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FACULTY OF BUSINESS, LAW AND ART

Southampton Business School

EXPLORING RESPONSIBLE KNOWLEDGE EXCHANGE

Linda Baines

Thesis for the degree of Doctor of Philosophy

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ABSTRACT

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EXPLORING RESPONSIBLE KNOWLEDGE EXCHANGE

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Knowledge exchange has been incorporated into the roles of universities and public sector research establishments (PSREs) in the UK alongside research and teaching. Universities and PSREs have spent much time ensuring that research ethics are managed effectively and much has been written about this. However, little research has been done to explore the ethical issues and questions which can arise in knowledge exchange. This thesis seeks to address a gap in the ethics of universities and PSREs by exploring the ethics and values of knowledge exchange.

Previous studies have considered the position of knowledge exchange in universities and PSREs and academic involvement in it. Based on interviews with knowledge exchange practitioners, the thesis illuminates the interaction between knowledge exchange and CSR in universities and PSREs. The research finds links between the roles of universities and PSREs, the practice of CSR and knowledge exchange. The study identifies new ways of understanding the scope of knowledge exchange, and sheds new light on the relationship between knowledge exchange and impact. The thesis offers new understanding about how universities and PSREs apply stakeholder management, and offers insights into how universities and PSREs decide how to engage with external organisations. The thesis sheds light on how CSR is practised in universities and PSREs, and demonstrates how CSR is an implicit part of the mindset of universities and PSREs. The research findings show how knowledge exchange is influencing academic values and how a modified set of these can provide a starting point for defining knowledge exchange ethics and values.

The study shows how managing ethical issues in knowledge exchange is a task that still needs to be addressed. The concept of Responsible Knowledge Exchange can provide a starting point for this by encouraging debate about the responsibilities of knowledge exchange practitioners, and their ethics and values. Raising awareness about the kind of ethical dilemmas which knowledge exchange practitioners can face may prompt universities and PSREs and knowledge exchange professional networks, such as AURIL and PraxisUnico, to develop ways and ideas for handling

and managing ethical issues in knowledge exchange. These kinds of approaches could help to foster more awareness of values and ethical boundaries in knowledge exchange, and greater awareness of the issues that can arise.

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DECLARATION OF AUTHORSHIP

I, Linda Baines, declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

Exploring Responsible Knowledge Exchange

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;

2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;

3. Where I have consulted the published work of others, this is always clearly attributed;

4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;

5. I have acknowledged all main sources of help;

6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;

7. None of this work has been published before submission

Signed: ....

Date: January 2016

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Chapter 1:   Introduction

1.1 Scope of the study

Governments in the UK and United States (US) believe that universities and Public Sector Research Establishments (PSREs) (collectively referred to as "knowledge exchange organisations" – KEOs) can contribute to economic growth. KEOs can do so by applying their knowledge and making it readily available to the public, particularly business. This process or function is known as "knowledge exchange" or "knowledge transfer", and the terms are commonly used to refer to the movement of knowledge from KEOs into the public domain. This process is sometimes referred to as universities' "third mission" (where research and teaching are their first two missions or core activities) (Jongbloed et al. 2008; Rossi 2010).

The increasing emphasis on knowledge exchange is part of wider changes in the role and mission of universities which have occurred since World War II. The emergence of knowledge exchange alongside research and teaching in UK universities has formed part of the changing role of and expansion of higher education and the alleged "commodification" of knowledge (Nelles and Vorley 2008; Watermeyer 2014b; Labory et al. 2015; Siegel and Wright 2015). This has apparently been accompanied by the introduction of business values into KEOs, the creeping commercialisation of higher education and the erosion of academic values and norms (Henkel 2007). Although academia has developed sound governance frameworks for research, few attempts have been made to explore how ethical issues, which can arise for individuals engaged in knowledge exchange, can be managed most effectively.

The overall objective of this thesis is to explore the concept of "Responsible Knowledge Exchange" by investigating the interaction of Corporate Social Responsibility (CSR) and ethics with knowledge exchange. This thesis aims to look at some of the issues surrounding ethics and values in knowledge exchange, how they should be addressed and the kind of questions that should be asked. Doing so involves exploring the scope of and rationale for knowledge exchange, and considering broader issues about KEOs' roles, and how KEOs

understand and manage their social responsibilities. It takes account of changes in Government policy, and shifts in relationships between KEOs and external organisations. It considers the relevance of CSR to KEOs, and the insights that CSR, academic and other values, and business ethics can contribute to developing a sustainable approach to knowledge exchange.

1.2 Elements of the Conceptual Framework

This section introduces some of the key concepts which will be explored in the thesis.

1.2.1 The position of knowledge exchange

KEOs are facing increased pressure for their research to underpin the Government's economic agenda. Universities and PSREs, including research councils, now undertake knowledge exchange alongside their research activities, as part of their core functions. The UK Government ("the Government") expressed clear support for university–business engagement and the promotion of enterprise in higher education as early as the mid-nineteen eighties (Department for Education and Science (DfES) 1986). The Government's response to the Baker Report in 2000 extended this approach to PSREs including the research councils (Baker 1999; HM Treasury and Office of Science and Technology (OST) 2000). The Government reinforced its commitment to knowledge exchange by launching the Higher Education Innovation Fund (HEIF) and PSRE Fund in 2001 to develop knowledge exchange activities and skills in KEOs. Since then several reviews, some at the Government's behest, have considered ways to overcome alleged barriers to university-business collaboration (Lambert 2003; Sainsbury 2007; Saraga 2007; Dowling 2015).

Although the Government has adopted a policy of encouraging KEOs to contribute to the economy, this differs from the legislative approach which the US Government took. Views about the significance and consequences of the Bayh-Dole Act (1980) differ (Lee 1996; Anderson 2001; Economist 20 December 2005; Washburn 2005); a common conclusion is that the main outcome was to consolidate many existing arrangements for commercialising KEO research (Jongbloed et al. 2008). Similarly, the Government's emphasis on how KEOs

can contribute to the national economy has to be seen within the broader EU context. The development of the EU knowledge agenda since 2000 has reinforced the growing integration of research, education and innovation, the so-called "'knowledge triangle" (Soriano and Mulatero 2010) as part of a knowledge-based economy (Mircea-Iosif 2013).

The growth of knowledge exchange is seen as part of a cultural shift in universities. This forms part of broader debate about the change in the mission and role of KEOs, and their relationship with industry as the economy moves from a manufacturing to a knowledge-based one. It is reflected in the changing nature of the relationship between universities, industry and government, the 'triple helix' model (Etzkowitz 2011; Etzkowitz 2014). KEOs have also been subject to managerialism, that is, government reform of public sector organisations where private management sector practices are applied to public sector organisations (Shattock 2008; Miller 2014). This is echoed in the emergence of "market logic" and demands for increased accountability and monitoring (Watermeyer 2014a). These influences are linked to the growing "corporatisation" of universities, with institutions being run like major corporate firms with the introduction of business values into higher education (Langley and Parkinson 2009).

The rise of the "third mission" in universities can be seen as a response to shifts in their mission and position in society as well as changes in societal expectations of them. Knowledge exchange is seen as a way of proving the impact of Government investment in KEOs. Funding agencies such the Higher Education Funding Council for England (HEFCE) and the research councils require academics to demonstrate the impact of their research; i.e. the economic, social, cultural, public policy, quality of life and environmental benefits of the research which KEOs and academics undertake. These changes in universities have influenced reform in other areas, such as their governance, accountability and funding (Zomer and Benneworth 2011; Watermeyer 2014a; Lockett et al. 2015).

These changes and influences in higher education have led to the growth of knowledge exchange practitioners employed in KEOs. Some 12,500

practitioners in the UK, acting as an interface between academics, business, and other stakeholders, both internal and external, work in industry and the public sector, including KEOs (Institute of Knowledge Transfer (IKT) 2010). These knowledge exchange practitioners are supported by professional networks such as AURIL PraxisUnico and the Institute of Knowledge Transfer (IKT).

1.2.2 CSR and KEOs

Most studies of CSR focus on business rather than higher education, or not for profit organisations, government and governmental agencies (Mehta 2011); little research has explored connections between KEOs and CSR (Nadeem and Kakakhel 2012). CSR applies just as much to KEOs as it does to business and other organisations, such as charities (Ludescher et al. 2012). When writers ask *"What relationships exist between public responsibility and the ethical values of a company's employees and its society?"* (Wood 1991, p.702), similar questions can be asked of KEOs (Tetřevová and Sabolová 2010b).

Stakeholder theory has become a key theme in CSR research since Freeman introduced the concept in 1984 (Carroll 1999). While stakeholder theory has focused on business, it applies to other sectors, including KEOs, charities and the public sector. Regardless of the legal form of an organisation and the purpose or cause for which it was established, its decision-makers need to manage the organisation for the benefit of its stakeholders who are essential to its success and long-term survival (Gibson 2000; Hasnas 2013). As the role of KEOs has changed, they have started to look at how they can develop and influence relationships with their stakeholders (Jongbloed et al. 2008; Tetřevová and Sabolová 2010a).

1.2.3   Knowledge exchange, CSR and ethics

There is much debate today about the role of CSR in business, including ethics, sustainability, and environmental issues. Some writers approach CSR from an ethical perspective and classify approaches to CSR according to ethical theories, using CSR as a bridge between business, values and ethics; CSR can offer a

way of linking business ethics and organisations' social responsibilities (Carroll and Shabana 2010; Ehasz and Lan 2011).

