Ocasio and Lounsbury, 2012, pp.79–80). This study extends this work through the identification of epistemic, occupational, organisational, moral and knowledge embeddedness as additional theories of change.

Contribution 3 is the development of the logics perspective through revelation of “institutional monism” as a new source of conflict arising within a single institutional order. Prior work (Jarzabkowski, Matthiesen and van de Ven, 2009, pp.284–285; Thornton, Ocasio and Lounsbury, 2012, p.142) has emphasised institutional pluralism, the situation faced by an actor that operates within multiple institutional spheres (Kraatz and Block, 2013, p.243), as the only source of conflicting logics discussed within the logics perspective. This study argues that this represents an incommensurability problematisation and extends this prior work by deducing that a separate mechanism accounts for tensions which arise through diverging representations of a single logic. This novel mechanism is named institutional monism, and is defined as the situation faced by actors operating within a single institutional order.

7.5 Practical contributions

Contribution 4 is a contribution to practice stating that barriers to research effectiveness should be responded to strategically rather than defensively in order to maximise impact generation. This is made in response to Nurse's (2015) call for "artificial barriers which reduce permeability or mutual respect between the different parts of the (UK research) system (to) be resisted as they reduce the effectiveness of the research system". This confirms Bartunek and Rynes' (2014) proposition that strategic responses to performing tensions are generative. It also extends this work by finding that learning, performing/organising, belonging/organising, performing/belonging and learning/organising tensions are also generative when strategic responses are elicited, while defensive responses to certain tensions are also generative. The utility of this contribution is elaborated at an individual level, in that the typology may be used to identify specific tensions experienced in impact work and reflect on their salience, to think through the implications of approaching the tension as a dilemma, dialectic or paradox, and to see illustrative examples of the experiences of other academics responding to the tension in both strategic and defensive ways. Utility at an organisational level is also elaborated, in that the study may be used to enhance the business school dynamic capabilities of sensing opportunities and threats, seizing opportunities and transforming school operations and culture.

7.6 Limitations

Several limitations of this study are noted and may be categorised as those relating to case selection, theoretical saturation and the time horizon of the study.

7.6.1 Case selection and transferability

As described in Section 4.3, cases for this study were selected from a population of academics who submitted their work for assessment in the REF2014 business and management UOM. These academics were all mid-, late-career or emeritus researchers (Table 4-3), primarily because these were the academics whose work was submitted to REF2014 by HEIs. As a consequence, no early-career

researchers or students were included during case selection, and any mention of ECRs' perspectives within this study is made from the perspective of these more established academics. Because of this limitation, it is recognised that other tensions not discussed in this study may be salient for ECRs and research students in impact contexts.

With the above caveat, the claim for transferability of this study's findings from the sample to all impactful business and management research in UK HEIs is relatively strong, based on fittingness, or the degree of congruence between sample and target population (Glaser, 2006, p.9). The claim for transferability to all UK HEI-based impactful research is weaker, given a greater likelihood of demographic dissimilarities across disciplines, notably cultural (Becher and Trowler, 2001). However it is still considerable based on conceptual generality (Glaser, 2006).

7.6.2 Cross-section perspective

The majority of interviewees, when first questioned about the tensions they experienced in impact contexts, stated that they had not experienced any. This was due in part both to the temporal bounding of REF2014 submissions (research undertaken between January 2008 and December 2013) so that interviewees were being questioned about activities carried out some time in the past, and to the fact that many tensions would not have been experienced as difficulties or challenges, but as quite normal and eliciting routine responses. The semi-structured interview was successful in all cases in eliciting information regarding tensions, and the choice of cross-sectional rather than longitudinal fieldwork had the advantage of enabling the exploration of multiple case studies in a diverse range of HEIs. Nonetheless, a longitudinal perspective would provide greater insight into the tensions and responses experienced in impact contexts.