Although universities have spent much time ensuring that research ethics are managed effectively and much had been written on this, there is little in the literature about the ethics of knowledge exchange. In trying to define the ethics of knowledge exchange, some scholars have considered how the concept of values could offer some insights, as from one perspective they can be viewed as ethical norms (Hemingway 2005). Some other management functions are ahead of knowledge exchange; some researchers have looked to derive ethical principles by looking at how these are addressed in areas such as information technology, accounting and marketing (Baker 2009); other professions are questioning their ethical approaches; for example, the Institute of Business Ethics published a guide to "responsible marketing" in 2009 (Baker 2009). These kinds of concepts and approaches tend not to have been applied to knowledge exchange or KEOs more generally.

In parallel with the changes in the roles and expectations of KEOs, there are ever growing pressures on them to place social and environmental issues alongside their aims of making surpluses and securing financial returns, to behave in socially responsible ways. CSR means different things to different organisations; many universities see it as being more to do with going green, being environmentally friendly. The universities' main funding agency, HEFCE, seems to think so as well. HEFCE has encouraged universities to take up CSR, focusing on sustainability and environmental issues (Higher Education Funding Council for England (HEFCE) 2011a). Many universities have not integrated CSR with their main activities of research, teaching and knowledge exchange (Higher Education Funding Council for England (HEFCE) 2011b).

The way knowledge exchange is undertaken reflects the ethos and values of the knowledge exchange sector, as well as those of KEOs and individuals involved in knowledge exchange. Knowledge exchange practitioners work on the boundaries of their KEOs, and are responsible for developing and sustaining multi-faceted relationships with a wide range of organisations and stakeholders. They are influenced by the culture, ethos and values of their KEOs, their

professional context and broader societal developments. The personal values of knowledge exchange practitioners also influence why they are involved in and how they undertake knowledge exchange.

Government has given KEOs a critical role in defining who owns and benefits from knowledge exchange. With the support of public funding and Governmental endorsement, KEOs have become suppliers of key economic resources, knowledge and intellectual capital, to business. KEO stakeholders seem to have little say or influence in this. KEOs have yet to consider how they can address underlying ethical issues of knowledge exchange activities. Little research has been done to explore ethical issues that arise for KEOs and knowledge exchange practitioners involved, and on the kind of ethical questions that they can encounter; connections between knowledge exchange, CSR and business ethics have not been explored. This study aims to do this.

1.2.4   Ethical boundaries in knowledge exchange

Attempts have been made to develop an ethical framework for higher education at an organisational level, such as the Missenden Code (2002) and the initiative undertaken by the Council for Industry and Higher Education (Council for Industry and Higher Education (CIHE) 2005). In some cases, knowledge exchange activities have societal and environmental benefits as well as business objectives. The ethics and moral boundaries of knowledge exchange are mostly unexplored; these range from CSR to sustainability, human rights, professionalism, governance, conduct, norms and values. In looking to compensate for cuts in their public funding by trying to generate income by exploiting their knowledge and intellectual capital, KEOs are starting to mix commercial gain with their charitable objectives. As KEOs are looking to demonstrate their relevance and usefulness to society, they need to consider how they can do so in a way that does not compromise their role. So just as businesses are asserting claims to social relevance and proclaiming their commitment to CSR, KEOs are competing with them to prove their worth and relevance to society.

In some ways KEOs are several steps ahead of business. They have long addressed the question of ethics in their teaching and research, and so have ways of behaving and thinking that permeate their activities in these areas. However, they are more reticent in doing so in their third mission and knowledge exchange activities. This holds true even in those areas where KEOs are looking to use and exploit their knowledge and research for either social or economic good or benefit. Even in KEOs where knowledge exchange is integrated with their research and teaching activities, questions of ethics and social responsibility are not addressed openly. So in some ways, business has stolen a march on KEOs. Many business sectors and companies proclaim proudly and openly about how they benefit society through their CSR activities. KEOs have something to learn.

Research into knowledge exchange seems to be fragmented across a range of disciplines. While much of the literature focuses on threats to academic values and freedom, little theory or practical recommendations have been developed about addressing and managing the potential ethical issues which can arise in knowledge exchange (Kenney 1987; Fassin 2000). The issues that arise from and underpin knowledge exchange need to be understood and their impact assessed in economic, social, and cultural terms. Doing so would help to inform the future shape and direction of knowledge exchange. Such an approach would also support relationships and interactions among knowledge exchange "actors" and stakeholders, including the Government and business.

The concepts and underlying philosophy that implicitly underpin knowledge exchange and the rationale for them have yet to be fully explored. Different approaches to ethics and various perspectives offered by business ethics and CSR may be able to offer fresh insights for knowledge exchange. There is a gap in how CSR and business ethics are addressed in knowledge exchange. So this thesis explores possible links between these three areas, which form the concept of "Responsible Knowledge Exchange".

The issue of how higher education interacts and collaborates with its stakeholders, including business, is a significant issue. KEOs have policies and processes for handling ethics, especially in the area of research; however, these

policies are not always visible in knowledge exchange. There is confusion about whether KEOs undertake knowledge exchange for the public good or to generate additional income. The rationale for undertaking knowledge exchange is seen to be for public good rather that includes social and economic benefit, rather than solely financial return for KEOs. The debate on the "impact" of publicly funded research has tended to reinforce this. This sparked a furious debate in academia as the pages of Times Higher Education witnessed and was perceived as undermining academic ideals and values further (James 2009; Ladyman 2009; Luck 2009). The public sees KEOs as places where truth and knowledge are pursued for their own sake, and that academics behave "ethically" as evident by the concern about research ethics. In summarising the position for universities, HEFCE has summarised the position about universities, and this can be said to apply to KEOs as a whole:

> *"Universities benefit from public money and reductions in tax from their charitable status, and all these are premised around the university acting for the broad public good. This may include working with the private sector, but this must be in a thoughtful way that balances various public interests and long-term goods."* (Frost 2015)

1.3   Conceptual Framework

Figure 1.1 gives an overview of the concept of Responsible Knowledge Exchange. This is shown in the shaded part in the middle of Figure 1.1 where the areas of knowledge exchange, CSR and business ethics intersect and overlap. This is the space which this study seeks to explore.

Figure 1.1 Overview of Responsible Knowledge Exchange

A more detailed framework, which is derived from concepts found in the Literature Review (Chapter 2), is set out in Figure 1.2. This seeks to capture Responsible Knowledge Exchange and its constituent elements within a broader context.

Although KEOs are large and complex organisations with different structures and ethos (Martin and Turner 2010), they are all involved in knowledge exchange. Knowledge exchange practitioners are the focus of this study and they tend to share a similar professional outlook. So for the purposes of Figure 1.2, their KEOs are grouped together as a homogeneous group. Knowledge exchange is envisaged as a series of activities or a process where KEOs, which have different roles and social responsibilities, undertake knowledge exchange by engaging with stakeholders. In doing so, KEOs encounter ethical issues, and have to negotiate and manage ethical boundaries and issues using values, and checks and balances.

The conceptual framework in Figure 1.2 provides a starting point for the qualitative research design and data collection (Section 3.4, pp.48-49 and Section 3.8.1, pp.55-56), the research findings (Chapters 4 and 5) and the

discussion (Chapters 6 and 7) (Wolcott 1994, p.33). The research explores these concepts as elements of Responsible Knowledge Exchange by appraising the relationships among them and considering how they interact.
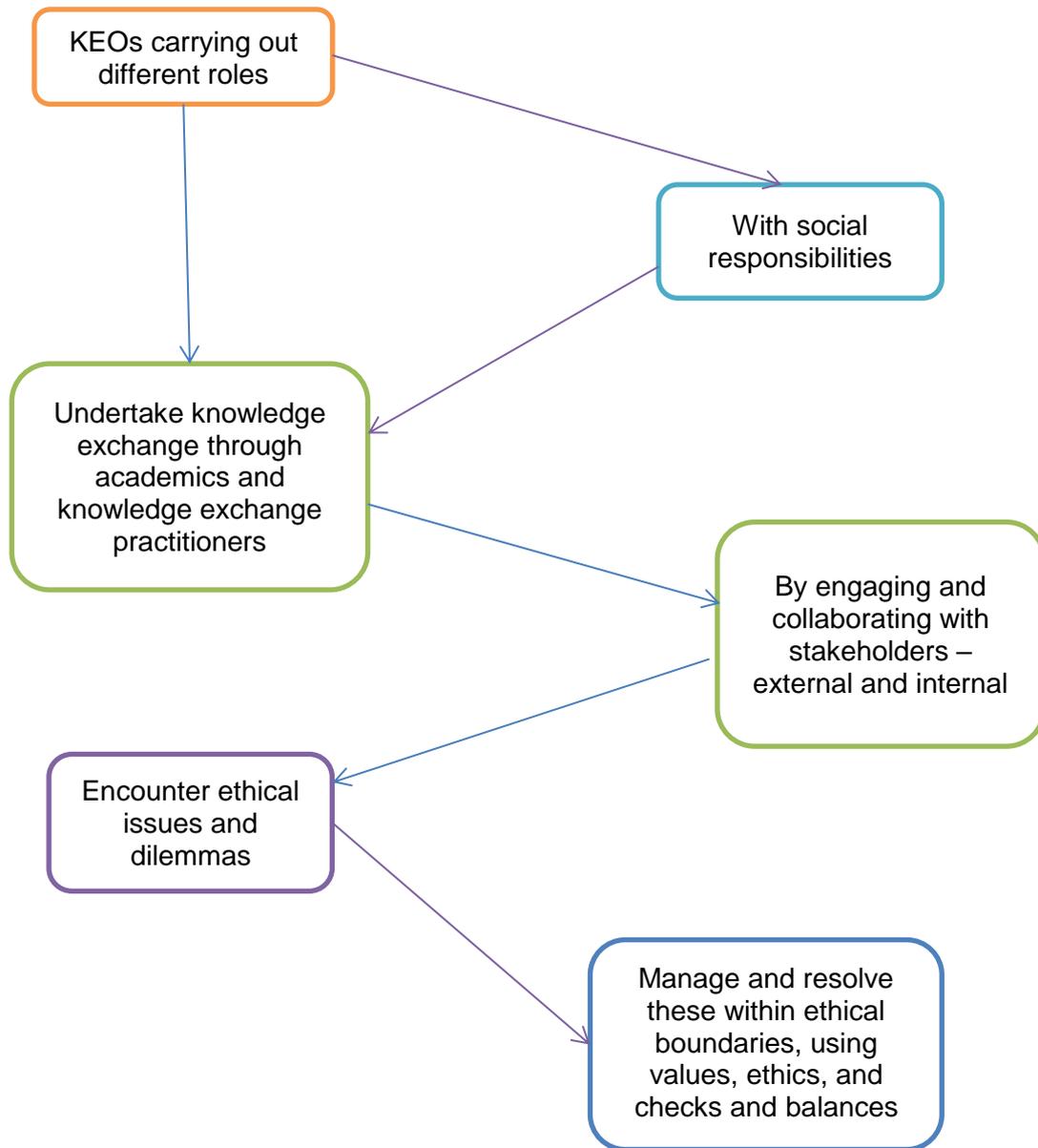
Figure 1.2 Conceptual Framework - Responsible Knowledge Exchange

1.4 Research strategy and objectives

The overall aim of this research is to explore the concept and dimensions of Responsible Knowledge Exchange by investigating interconnections and interactions between knowledge exchange, CSR and business ethics.

To achieve this overall research aim, the research has following objectives and questions. These are set out in Table 1.1.

Research Objectives	Research Questions
Define and delineate the principles and key elements of Responsible Knowledge Exchange, their relationships and interactions	What are the scope of and rationale for knowledge exchange?
Determine how CSR is practised and applied in knowledge exchange	How is CSR applied and practised in knowledge exchange?
Explore the ethical boundaries and values of knowledge exchange	What are the ethical boundaries and underpinning values of knowledge exchange?

Table 1.1 Research Objectives and Questions

The focus of the research is the knowledge exchange practitioner representing their KEO in their professional capacity. The research seeks to capture and explore the views of professional knowledge exchange practitioners in three areas; their perceptions and understanding of knowledge exchange, its underlying values and ethics, and its possible connections with CSR. The research was undertaken through an exploratory pragmatic qualitative study which sought to focus on learning the meaning, understanding and perceptions that the research participants held about the issues being discussed (Creswell 2007, p.40). The population comprised the supply side of knowledge exchange as represented by KEOs, including funders, policy makers and advisors. The sample of 37 interviewees comprised a mix of knowledge exchange practitioners from publicly funded universities and PSREs, including funders and policy makers. Given their preponderance among KEOs in the public sector, universities formed the majority of the sample. The data was analysed using a priori codes derived from the interview questions (Saldana 2009, p.49) using Computer Assisted Qualitative Data Analysis Software (CAQDAS).

1.5 Significance of the study

With changes in the roles of KEOs, academic, teaching and research ethics have been developed and are governed closely, and rightly so. This research seeks to contribute in three areas: for KEOs and funders, for knowledge exchange networks and knowledge exchange practitioners. Previous studies have

considered the position of knowledge exchange as one of the roles of KEOs (Slaughter and Leslie 1997; Geuna and Muscio 2009; Nelles and Vorley 2010) and as an element of entrepreneurial KEOs (Martin and Turner 2010; Etzkowitz 2014; Mendoza 2014). However, with the emergence of knowledge exchange, the ethics of KEOs and academics engaged in sharing knowledge with the outside world seem to have been overlooked. With some exceptions (Jongbloed et al. 2008; Esfijani et al. 2013), there has been little research on possible connections between knowledge exchange, CSR, and ethics.

The research considers the roles of KEOs, and their relationship to knowledge exchange as this provides the background and context in which knowledge exchange sits. Exploring different aspects of KEOs' roles raises issues about the rationale for their undertaking knowledge exchange, how these relate to KEOs' social responsibilities and their relationships with their stakeholders. The study explores different approaches to and ways of understanding knowledge exchange and perspectives on it, so that the ethical issues can be considered within their context. This research explores the relevance of social responsibility to KEOs, particularly knowledge exchange (Rodríguez Bolívar et al. 2015). The research explores how KEOs approach managing their stakeholders, and the ways in which and the criteria they use in relating to their stakeholders and potential collaborators.

Although academic values and ethics are explored extensively in the literature, (Kelley et al. 2005; Kelley and Chang 2007; Anderson et al. 2010; Lam 2010), ethical issues in knowledge exchange have not been explored extensively. The research seeks to find an appropriate starting point to define knowledge exchange ethics and values and whether academic values and culture can contribute to them. This research explores some of the kind of ethical issues that can arise in knowledge exchange and the ethical issues which concern knowledge exchange practitioners. The thesis explores how knowledge exchange practitioners identify and address ethical issues in knowledge exchange.

The research reveals a need to recognise the existence of ethical issues in knowledge exchange, a requirement to manage them and to find ways to support

knowledge exchange practitioners in doing so. This research provides encouragement for KEOs and their funders in three ways: to consider the kinds of mechanisms they could use to govern ethics in knowledge exchange; to consider the kind of guidance they could provide to make explicit their ethics and values of knowledge exchange; and how to differentiate the ethics of knowledge exchange from research ethics.

Using the concept of Responsible Knowledge Exchange to define the space where knowledge exchange, CSR and ethics combine and coalesce could prompt KEOs, knowledge exchange professional networks, such as AURIL and PraxisUnico, and knowledge exchange practitioners to develop more ways and ideas to identify and manage ethical issues in knowledge exchange. By raising awareness and, promoting discussion about the kinds of ethical issues and concerns that can arise in knowledge exchange, the research may encourage the development of best practice in these areas. These steps may, in turn, build on this research by helping to refine the parameters in which knowledge exchange practitioners can operate ethically and responsibly. Increasing awareness about ethical predicaments and issues which can arise in knowledge exchange can contribute to the further development of an ethical culture in knowledge exchange.

1.6 Structure of the thesis

This thesis consists of eight chapters. The literature review in Chapter 2 (Defining the Research Territory) explores what has been written about knowledge exchange, KEOs' roles, CSR, stakeholders and ethical implications. Chapter 3 (Research Methodology) explains the research methodology and research methods and describes the methods used to select the sample, how the fieldwork was undertaken, how the data was collected, analysed, and interpreted and the steps taken to ensure the reliability and validity of the data. In Chapter 4 (KEOs engaging with the world: Research Findings I) the main findings arising from KEO engaging with external organisations are described and in Chapter 5 (Ethos of Knowledge Exchange: Research Findings II) considers the research findings on the ethos of KEOs in relation to knowledge exchange. In Chapter 6 (Elements of Responsible Knowledge Exchange I), the implications of the

research findings in the light of the literature are discussed in three areas: the scope and rationale of knowledge exchange, roles and perceptions of KEOs and engagement. In Chapter 7 (Elements of Responsible Knowledge Exchange II), the implications of the research findings on CSR in KEOs and the ethos of knowledge exchange are explored in the light of the literature. Finally in Chapter 8 (Conclusion), the emerging understanding of Responsible Knowledge Exchange is considered. It considers the extent to which the research questions have been answered, some implications of the contribution to knowledge, policy and practice, addresses the limitations of the study and suggests some potentially fruitful areas for further investigation.

Chapter 2:   Defining the Research Territory

2.1 Introduction

In this chapter, the components of Responsible Knowledge Exchange are considered from other scholars' points of view. A literature review is undertaken to explore the research territory of the three main elements of Responsible Knowledge Exchange: knowledge exchange, CSR, and ethical boundaries. These are set out in the conceptual framework in Figure 1.1 (Section 1.3, p.9).

This chapter is explores five main areas. The chapter starts by looking at the scope of knowledge exchange, and the rationale for undertaking it. This leads to an exploration of the changing role of KEOs and how the emergence of knowledge exchange has affected them. Then the concept of CSR, its application in KEOs, and its interconnection with stakeholder management are considered. The exploration of CSR is followed by considering how ethics and ethical boundaries interact with knowledge exchange. Finally, the themes and issues that emerge from the literature review are summarised, gaps in the literature are identified, and how this research will contribute toward filling these gaps are addressed.

2.2 Knowledge exchange

This section explores the first main concept of Responsible Knowledge Exchange by considering the breadth of knowledge exchange, and the role of knowledge exchange practitioners.