7.6.3 Theoretical saturation

Another limitation linked to the number of interviews concerned the theoretical saturation of the data. Certain tensions, such as universalism-localism, breadth-

narrowness or internal-external orientation appeared across all groups and within most cases, suggesting theoretical saturation was reached and indicating the data's reliability. Other tensions, such as communalism-proprietary or disinterestedness-interestedness/authoritarian were identified in a surprisingly small number of cases, despite the iterative nature of the semi-structured interviews. This suggests that theoretical saturation may not have been reached for such tensions and that further research is needed.

7.7 Dissemination and further research

While this study faced a number of limitations, it nevertheless makes significant theoretical and practical contributions. Given the diversity of the findings, there are plans to share the outcomes of this thesis with HEIs, learned societies (including the Royal Society) and with non-governmental organisations (including Wellcome Trust).

This study also proposes a number of future research opportunities. For example, further studies based on the tensions typology should be conducted to develop more robust insights into those tensions for which theoretical saturation may not have been achieved, as described above. Second, the typology could be tested within UOMs outside business and management, in order to develop insights across the whole societal system of science. These studies could be either qualitative or quantitative in nature.

Further research could also be conducted exploring specific tensions identified in this study as lacking significant empirical attention, such as disciplinarity-interdisciplinarity, or early career researcher (ECR) perceptions of the individual-collective tension. With regards to the latter, the application of Beck's *individualisierung* or anomic individualism (Beck and Beck-Gernsheim, 2002), which does not presuppose the continued existence of historic institutional structures, may be interesting. Finally, the application of a paradox perspective (Lewis and Smith, 2014) to the typology would further extend Bartunek and Rynes' work (2014) and potentially enrich the paradox meta-theory were less developed themes to be targeted (Schad et al., 2016).

7.8 Reflection on personal bias

A researcher undertakes a piece of research while possessing a variety of personal characteristics, such as gender, race, affiliation, age, sexual orientation, immigration status, personal experiences, linguistic tradition, beliefs, biases, preferences, theoretical, political or ideological stances, and emotional responses to participants, which may influence the project (Berger, 2015). Such personal characteristics are not a bad thing (Strauss and Corbin, 1998, p.97), and while it is not possible to specify procedures which would systematically eliminate the bias and error that arises because of them (Norris, 1997), it is important to recognise whether such biases are intruding into analysis and to mitigate them as much as possible.

According to Berger (2015), personal characteristics may impact research in three ways. First, they can affect access to participants who may be more willing to share their experiences with a researcher perceived as sympathetic to their situation. This bias was mitigated by adopting the role of an “insider”, through selecting the REF2014 business and management UOA as the population of interest. This offered the advantages of easier access, facilitated by the researcher’s Cranfield affiliation and occasionally through introductions made by colleagues, and familiarity with the topic (Padgett, 2008, p.20).

Second, they may shape the nature of the researcher–participant relationship, in turn affecting the information that participants are willing to share. Engaging in reflexivity, “the process of a continual internal dialogue and critical self-evaluation of researcher’s positionality as well as active acknowledgement and explicit recognition that this position may affect the research process and outcome” (Berger, 2015), throughout the study, I was aware that varying degrees of affinity developed between myself and participants, particularly those which appeared most reflexive upon questioning or were engaging raconteurs.

This was mitigated through adopting the role of an “outsider” (Irvine, Roberts and Bradbury-Jones, 2008), intended to empower the participant within the role as expert in the researcher-participant relationship. This was done through choices made in the research design. No participant was known personally to the researcher prior to interview. Other than the information contained within REF impact case studies, which was read prior to interviews, the researcher was familiar with only one

participant's body of work. The use of semi-structured interviews limited contact time with participants to at most one hour. The use of a holistic multiple-case design, purposive sampling and cross-case analysis to demonstrate meaningful parallelism across data sources also reduced possible bias due to affinity with any one participant.

Third, the worldview and background of the researcher affects the way in which he or she constructs the world, uses language, poses questions, and chooses the lens for filtering information gathered from participants and making meaning of it, and thus may shape the findings and conclusions of the study. Through reflexivity, I was aware that my worldview shifted considerably during the course of this study, starting as utilitarian ("it is right that academics do impact"), transitioning through libertarian ("it is wrong that academics are made to do impact"), and finishing as humanistic ("it is good that academic knowledge be used to derive societal benefits, though this may be done in a multitude of ways").