2.2.1 Defining knowledge exchange

Creating, disseminating, and producing "knowledge" is at the heart of what KEOs are about (Kogut and Zander 1992, p.3; Chambers and Gopaul 2010). Knowledge is generated through teaching, research, development of individual and collective know-how and experience, and codifying knowledge into tangible results such as publications and patents (PACEC and the Centre for Business Research 2010b). When knowledge is captured or codified in patents and documents, the originator creates a "knowledge product" or an asset that can be

traded in exchange for value (Powell and Snellman 2004; Howard 2005; Antonelli 2008). As developing and disseminating knowledge is KEOs' main purpose, the "capitalisation" of knowledge means that KEOs can trade and exchange knowledge as an economic good in a market transaction (Howard 2005).

In this sense, knowledge exchange can be seen as a production process where KEOs produce knowledge, or "knowledge products" (Howard 2005). "Knowledge production" reflects the conventional view of knowledge exchange where KEOs exploit research results as codified knowledge or intellectual property (Howard 2005); it is one element of knowledge exchange and these components are summarised in Table 2.1 below.

Approaches to understanding knowledge exchange	
Knowledge production	Selling "knowledge products" embodied in codified or explicit knowledge or intellectual property
Knowledge diffusion	Encouraging business to adopt results of research and focuses on communication
Knowledge relationships	Providing services to businesses based more on tacit knowledge such as trade secrets, expertise and know-how and other forms of tacit knowledge. Focuses on collaboration
Knowledge engagement	An outcome of the convergence of science, society, KEOs and government

Table 2.1 Approaches to understanding knowledge exchange Adapted from Table 4 - Process models for knowledge transfer (Howard 2005, p.21).

As Table 2.1 shows, Howard (2005) goes further by defining various elements of knowledge exchange, such as "knowledge diffusion" and "knowledge relationships" (Howard 2005, p.21). "Knowledge engagement" echoes other approaches to understanding the changing roles of KEOs, such as the triple helix (which is discussed in Section 2.3.4). The approaches illustrated in Table 2.1 show how knowledge exchange can be understood as a dynamic flow of ideas which benefit the parties; mutual sharing knowledge and ideas between KEOs and different parts of society, including the public and charity sectors, as well as business (Francis-Smythe et al. 2006; Knight and Lightowler 2010).

Knowledge exchange can be seen as relationships between KEOs and business which support the exchange of knowledge and technology (Howard 2005, p.21; Ankrah and Omar 2015). For policy-makers or funders, knowledge exchange in

the sense of "knowledge diffusion" means creating awareness of the benefits of adopting new business practices, processes and procedures and seeking to change behaviour. This means building capacity to undertake knowledge exchange, increasing the knowledge, skills, and capabilities of organisations and business to adopt and use new technologies (Howard 2005, p.32). So for funders, knowledge exchange "*describes how knowledge and ideas move between the knowledge source to the potential users of that knowledge*" (Research Councils UK (RCUK) 2007, pp.2-3), previously endorsed in Parliament (Science and Technology Committee 2005-06). Lockett et al (2008) argue that "*the process of knowledge creation and exploitation takes place in the context of broader society.*" For them, knowledge exchange embraces a range of "knowledge activities", that includes knowledge transfer, "knowledge creation", "knowledge adoption" (commercialisation by industry or use by policymakers) and "knowledge exploitation" that encompasses knowledge transfer and knowledge adoption (Lockett et al. 2008). Knowledge exchange practitioners see knowledge exchange as "*the systems and processes by which knowledge, including technology, know-how, expertise and skills, is transferred from one party to another leading to innovative, profitable or economic and social improvement*", the definition used by the IKT (Institute of Knowledge Transfer (IKT) 2010). A broad definition of knowledge exchange implies that it is a mutual sharing of knowledge among two or more parties, where research users learn from each other (Knight and Lightowler 2010; Fazey et al. 2013). However, to understand the elements of knowledge exchange, this definition of knowledge exchange needs to be analysed in more detail by considering the breadth of knowledge exchange.

2.2.2 The range of knowledge exchange

Although knowledge exchange is usually associated with collaboration between KEOs and business (Ankrah and Omar 2015), it is much broader than this and includes cultural and community development (Labory et al. 2015; Sheridan and Fallon 2015). One scholar has gone further by distinguishing between knowledge exchange for social and environmental benefit, and knowledge

exchange for commercial benefit (PhillipsKPA 2006, p.vi). In doing so, this reflects a broader base for and range of knowledge exchange activities.

Knowledge exchange activities can be categorised in different ways, from a functional perspective (Lockett et al. 2008), as interactions (Abreu 2009), or simply as knowledge exchange activities (PACEC and the Centre for Business Research, University of Cambridge 2009a). Other scholars take similar approaches. Abreu (2009) argues that interactions between academics and external organisations can be grouped in four categories according to the nature of the activity: people-based, problem solving, community based and commercialisation activities (Abreu 2009; Hughes et al. 2011; Hughes and Kitson 2012). PACEC uses five categories: research translation, developing people and skills, stimulating interactions, exploiting KEO' assets and civic interactions (PACEC and the Centre for Business Research 2009b). This was later revised and expanded to six categories: skills and human capital development, facilitating research exploitation, knowledge sharing and diffusion, exploiting KEOs' physical assets, social enterprise and entrepreneurship and supporting the community and public engagement (PACEC and the Centre for Business Research 2011; Gilman and Serbanica 2015).

Funders and policy makers such as HEFCE and the Government use similar classifications in their annual survey of knowledge exchange activities in universities and PSREs (Department for Business Innovation & Skills 2009a; Higher Education Funding Council for England (HEFCE) 2014). HEFCE's annual review of knowledge exchange activities in universities (Higher Education – Business and Community Interaction survey - HEBCI) identifies seven kinds of knowledge exchange activities: collaborative research, consultancy, contract research, continuing professional development and continuing education, facilities and equipment related services, intellectual property and regeneration and redevelopment programmes (Higher Education Funding Council for England (HEFCE) 2014). A simpler approach is to combine the groupings used in HEBCI 2006-07 to come up with three classifications: technology transfer, business support and regeneration and economic development (Decter et al. 2010).

Other perspectives can be used to understand the breadth of knowledge exchange. In using "entrepreneurship" as a synonym for knowledge exchange, some scholars see knowledge exchange as part of an entrepreneurial university, (which is explored in Section 2.3.3) and identifies nine elements (Philpott et al. 2011). According to them, knowledge exchange comprises creating technology parks, spin-out companies, patenting and licensing, contract research, industry training courses, CPD (continuing professional development), consultancy, "grantsmanship" (obtaining large research grants from external funders), academic publication and producing highly trained graduates (Philpott et al. 2011).

While "commercialisation" activities suffered from a poor image in the UK, particularly when compared with the US, progress has been made since the 1990s (Minshall et al. 2008, p.186). Literature on knowledge exchange has tended to emphasise science, technology, engineering and mathematics (STEM) and to pay little attention to knowledge exchange between KEOs, and the public and third sectors, the community (Benneworth and Jongbloed 2010; Hughes et al. 2011; Hughes and Kitson 2012), and in the arts, humanities and social sciences (Benneworth and Jongbloed 2010; PACEC and the Centre for Business Research 2010a).

2.2.3 Knowledge exchange practitioners

Literature about knowledge exchange has tended to focus on STEM, stressing "hard" aspects of knowledge exchange such as technology transfer (patents, licensing and setting up spin-out companies. Scholarly literature does not encompass the broad scope and wide range of knowledge exchange activities (D'Este and Patel 2007; Decter et al. 2010; Mircea-Iosif 2013), or the broad roles of knowledge exchange practitioners.

Much of the literature focuses on the involvement of academics in knowledge exchange. In many KEOs academics are supported by knowledge exchange practitioners, whose numbers have grown since 2000. By 2005, approximately 4,000 full time equivalent staff were involved in managing knowledge exchange activities in UK universities (Perkmann and Walsh 2007), and their numbers have

continued to grow since then (Institute of Knowledge Transfer (IKT) 2010). "Knowledge exchange practitioners" cover a broad spectrum of roles, ranging from practitioners working alongside policy makers and funders, in the charitable sector as well as KEOs (Knight and Lightowler 2010). Some practitioners combine their responsibilities with other academic or professional roles (Knight and Lightowler 2010). Knowledge exchange practitioners are organisational agents (Howells 2006; Yusuf 2008); they act as intermediaries or boundary spanners, providing an interface between academics, business, and other stakeholders (Howells 2006; Yusuf 2008; Johnston et al. 2010). As gatekeepers, their role involves establishing and using networks, and translating and interpreting the different cultures and language of KEOs and business (Cranefield and Yoong 2007). The lack of a clear definition of a knowledge exchange practitioner is a theme in the literature (Howells 2006; Yusuf 2008; Knight and Lightowler 2010). Regardless of how they are described, knowledge exchange practitioners are critical to successful knowledge exchange (Cranefield and Yoong 2007).

Defining the scope of knowledge exchange and the role of knowledge exchange practitioners leads on to considering the broader role of KEOs and the position of knowledge exchange within them. This is the focus of the next section.

2.3 Role of KEOs

2.3.1 Defining knowledge exchange organisations

As described in Section 1.3 (p.9), for the purpose of this thesis, universities and PSREs are grouped together as knowledge exchange organisations (KEOs). KEOs comprise universities and *"all types of public research organizations, including those primarily funded by the government. This may include public research laboratories, research institutes, and other non-profit or for-profit research organizations"* (Perkmann and West 2012). These include PSREs, research councils, Innovate UK, and other organisations which are involved in knowledge exchange in some way. KEOs form part of the "knowledge infrastructure" in the UK (Smith 2015).

Here "publicly funded" means those universities and PSREs which are designated as "contracting authorities" under the Public Sector Procurement Regulations 2006 (HM Government 2006; Calder 2012). In addition, "publicly funded" universities are those which receive funding from HEFCE (Morgan 2015a).

Publicly funded universities comprise a mix of pre-1992 and post-1992 universities. "Pre-1992 universities" are those universities which were established in the 1960s and earlier (Mahamed 2012). "Post-1992 universities" refer to higher education bodies such as former-polytechnics and other higher education institutions which were funded by local authorities and were designated as universities under the Further and Higher Education Act 1992 (Mahamed 2012; Tookey 2013; Lockett et al. 2015). Lockett et al (2015) observe how the designation of pre-1992 and post-1992 universities is reflected in their membership of professional associations for knowledge exchange practitioners. Pre-1992 universities tend to be members of PraxisUNICO, while AURIL, which has a broader membership, tends to include more post-1992 universities (Lockett et al. 2015). As universities are the predominant kind of KEO, they are the focus of the remainder of this section.

2.3.2 Evolving role of universities

Government support of knowledge exchange in KEOs has led to debate about the changing role and apparent commercialisation of universities, and the undermining of academic values and scientific norms (Tasker and Packham 1994). The growth of knowledge exchange has formed part of a change in universities which is acknowledged officially (Department for Business Innovation & Skills 2009b). Increasing interaction between universities and industry is seen as introducing business values into higher education. It is also reflected in the changing nature of the relationship between KEOs, industry and government as universities are pressurised to become more entrepreneurial (Johnston et al. 2010).

In the past universities were seen as places of studying and learning. Two models of universities evolved in the nineteenth century. Cardinal Newman's

model of a community of scholars pursuing knowledge for its own sake, the "classical model" developed in parallel with the Humboldt university in Germany. This was the technical university or vocational model generating useful knowledge for societal benefit and trained skilled graduates ready to enter the workforce (Minshall et al. 2008). Since about 1850, universities have also both influenced and been changed by industry in its research and teaching, often in response to macro-economic factors, particularly in the UK (Sanderson 1972; Sanderson 1975; Geuna and Muscio 2009). Industry has come to rely on higher education as a source of effort, skills, technology and innovation (Sanderson 1972).

The traditional role of KEOs has been to discover, develop and share knowledge in the public domain with academics having freedom to engage in research and teaching freely and openly, and to criticise and challenge (Lieberwitz 2006; Kok et al. 2010). The concept of the "research university" emerged after World War II when the Government invested significantly in research in KEOs, particularly in STEM (Barnett 2011). KEOs received public funding for research in return for creating knowledge that benefitted society (Jacobson et al. 2004; Dan 2013). The focus on research in KEOs led to the myth of the ivory tower, and the boffin pursuing knowledge for its own sake (Barnett 2011). Research in KEOs was seen as a way to support teaching, and then became an end in itself. Two reports have been criticised for failing to recognise universities as "communities of scholars" (Fearn 2010): the Browne Report (2010), which reviewed higher education funding tended to emphasise KEOs' broader roles rather than their traditional roles of research and teaching (Browne 2010), and the Hunt Review in Ireland (Hunt 2011).

2.3.3 Third mission and entrepreneurial universities

The rise of knowledge exchange in universities forms part of institutions' response to changes in their mission and role in society as well as changes in societal expectations (Zomer and Benneworth 2011). The emergence of knowledge exchange has to be considered in a broader context of recognising that knowledge generated in KEOs is seen as an economic driver, which is combined with growing demand for more skilled graduates in the workforce, and

significant growth in student numbers (Geuna and Muscio 2009). Knowledge exchange is included in "third mission" or "third stream" activities of universities alongside teaching and research. "Third mission activities" tend to mean all KEO activities, excluding research and teaching, which contribute to social and economic development (Jongbloed et al. 2008; Rossi 2010), or to commercialising and exploiting research (Shore and McLauchlan 2012; Gilman and Serbanica 2015; Lockett et al. 2015).

Some researchers claim that the most widely cited definition of what third mission activities is: "... *those that are 'concerned with the generation, use, application and exploitation of knowledge and other university capabilities outside academic environments'*" (Molas-Gallart et al. 2002, pp.iii-iv; Shore and McLauchlan 2012, p.268; Sheridan and Fallon 2015). Molas-Gallart et al (2002)'s definition of "third mission" focuses on KEOs using their knowledge in different ways, not necessarily to create social or economic benefit (Molas-Gallart et al. 2002). In comparison, Zomer and Benneworth see KEOs' "third mission" of KEOs as "*social, enterprising and innovation activities that universities carry out alongside their teaching and research activities whereby additional benefits are created for society*" (Zomer and Benneworth 2011, p.82). Zomer and Benneworth (2011)'s definition includes KEOs' social as well as their knowledge exchange activities and sees third mission activities as creating added value for society (Zomer and Benneworth 2011). Other scholars confirm that "third mission" refers to KEOs' social and economic roles (Nelles and Vorley 2010).

Like the changes which have taken place in PSREs, universities have shown the importance of their contribution to regional economic development and the significance of their relationships with government and business (D'Amico, Abbate et al. 2012). Clark's approach, where he identifies five features of entrepreneurial KEOs, has become the starting point (Bronstein and Reihlen 2014). Although definitions vary (Martin and Turner 2010), "entrepreneurial KEO" is now understood to mean KEOs undertaking knowledge exchange, securing more external income by diversifying their sources of funding, competing for students and finance, supporting economic development and growth regionally

and nationally, and changing research priorities (Rinne and Koivula 2005; Baldini 2006). Some scholars refer to "entrepreneurial KEOs" rather than to "third mission" (Baldini 2006). The term "entrepreneurial KEOs" seems to have wider implications and embraces the broader structural and cultural implications for KEOs' mission (Thorp and Goldstein 2010). An "entrepreneurial KEO" is a KEO which tries to incorporate a business culture with a public interest ethos (Parker 2011).

The rationale for undertaking knowledge exchange is sometimes uncertain. For KEOs and academics, knowledge exchange provides a way to share the results of their teaching and research. Knowledge exchange offers a way for KEOs to apply the results of their research and to take their ideas into the public domain; it provides a means of demonstrating how investment in research benefits society. For KEOs the possibility of increasing revenue is encouraging them to greater involvement with business. For the Government, knowledge exchange is the return for public investment in research across all disciplines (PhillipsKPA 2006, p.vii; Shore and McLauchlan 2012; Lockett et al. 2015).

2.3.4 Approaches to understanding universities' changing roles

Scholars have developed different models which try to understand the changing roles of universities, how knowledge is created and how entrepreneurial universities have developed. Tuunainen (2005) compares the three main approaches that attempt to describe the changing role of the university and how knowledge is produced: "academic capitalism" (Slaughter and Leslie 1997), the "triple helix" (Etzkowitz 2014) and Gibbon's model of "Mode 1 and Mode 2 knowledge" (Tuunainen 2005; Mendoza 2014).

"Academic capitalism" stresses the introduction of business values into higher education (Tasker and Packham 1994), and the transformation of universities so that they are becoming like other major business organisations (Slaughter and Leslie 1997; Tuunainen 2005), also known as "corporatism". This is the "capitalisation of knowledge" or "the triple helix" where universities, government and industry are interlinked in the development, dissemination and exchange of knowledge (Etzkowitz et al. 2000; Redford and Fayolle 2014). Slaughter and

Leslie (1997) conceptualise the shift as moving US universities from undertaking research and teaching for the broader public good to acting as corporate businesses seeking to exploit their main output, knowledge, for their own ends and benefits. This involves a shift from a focus on values to consumer benefits (Slaughter and Leslie 1997; Kumar 2010; Zheng 2010). Crespo and Dridi (2007), however, argue that both regimes exist in universities (Crespo and Dridi 2007).

Some authors compare Etzkowitz's and Slaughter's theories with other approaches such as changes in the nature of research. Pure research, which is disciplined focused and governed by peer review ("Mode 1"), is shifting to applied, interdisciplinary problem solving research ("Mode 2") (Fassin 1991; Paz Salmador et al. 2007; Hessels and Van Lente 2008). Some scholars question Etzkowitz's and Slaughter's attempts to reflect changes in the role of universities from a more strategic perspective (Hessels and Van Lente 2008). Other scholars question whether Etzkowitz's theory of the "entrepreneurial university" and the triple helix model is happening in the way and on the scale that Etzkowitz asserts; they question whether a "one size fits all" approach can encompass the wide range of different kinds of universities (Philpott et al. 2011). Some scholars conclude that theories such as the triple helix and academic capitalism do not really explain the changing role of universities; models such as these tend to focus on one organisation or convenient rather than representative samples, and one set of actors, rather than considering the multiple interactions involving overlapping sets of actors (Tuunainen 2005; Nelles and Vorley 2010; Mendoza 2014). On the other hand, other scholars argue that the literature on the entrepreneurial university offers more insights, that studies are based on empirical research, and focus on how the structure and culture of KEOs have adapted to the changes (Nelles and Vorley 2010). Other studies have focused on "academic entrepreneurship" and the development of entrepreneurial skills among academics (D'Este et al. 2012).