I attempted to mitigate this in two ways. First, I employed a theorising strategy which utilised informed grounded theory to take advantage of relevant, pre-existing concepts, tempered by theoretical agnosticism, pluralism and sampling which drove me to find alternative and better explanations for my empirical observations. This was instrumental in the incorporation of an STS perspective in addition to SPIS and innovation studies, particularly as STS tensions had not been identified in my initial systematic literature review. Second, I sought to construct research questions which reduced the likelihood of influencing participants. To illustrate, a participant in an early interview challenged my use of the term "tension" as this had negative connotations for her of which I was unaware. Instead, I questioned subsequent participants about the "challenges" they experienced. Nonetheless, I am aware that my relative inexperience as a doctoral researcher has likely influenced this study and its findings and conclusions.

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APPENDICES

APPENDIX A: LITERATURE IDENTIFICATION

Identification method	Papers
Systematic literature review	(Abreu et al., 2009; Ambos et al., 2008; Anderson, Michael and Peirce, 2012; Avenier and Cajaiba, 2012; Bartunek and Rynes, 2014; Benner and Sandström, 2000; Bjerregaard, 2010; Braun, 2003; Breznitz and Feldman, 2012; Bridgman, 2007; Chia, 2014; Colyvas, 2007; Crespo and Dridi, 2007; Cyert and Goodman, 1997; D'Este and Perkmann, 2010; Debackere and Veugelers, 2005; Demain, 2001; Etzkowitz, 2013; Etzkowitz and Zhou, 2008; Feldman and Desrochers, 2004; Garrett-Jones et al., 2005; Goldstein, 2010; Gornitzka, 1999; Gunasekara, 2006; Hagen, 2002; Harloe and Perry, 2004; Harryson, Kliknaite and Zedtwitz, 2008; Häyriinen-Alestalo and Peltola, 2006; Healy, 2003; Hicks, 2012; Hong and Walsh, 2009; Jacob et al., 2000; Jain, George and Maltarich, 2009; Jones, 2009; Jongbloed, 2015; Jongbloed, Enders and Salerno, 2008; Kauppinen, 2012; Keisu, Abrahamsson and Rönnblom, 2015; Kenney, 1987; Kirkland, 2005; Kneller et al., 2014; Knights and Scarbrough, 2010; Kruss, 2006; Kumar, 2010; Lam, 2010, 2011; Lander, 2016; Lee, 1998; Lehrer, Nell and Gärber, 2009; Lind, Styhre and Aaboen, 2013; Lissoni and Montobbio, 2015; Loan-Clarke and Preston, 2002; van Looy, Callaert and Debackere, 2006; Maassen and Stensaker, 2011; Mintrom, 2008, 2009; Mohrman, Ma and Baker, 2008; Morandi, 2013; Murray, 2010; Nicolai, Schulz and Gobel, 2011; O'Kane et al., 2015; Orr and Bennett, 2012; Owen-Smith, 2003; Parker and Crona, 2012; Philpott et al., 2011; Popp Berman, 2012; Powell and Owen-Smith, 1998; Provasi, Squazzoni and Tosio, 2012; Rappert, Webster and Charles, 1999; Rappert and Webster, 1997; Rasmussen, 2011; Rasmussen and Gulbrandsen, 2012; Richter and Hostettler, 2015; Rosa and Dawson, 2006; Sanders and Miller, 2010; Sauermann and Stephan, 2013; Shibayama, 2015; Shibayama, Walsh and Baba, 2012; Slaughter, 1993; Smith-Doerr and Vardi, 2015; Steinmo, 2015; Styhre and Lind, 2010b, 2010a; Swan et al., 2010; Tuunainen and Knuuttila, 2008, 2009; Vallas and Kleinman, 2008; Verspagen, 2006; Vostal and Robertson, 2012; Welsh et al., 2008; Wersun, 2010; Whitchurch, 2010; Ylijoki, 2003)
Manual search	(Anderson et al., 2010; Ayres, 1944; Barber, 1952; Bourdieu, 1975, 1983, 1997; Buchanan, 1975; Delanty, 2001a; Douglas, 2009; Fini and Toschi, 2016; Giddens, 1991; Greenwald and Stiglitz, 2013; Guston and Keniston, 1994; Hackett, 1990, 2005; Kagan, 2009; Klein, 1990; Kuhn, 1977, 1996; Lacey, 1999; Lynskey, 2006; Mazzucato, 2016a; Menger, 1976; Merton, 1968, 1972, 1973; Mitroff, 1974; Perkmann and Schildt, 2015; Polanyi, 1962; Snow, 1959; Tool, 2000; Weingart, 1999; Ziman, 1996)

Through
theoretical
sampling
during
analysis

(Abramovsky and Simpson, 2011; Adler, Goldoftas and Levine, 1999; Albert and Bartunek, 2016; Amin and Roberts, 2008; Ancona, Goodman and Lawrence, 2001; Anderson, Martinson and de Vries, 2007; Andreoli-Versbach and Mueller-Langer, 2014; Arvanitis and Woerter, 2015; Ashby, Riad and Davenport, 2019; Barnes and Dolby, 1970; Barry and Born, 2013; Bartunek and Louis, 1996; Baycan and Stough, 2012; Beck and Beck-Gernsheim, 2002; Beckert, 1999; Beesley, 2003; Berdahl, 1990; Bessant et al., 2015; Boardman and Ponomariov, 2009; Bodas Freitas, Geuna and Rossi, 2012, 2013; Boitier and Rivière, 2016; Bornmann, Nast and Daniel, 2008; Boschma, 2005; Bouchikhi, 1998; Bowman and Ambrosini, 2000; Boyd, Finkelstein and Gove, 2005; Boyd and Smith, 2016; Bozeman, Fay and Slade, 2013; Bozeman and Corley, 2004; Bridgman, 1947; Buanes and Jentoft, 2009; Bullinger, Kieser and Schiller-Merkens, 2015; Byrne and Bond, 2014; Calhoun, 2003; Campbell et al., 2000; Carayannis and Campbell, 2012; Carayannis and Rakhmatullin, 2014; Cerny, 1997; Chesbrough, Lettl and Ritter, 2018; Chesneaux, 2000; Clegg, da Cunha and e Cunha, 2002; Cohen and Levinthal, 1990; Cooper, 2009; Cox, 2005; Crescenzi, Nathan and Rodríguez-Pose, 2016; Czarnitzki, Glänzel and Hussinger, 2009; D'Este, Guy and Iammarino, 2013; Daft and Lewin, 2008; Dasgupta and David, 1994; David, 2003; Davis, Larsen and Lotz, 2011; Delanty, 1998, 2001b; Denis, Langley and Rouleau, 2007; Dicken, 1994; Dimaggio, 1988; Dougherty, 2016; Dougherty et al., 2013; Earley and Gibson, 1998; Elmuti, Abebe and Nicolosi, 2005; Embirbayer and Micshe, 1998; Etzkowitz, 2011; Eun, Lee and Wu, 2006; Fabrizio, 2007; Fagerberg, 2017; Farjoun, 2010; Feldman, 2000; Flink and Kaldewey, 2018; Fougner, 2006; Fox, 1994; Gauchat, 2015; Gauchat and Andrews, 2018; Gibbons et al., 1994; Giddens, 1984; Glaser, 1963; Gottlieb and Keith, 1997; Grabher, 1993; Granovetter, 1973, 1983; Gustafsson and Autio, 2011; Habermas, 1989; Hagstrom, 1964; Haller and Roudometof, 2010; Hodgkinson and Rousseau, 2009; Hofstede, 1980; Holt, Goulding and Akintoye, 2014; Huff and Huff, 2001; Hughes, 2011; Jack, 2005; Jarvenpaa and Wernick, 2011; Kieser, Nicolai and Seidl, 2015; Kieser and Leiner, 2009; Kleijnen et al., 2009; Klein, 1996, 2003; Knights, 2008; Knudsen, 2002; Kolympiris and Kalaitzandonakes, 2013; Latour, 1987, 1986; Latour and Woolgar, 1986; Laudel and Gläser, 2014; Laursen, Reichstein and Salter, 2011; Laursen and Salter, 2014; Lavie, Stettner and Tushman, 2010; Lee and Bozeman, 2005; Lincoln and Guba, 2000; Lissoni, 2010; Lorenz, 2012; Louis and Bartunek, 1992; Lübbe, 1986; MacIntosh et al., 2017; MacPherson, 1998, 2002; Maitlis and Christianson, 2014; Manathunga, 2009; Manville et al., 2014; March, 1991; Margolis and Walsh, 2003; Mazzucato, 2013; Miller, 2014; Milliken and Colohan, 2004; Minshall, Mortara and Ulrichsen, 2016; Mirowski, 2018; Mulkay, 1969; Naples, 1996; Ní Mhurchú et al., 2017; Nootboome, 1999; Olssen and Peters, 2005; Parsons and Shils, 1951; Pels, 2003; Pentland and Feldman, 2008; Perkmann, Salter and Tartari, 2011; Pfeffer, Leong and Strehl, 1977; Phelps, Heidl and Wadhwa, 2012; Pielke, 2012; Polk, 2014; Provan and Kenis, 2008; Putnam, 2002; Rappert, 1995; Rasche and Behnam, 2009; Rayner and Malone, 1998; Romme et al., 2015; Rossi, 2010; Roudometof and Haller, 2007; Ruggie, 1982; Russell, 1960; Sako, 1992; Schauz, 2014; Siggelkow and Levinthal, 2003; Simmel, 1920; Smith, Ward and House, 2011; Smith and Lewis, 2011; Smith and Tushman, 2005; Soekijad, Huis and Enserink, 2004; Stiglitz, 1999, 2016; Suchman, 2013; Sundaramurthy and Lewis, 2003; Tartari and Breschi, 2012; Torre Shaw and Gilly, 2000; Toulmin, 1972; Tranfield and Starkey, 1998; van de Ven and Johnson, 2006; Weick, 1995; Weingart, 2000; Wenger, 1998; West and Bogers, 2014; Willemsse and de Beer, 2012; Williams, 2007; Woelert and Millar, 2013; Yokoyama, 2006)