Academic capitalism is often characterised as the increasingly dominant character or "logic" of the KEOs (Mars 2009). Here "KEO logic" or institutional logic refers to the "*the socially constructed, historical pattern of material practices, assumptions, values, beliefs and rules by which individuals produce*

and reproduce their material subsistence, organize time and space, and provide meaning to their social reality" (Sauermann and Stephan 2013, p.890; Canhilal and Lepori 2014, p.4). Although it can be difficult to identify institutional logics, they can be seen in organisational structures, management practices and decision-making (Sauermann and Stephan 2013). Institutional logics summarise the prevailing features of organisations (Sauermann and Stephan 2013). Institutional logics influence organisational behaviour and actors' decision-making and behaviour (Mars 2009).

KEOs' dominant features seem to be academic and managerial logics (Canhilal and Lepori 2014). With the emergence of the entrepreneurial KEO and third mission, KEOs have been experiencing conflicting institutional logics, between KEOs' traditional role of contributing to the public good and focusing on research and teaching, and, at the same time, moving towards increased "corporatisation", and academic capitalism (Geschwind and Karlsson 2014; Vilkas and Katiliute 2014). Berman (2012) observes how "science logic", which has been prevalent since World War II, has come into conflict with "market logic". "Market logic" or academic capitalism has increased significantly in US universities, as evidenced by the growth in KEO patenting and collaboration with business (Mars 2009; Berman 2012). Market logic echoes the changes in KEO-government relationships, Etzkowitz's triple helix, and moves from pure to applied research (Mars 2009). Academic logic is based on academic norms of collegiality, Mertonian norms, with decisions made collectively based on academic values. In contrast, managerial or market logic is centralised and hierarchical based on formal rationality or managerialism (Sauermann and Stephan 2013; Canhilal and Lepori 2014; Mampaey and Huisman 2015).

Managerialism reflects the approach to government reform of the public sector, including higher education, which has been dominant since the 1980s. It involves applying private sector management practices to the public sector (Shattock 2008; Miller 2014); the focus is on efficiency and effectiveness, accountability and performance measures (Deem and Brehony 2005; Lynch 2015). It is reflected in KEOs using business language and practices (Deem and Brehony 2005). Market logic in KEOs has led to demands for increased accountability, monitoring, and

more recently, impact and REF (Watermeyer 2014a). "Corporatism" and the emergence of the third mission have changed the role and shape of KEOs (Lynch 2015).

Scholars distinguish between "institutions" and "organisations": *"… institutions set the rule and define the way the game is played whereas organisations are the players….* [Organisations] *"are groups of individuals bound by some common purpose to achieve objectives"* (Veciana and Urbano 2008, p.368). Like institutional logic, institutional theory has been used to explore and understand how institutions originate, develop and survive (Micelotta 2014; Lockett et al. 2015), and to explore the meanings incorporated in organisational practices, rules, norms, and procedures (Scott 2008; Geschwind and Karlsson 2014). For KEOs, institutional theory offers a way to explore and understand differences between KEOs as institutions and the influence of social, economic and other changes in their external environment on their structures and logics (Silver 1982; Hamidu et al. 2015). For example, the concepts of a research university and an entrepreneurial university are shorthand for how these kinds of KEOs should be organised, structured and managed in line with the roles, goals and objectives that each concept implies (Pinheiro and Stensaker 2014). Some studies have explored the tensions that can arise with the introduction of the third mission (Martin and Turner 2010), and other research has considered the implications for academic values (Abrahams and FitzGerald 2012), an area which is considered next.

2.3.5 Academic values

Several approaches emerge in the literature on changes in the role of KEOs, and the shift in relationships between KEOs and business. Some of the research explores the changes in norms and culture; other approaches have seen this as a moral stance that laments the erosion of academic freedom and scientific independence (Kleinman and Vallas 2001). Concerns about the commercialisation of KEOs were expressed as early as 1970s and grew in the US in the 1990s (Bowie 1994; Readings 1996; Slaughter and Rhoades 1996; Slaughter and Leslie 1997). Mertonian norms of science (communism, disinterested, universalism and organised scepticism ("CUDOS") have allegedly

been undermined by KEOs' increasing willingness to exploit their intellectual property for financial returns. As well as Mertonian norms, academics are influenced by traditional ideas or norms of academic freedom or autonomy, pursuit of knowledge for its own sake, open sharing of knowledge and research, education, and public good (Mendoza 2012). Academic freedom, independence, or autonomy is seen as an integral part of academic values. Academic freedom means academics having a right to research, teaching and publish without any interference (Kayrooz and Preston 2002). However Mertonian values persist (Anderson et al. 2010), even though they may conflict with growing university-industry relationships (Etzkowitz 1989; Metlay 2006), and KEOs' changing roles. The implications of this are considered in the next section.

2.3.6 Implications of KEOs' changing roles

The debate about KEOs' changing roles has led to concerns about institutions' abilities to balance pure and applied research, with different aspects of their mission. Concerns include, for example, conflicts of academic and commercial commitments and the resulting time pressures, how far business should benefit from public investment, and the extent to which public funding for a social or public good should be replaced by market forces (Anderson 2001). The growing "entrepreneurialism" of KEOs has led to a clash of expectations between academic ideals and the standards of business (Bowie 1994; Bok 2003). Industry and KEOs are judged by different ethical standards, with KEOs having more complex moral requirements placed on them, based largely on Mertonian norms (Kenney 1987). While academics focus on pure research, business's main drive is to make profit, and this can sometimes override ethical considerations (Kenney 1987; Fassin 1991; Dees and Elias 1998; Kumar 2010); they have different institutional logics (Sauermann and Stephan 2013).

For Kenney, biotechnology in US illustrates the ethical dilemmas in university-industry relationships (Kenney 1987). Fassin (1991) best summarises the different objectives of KEOs and business when he argues that an academic researcher wants *"to extend the limits of knowledge and seeks logical explanations",* whereas an industrial partner is focused *"on applications that can lead to products that can be commercialised"* (Fassin 1991, p.534). While

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business will try to insist on confidentiality and secrecy, and look to place restrictions on the publication and dissemination of research results, a KEO cannot accept secrecy or withhold data (Kenney 1987). A KEO's commercial connections can affect stakeholders' interests and compromise independent and objective decision-making; these kind of risks can result in lost integrity and damaged reputation (Mintz et al. 2010). Some scholars go further, arguing that KEOs have been damaged by the development of relationships with business; Government encouragement of commercial influence in KEOs has undermined the integrity of science and technology (Langley and Parkinson 2009). The effects of "corporatisation" of KEOs include introducing bias in and marginalising academic research that has social and environmental benefits, and creating conflicts of interest that tend to skew research results towards funders' expectations (Washburn 2005; Langley and Parkinson 2009).

Tensions can arise as KEOs attempt to become more entrepreneurial (Martin and Turner 2010) in the light of changing requirements about how knowledge is developed and applied (Nelles and Vorley 2010). KEOs have acquired a social mission of producing employable graduates, widening participation, providing lifelong learning and contributing to solving social problems (Jongbloed et al. 2008). These increasing demands are undermining KEOs' civic or social role (Calhoun 2006; Johnston et al. 2010). At the same time KEOs are having to increase their engagement with their stakeholders, as knowledge exchange has become an integral part of their role. An entrepreneurial KEO engages with its stakeholders (Redford and Fayolle 2014). "*Engagement involves a set of activities through which the university can demonstrate its relevance to the wider society and be held accountable*" (Jongbloed et al. 2008, p.313). Engaging with stakeholders is one of the elements of many KEOs' third mission activities (Jongbloed et al. 2008) and it is explored further in Section 2.4.5.

In this section the evolving roles of KEOs and the influence of the introduction of knowledge exchange on their development have been explored. In the next section, the discussion turns to CSR, the second key concept in this thesis.

2.4 (Corporate) Social Responsibility

In this section the concept of CSR, approaches to it, its relevance to KEOs, and its interconnection with stakeholders are explored.

2.4.1 Defining CSR

Although scholars trace the emergence of CSR to the US as early as the 1950s (Wartick and Cochran 1985; Matten and Moon 2008; Mehta 2011), there is no commonly agreed definition (Garriga and Mele 2004; Ehasz and Lan 2011). Different approaches have been taken to defining CSR and to developing models to capture the concept (Garriga and Mele 2004; Carroll and Shabana 2010; Kashyap et al. 2011; Rahman 2011). Some 37 definitions of CSR have been identified (Dahlsrud 2008; Ehasz and Lan 2011). Dahlsrud (2008) identified five dimensions that definitions of CSR seemed to share: stakeholder, social, economic, voluntariness and environmental (Dahlsrud 2008). Official definitions of CSR, such as the European Commission's, stress the voluntary nature of CSR and its applicability to business rather than other kinds of organisations (Kakabadse et al. 2005; EuropeanCommission 2011). These definitions attempt to link integration of social and environmental concerns, and sometimes human rights and sustainability, with organisational activities. The apparent lack of agreement about CSR reflects different views about the purpose of business, who or what has any claims on it, and the scope of business's social responsbility (Fischer 2004; Dahlsrud 2008).