APPENDIX B: SEARCH STRINGS

Number	String
1	(Universit* OR academ* OR "higher education")
2	("Third mission" OR "third stream" OR impact OR service OR "academic capitalism" OR global* OR internationali*ation OR "open science" OR "open data" OR "open access" OR helix OR policy OR "knowledge economy" OR "information society" OR "knowledge society" OR transdisciplin* OR interdisciplin* OR cross-disciplin* OR mobility OR Ranking* OR "world-class universit*" OR collegiality OR "academic freedom")
3	(Hybrid* OR strategi* OR governance OR ambidext* OR TTO OR "technology transfer" OR incubator OR cluster* OR "open innovation" OR network OR *system OR managerialis* OR value OR efficien* OR excellen* OR "corporate universit*" OR "entrepreneurial universit*")
4	(Entrepreneur* OR ventur* OR co-develop* OR cooperat* OR co-creat* OR partner* OR collaborat* OR "joint research" OR consult* OR "Mode 2" OR "boundary span*" OR "spin-off" OR "start-up")
5	(Tension* OR paradox* OR dualit* OR dilemma* OR contradict* OR dialectic* OR dichotom* OR demand* OR competit* OR conflict*)
6	(Compromise* OR "trade-off" OR inconsistanc* OR balance OR compliment* OR contingen* OR contest* OR adopt* OR adapt* OR resist*)

APPENDIX C: INTERVIEW PROTOCOL

Establishing rapport

Introductions, outline of research interest, clarify confidentiality and anonymity of the study. Sign consent form.

Interviewee details: Demographics

Seek to understand the impact case study, its contextual origins, stakeholders, problem choice, research methodology, research outputs, pathways to impact and both claimed/unclaimed impact.

Interview Questions:

Overall purpose: to elicit rich, highly contextual, free associative data concerning impact-related tensions and responses. Collecting peripheral phenomena for informing future thinking.