2.4.2 Rationale for CSR

The growth of CSR has been attributed to several factors: increased public expectation of business, a growth in publicity which social media facilitates, the economic and social power of multi-nationals and non-governmental agencies, and the weakening of governmental power (Allinson 2004; Topal 2009; Mehta 2011). CSR advocates base their arguments on four premises: moral obligation, sustainability, licence to operate and reputation (Porter and Kramer 2006). Some organisations undertake CSR as a public relations exercise or to hide misconduct (Hemingway and Maclagan 2004). Organisations can practise CSR as a way of

managing risk ("do no harm") or by complying with laws and regulations (Groves et al. 2011). CSR can be instrumental by helping organisations improve their relationships with their stakeholders, and their reputation (Hemingway 2002; Ketola 2008; Asemah et al. 2013). CSR has been linked to improving organisational financial performance and creating economic benefits, improving competitiveness and as a key element in corporate strategy (Yang and Guo 2014).

2.4.3 Approaches to CSR

Secchi (2007) identifies four approaches in Garriga and Mele (2004)'s classification of CSR theories. Instrumental approaches assert that organisations use CSR as a way to maximise profits or surpluses, while political perspectives on CSR argue that organisations want to be seen to accept CSR obligations (Garriga and Mele 2004; Porter and Kramer 2006; Secchi 2007; Geva 2008). Integrative theories of CSR assert that organisations undertake CSR in acknowledgment of their social obligations; they depend on society for their existence and survival, and need a licence to operate; ethical approaches to CSR claim that relationships between business and society have a normative or moral imperative (Garriga and Mele 2004; Secchi 2007). CSR can be seen as a way of defining acceptable standards of organisational behaviour to create an ethical approach towards their activity and strategy (Tuzzolino and Armandi 1981; Hazlett et al. 2007). CSR is seen as embracing an organisation's economic, legal, philanthropic and ethical responsibilities (Carroll 1991; Garriga and Mele 2004), and this reflects one of the main approaches taken to defining and understanding CSR.

Carroll's CSR pyramid is one of the earliest models of CSR (Carroll 1979; Carroll 1991); it is one of the most widely accepted, and it is still relevant (Matten and Moon 2008). Carroll developed the model in 1979 and has revised it several times since then. Carroll has denied that the responsibilities are sequential, with economic responsibility as mandatory and the other responsibilities, legal, ethical and philanthropic, as increasingly discretionary; the pyramid was intended to be a visual rather than a literal representation (Carroll 1999). Each element of the

pyramid is an integral component of an organisation's social responsibility (Carroll 1999; Lee 2008).

Some scholars have criticised Carroll for trying to define universal standards for CSR and for ignoring differences in cultures and contexts outside Anglo-America (Visser 2006). Scholars recognise that CSR develops within and is dependent on the society, political systems and cultures within which it exists (Visser 2006; Lee 2008; Matten and Moon 2008; Ehasz and Lan 2011). Academics, such as Lantos, have extended Carroll's approach and identified three different elements: ethical, altruistic and strategic CSR (Lantos 2001). Table 2.2 compares Carroll's and Lantos's approaches and highlights the similarities and differences in their approaches to CSR.

Carroll's classification of CSR (Carroll 1979; Carroll 1991)
1. Economic responsibilities: be profitable for shareholders, provide good jobs for employees, and produce quality products for customers 2. Legal responsibilities: comply with laws and play by rules of the game 3. Ethical responsibilities: conduct business morally, doing what is right, just and fair, and avoiding harm 4. Philanthropic responsibilities: make voluntary contributions to society, giving time and money to good works
Lantos' corresponding classification of CSR (Lantos 2002)
1. Ethical CSR: morally mandatory fulfilment of a company's economic responsibilities, legal responsibilities, and ethical responsibilities 2. Altruistic CSR: Fulfilment of an organization's philanthropic responsibilities, going beyond preventing possible harm (ethical CSR) to helping alleviate public welfare deficiencies regardless of whether or not this will benefit the business itself 3. Strategic CSR: fulfilling those philanthropic responsibilities which will benefit the company through positive publicity and goodwill

Table 2.2 Types of CSR

Lantos's ethical CSR combines Carrol's economic, legal and ethical responsibilities into one category, "ethical CSR". Lantos' altruistic CSR is the equivalent of Carroll's philanthropic responsibilities while strategic CSR is discretionary, doing philanthropic work for the goodwill it generates, to enhance an organisation's reputation. However, both Carroll's pyramid (Carroll 1979; Carroll 1991) and Lantos's approach (Lantos 2002) seem to apply more to business than to KEOs.

2.4.4 KEOs and CSR

Although business and academia have been interested in CSR, public sector organisations have paid little attention to the concept (Rodríguez Bolívar et al. 2015). KEOs have taken up CSR, with an explicit focus on sustainability and environmental elements. HEFCE clearly links CSR to sustainability and environment issues (Higher Education Funding Council for England (HEFCE) 2011a) and does not embrace broader aspects of CSR (Higher Education Funding Council for England (HEFCE) 2011b). HEFCE does not seek to encourage universities to incorporate CSR into their research, teaching and third mission activities, or to apply the principles outlined in their CSR policy (Higher Education Funding Council for England (HEFCE) 2011b). It seems that universities' involvement in CSR has been marginal (Mehta 2011). Similarly, other funding agencies such as the research councils and the Government through the Department for Business, Innovation & Skills (BIS) do not encourage PSREs to embrace CSR.

CSR is an implicit element in KEOs' broader role and mission, particularly third mission activities (Jongbloed et al. 2008; Topal 2009). The idea of CSR in KEOs has been around since the 1980s in different guises, such as civic engagement, scholarship of engagement, and community engagement. Although each of these terms means different things, they have a common dimension: KEOs have a social responsibility to their stakeholders and their communities (Esfijani et al. 2013).

More recently these elements have been combined in the concept of University Social Responsibility (USR) (Tetřevová and Sabolová 2010b; Vasilescu et al. 2010). Definitions of USR tend to refer to CSR in KEOs involving behaving and promoting ethical conduct and practice in all their activities and in their relationships with their stakeholders (Asemah et al. 2013; Esfijani et al. 2013; Giuffré and Ratto 2014). Although there is no agreed definition of USR (Ehasz and Lan 2011; Esfijani et al. 2013), Esfijani et al (2013) identify seven aspects of USR: engagement, education, research, service, ethics, transparency and stakeholders (Esfijani et al. 2013).

Esfijani et al (2013) focus on the elements of USR rather than on the nature or kinds of responsibilities that Carroll identifies in the CSR pyramid. Carroll's economic, legal, ethical and philanthropic responsibilities are implicit in Esfijani et al (2013)'s concept of USR. Carroll's understanding of CSR (Carroll 1979; Carroll 1991) focuses on different kinds of an organisation's social responsibilities, particularly business, whereas Esfijani et al's approach links these responsibilities more clearly to KEOs' roles and activities (Esfijani et al. 2013).

2.4.5 CSR and stakeholders

Scholars have linked CSR and stakeholders (Carroll 1999; Esfijani et al. 2013) and this section explores the implications of this for knowledge exchange and KEOs. Since Freeman introduced the concept in 1984, stakeholder theory has become a key theme in CSR research (Carroll 1999). Freeman defines stakeholders as "*those groups who can affect or are affected by the achievement of an organization's purpose*" (Wood 1991). An alternative approach is to argue that all stakeholders with legitimate claims have an intrinsic value in themselves (Donaldson and Preston 1995), a normative or ethical approach. The purpose of stakeholder theory is ambiguous and its theoretical basis is unclear (El Hassani et al. 2014). While stakeholder theory has focused on business, it applies just as much to other sectors, including KEOs, charities and the public sector. As the roles of KEOs have changed, they have started to look at how they can develop and influence relationships with their stakeholders (Jongbloed et al. 2008; Benneworth and Jongbloed 2010; Tetřevová and Sabolová 2010a). For the purposes of this thesis, "stakeholder" is defined as: "*individuals, groups and organisations which have a legitimate interest in, interacts in some way with or influences a KEO or is influenced by their role, performance, goals, policies and activities or processes*" (researcher's definition).

Stakeholders give resources to KEOs, such as legitimacy, dependency and a licence to operate in return for acting responsibly and ethically (Asemah et al. 2013). There is a mutual relationship and responsibility between KEOs and their stakeholders as they can influence each other (Fassin 2012). Recognising

stakeholders means that KEOs have to relate and interact with them, have to decide how to do so, what criteria to use, and how to prioritise them (Greenwood 2007). For KEOs, stakeholder management can be defined as *"practices that a KEO undertakes to involve stakeholders in a positive manner in organisational activities"* (Greenwood 2007, p.315), such as collaborating with business in knowledge exchange. Some scholars argue that the relationships a KEO develops with its stakeholders are critical for its long-term effectiveness and so create moral obligations (Waddock 2004). This could form an ethical boundary for KEOs and the concept of ethical boundaries is explored in the next section.

2.5 Setting Ethical Boundaries

In this section, the potential relationship between ethics and the ethical dimensions of CSR to knowledge exchange are considered, and an attempt is made to start to define the ethical boundaries of knowledge exchange.