Level of interest	Types of embeddedness	Questions
Societal level	Political, moral	How does impactful research differ from traditional research? What is the role of the University/academic research in society?
Field level (including team and dyadic levels)	Cultural, cognitive, structural, relational, temporal, knowledge,	What challenges did you experience in this impact case study: ...In problem choice? ...In how research was carried out? ...In terms of inter/transdisciplinarity? ...In how findings were disseminated? Would stakeholders agree with these challenges? How did these challenges make you feel? How did you respond to these

		<p>challenges?</p> <p>Did these responses resolve the challenge?</p> <p>If you could repeat the work, would you change your approach?</p>
Organisational level	Organisational	<p>What is the role of the business school (or equivalent) in the University? In society?</p> <p>How does the business schools and faculty members perceive:</p> <p>... impact generation in general?</p> <p>...your impact work?</p> <p>What kind of impact is unique to business schools?</p> <p>How is impact related to teaching?</p> <p>What needs to change?</p> <p>If the business school disappeared tomorrow, would anyone notice?</p>
Individual level	Occupational	<p>How do you perceive impact?</p> <p>Has your impactful research had positive/negative implications for your career?</p>

Finish: Thank you for your time. Any questions? Anything you think I might have missed? Anyone else I should talk to?

APPENDIX D: INTERVIEW CONSENT



INTERVIEW CONSENT FORM

I, the undersigned, confirm that (please tick box as appropriate):

1.	I have read and understood the information about the project, as provided in the Information Sheet provided.	<input type="checkbox"/>
2.	I have been given the opportunity to ask questions about the project and my participation.	<input type="checkbox"/>
3.	I voluntarily agree to participate in the project.	<input type="checkbox"/>
4.	I understand I can withdraw at any time without giving reasons and that I will not be penalised for withdrawing nor will I be questioned on why I have withdrawn.	<input type="checkbox"/>
5.	The procedures regarding confidentiality have been clearly explained (e.g. use of names, pseudonyms, anonymisation of data, etc.) to me.	<input type="checkbox"/>
6.	I understand that taking part in the study will include being interviewed and audio recorded	<input type="checkbox"/>
7.	The use of the data in research, publications, sharing and archiving has been explained to me.	<input type="checkbox"/>
8.	I understand that other researchers will have access to this data only if they agree to preserve the confidentiality of the data and if they agree to the terms I have specified in this form.	<input type="checkbox"/>
9.	Select only one of the following: <ul style="list-style-type: none"> • I would like my name used and understand what I have said or written as part of this study will be used in reports, publications and other research outputs so that anything I have contributed to this project can be recognised. • I do not want my name used in this project. 	<input type="checkbox"/>
		<input type="checkbox"/>
10.	I, along with the Researcher, agree to sign and date this informed consent form.	<input type="checkbox"/>

Signature of participant: _____ Date: _____

Name of participant in Block capitals _____

Researchers signature: _____ Date: _____

APPENDIX E: PARTICIPANT INFORMATION SHEET

INFORMATION SHEET

Thank you for agreeing to participate in this doctoral research project.

The research problem under investigation concerns the changing landscape of academic research in the context of an imperative for research “impact”, i.e. benefit to a non-academic cohort. The literature contains many examples of the challenges that this imperative creates for academic researchers and their stakeholders, such as academic rigour/relevance of findings, knowledge considered as a means or as an end in itself, the selection of local versus global/cosmopolitan research goals and difficulties engaging in interdisciplinary research. My research project aims to explore what challenges have been experienced during research submitted to REF2014, how these challenges were experienced, and what types of responses they elicited (e.g. how the challenge was resolved, mitigated, avoided, ignored, used creatively, etc.)

The interview should be approximately 1 hour in length. It will be audio recorded and subsequently transcribed for analysis. Collectively, the findings of my research will be incorporated into my PhD thesis and future academic papers. Names and institutional affiliations shall be anonymised in all subsequent publications and presentations (unless otherwise specified by the interviewee).

Please feel free to ask me any questions before beginning.

Thank you

Len Kelleher