2.5.1 Defining ethics

Few scholars seem to distinguish between CSR and ethics when it comes to determining what it means for an organisation to be ethical (Hazlett et al. 2007). Other researchers draw a distinction. *"Social responsibility focuses on the impact that business activity has on society while ethics is concerned with the conduct of people within organisations"* (Fischer 2004, p.392).

"Ethics" is used in four ways in the literature: moral principles that guide and set standards for conduct and behaviour, often derived from the prevailing culture or cultural norms; beliefs and understanding of good and bad, right and wrong for individuals and groups; standards of behaviour and conduct, often understood as codes; and philosophical enquiry into ethical issues (Fischer 2004; Ehasz and Lan 2011). The consensus seems to be that ethics is about how people should relate to each other (Ehrich et al. 2005), and how they should behave.

Definitions in the literature often confuse "ethics" with "morality"; the terms are often used interchangeably in everyday speech and in academic literature (Fischer 2004; Esfijani et al. 2013). Ethics can be seen as being concerned with

behaviour that can benefit others or harm them; morality provides norms or standards for this (Cavico and Mujtaba 2012). Sometimes morality is perceived as dealing with customary or agreed principles and norms of behaviour and conduct; ethics is about the study of morality (Fischer 2004), and acting in line with moral standards and rules (Crowther and Reis 2011). Ethics are rules which are used to guide behaviour and provide criteria to use to evaluate alternative ways of behaving or possible different courses of actions to take (Trevino and Weaver 1994; Crowther and Reis 2011). Ethics are linked to values, in the sense of norms of what is acceptable and are often seen to provide objective standards of what is right and wrong, or acceptable and unacceptable (Morris 1956).

2.5.2 Approaching ethics

Some writers approach CSR from an ethical perspective and classify approaches to CSR according to ethical theories, using CSR as a bridge between business and ethics. The theories that are developed in attempts to identify and categorise moral principles cannot be reconciled easily. Table 2.3 summarises the three main approaches to ethical theories: consequentialism (teleology), deontology and virtue ethics, highlighting the main differences in their approaches (Whetstone 2001).

	Teleology	Deontology	Virtue ethics
Main focus	Compares costs and benefits of an act	Duties, morals and obligations, rules and principles based	Personal character development
A right action	Promotes the best consequences or outcomes in which happiness is maximised	Is in accordance with a moral principle required by God, natural law or rationality	Is one that a virtuous agent is disposed to make in the circumstances to flourish or live well

Table 2.3 Three Ethics Perspectives Adapted from (Whetstone 2001, Table 1, p. 103)

Other approaches categorise ethical theories between rules based and principles based (Whetstone 2001; Audi 2012). Carroll (1998) refers to utilitarian theories and theories of justice as action oriented as they focus on the ethics or morality of individuals' actions (Carroll 1998). Other scholars have developed different taxonomies by classifying both virtue theory and utilitarianism as outcomes

focused since they focus on the integrity or inherent correctness of actions (Hildur 2008).

Given the compartmentalisation of ethical theories, some scholars have identified four guidelines for applying ethical theories to business and organisations. An ethics theory should offer normative or prescriptive recommendations based on practical experience, focus on forming and developing values and so influence and change experience, recognise the significance of both persons and acts, and take account of the actual situation and cultural context as they affect the individual involved (Whetstone 2001).

2.5.3 Links between ethics and business

Business ethics is seen as defining and attempting to codify acceptable conduct and behaviour for organisations and individuals working for them (Carroll 1998; Fischer 2004). Although business ethics covers "*the very complex relation between ethics, economics and management*" (Fassin 2000, p.193), many scholars find that the literature is remote from everyday life, focusing on theoretical philosophical concepts, rather than situations which managers encounter (Kurland 1995; Carson 2004; Bucholz 2005), so that a gap emerges (McDonald 1999; Fassin 2000; Soule 2002). The gap between theory and practice may stem from the different stances taken to understanding ethics and the disciplines from which business ethics is approached (Fischer 2004; Norman 2012). The normative or prescriptive focus on developing theories about what ought to or should happen or be done, sets standards and ideals, and provides tools and techniques to use to evaluate ethics in practice (Carroll 1998). In contrast, descriptive or empirical approaches derived from social sciences focus on practice, what organisations and individuals do (Carroll 1998); they recognise that understanding and applying ethics may depend on the situation, be relative or need to take account of the context in which it is be applied (Trevino and Weaver 1994; Clegg et al. 2007).

2.5.4 KEOs and social contract

The public sees KEOs as the pursuers and holders of knowledge for its own sake, contributing to the "public good" (Enders and Jongbloed 2008).

Unfortunately "public good" is a difficult concept to define (Arjoon 2000). The public or common good is: *"the set of social assumptions or conditions that make it possible for the members of society (and also for the lesser societies) to realise their personal objectives"* (Argandoña 1998, p.1095). While higher education can be seen as a public rather than a private good (Chambers and Gopaul 2010), the concept has not been explored extensively and its real meaning remains obscure (Chambers and Gopaul 2010).

A KEO's research is usually focused on pure research that results in knowledge that has little commercial value (Sauermann and Stephan 2010). Goddard (2009) stresses the broader role of KEOs in contributing to society with knowledge exchange as an element in this (Goddard 2009). KEOs are expected to provide high quality education, to generate new knowledge and ideas through research, and provide impartial information for public benefit (Kenney 1987). So the changing role of KEOs can be seen as part of an evolving social contract. Societal requirements for different kinds of knowledge change, as has happened in the last 20 – 30 years (Hessels et al. 2009). In this framework, KEOs undertake publicly funded research, generate and develop knowledge, new ideas and inventions and these are made available to business to exploit and sustain social benefits and economic growth (Kumar 2010).

In the 1980s a revised social contract started to emerge. In return for public funding, KEOs are given a remit to contribute to economic growth, meet the social and economic needs of research users more clearly, and account for the use they make of the funding provided (Minshall et al. 2008; Hessels et al. 2009). KEOs have to show the relevance, value, significance and benefits of their research and teaching. They do this by demonstrating the impact of their research, the economic, social, cultural, public policy, quality of life and environmental benefits. KEOs now have to earn trust and legitimacy through various quality assurance and accountability mechanisms which Government and funding agencies such as HEFCE and the research councils have introduced (Calhoun 2006; Jongbloed et al. 2008; Martin 2011). While knowledge exchange is seen as a way of proving the impact of Government investment in KEOs, the

values that underlie knowledge exchange and potential ethical issues that could arise have not been addressed extensively in the literature.

2.5.5 Values in knowledge exchange

In looking at the ethics of knowledge exchange the underpinning values need to be determined. It has proved difficult to come up with a clear definition of "values" as it has been conceived of in different ways: types of personalities, motivations, attitudes, goals, and interest (Meglino and Ravlin 1998; Bardi and Schwartz 2003; Narasimhan et al. 2010). *"Values are both a powerful explanation of and influence on human behaviour."* (Homer and Kahle 1988, p.638). "Values" have been used in three different ways: as objective independent realities, subjective individual likes and dislikes, and as social constructs that vary with time and place (Aadland 2010). Other researchers have classified values as individual, organisational, institutional, societal and global (Hemingway 2002). Managers influence a KEO's organisational culture and its ethical climate; their values and behaviour contribute to shaping a KEO's ethical climate (Ruppel and Harrington 2000). Managers' understanding and attitudes towards ethics and social responsibility are related to their KEOs' values (Jin and Drozdenko 2010). In turn, values, beliefs and assumptions influence KEO decision-making and conduct (Beytekin et al. 2010).

Attempts have been made to determine whether there is any relationship between behaviour and actions, and motivation, or the personal values which individuals hold. Although an exhaustive list of values to use in business ethics has not been defined, attempts have been made in marketing ethics, such as respect for life, property, religion and justice, honest communication (Scott 2002). Schwartz attempts to take a more holistic approach by linking values to underlying motives, seeing them as expressing intentions or drives to act or behave in a particular way, whether consciously or unaware (Beatty et al. 1985; Schwartz and Boehnke 2004). While Schwartz's selection of values such as "honour", "transparency", "accountability", "honesty" and "responsibility" would not necessarily be recognised as making philosophical or ethical sense, they could be considered as a starting point for trying to define knowledge exchange values.

There seem to be links between institutional theory and organisational culture. Scott (2008) describes how institutional elements providing rules, guidance and norms that govern behaviour (Scott 2008; Wang et al. 2014). Institutional theory emphasises how KEOs are affected by their norms, rules and identities (Veciana and Urbano 2008; Geschwind and Karlsson 2014; Wang et al. 2014). An organisation's formal values are set out in its mission and value statements which define expectations of behaviour and action in the organisation (Jondle et al. 2014). Each organisation determines its own priorities about "right" and "wrong", ethical and unethical (Grojean et al. 2004). Grojean et al (2004) argue that *"an action can be judged as ethical if it upholds the value system of that organization''* (Grojean et al. 2004, p.226). Common formal organisational values include trust, honesty and integrity (Jondle et al. 2014). An organisation's implicit values are indicated in its rewards and incentives, hiring and promotion arrangements (Jondle et al. 2014). An organisation's values indicate what kind of organisational culture it has. It is not clear how academic and organisational values influence the values that underpin knowledge exchange and this gap will be addressed in the research.

In exploring knowledge exchange, authors have focused on the changing role of KEOs and the ethical issues that arise from the "'corporatisation" of KEOs and their increasing interaction with business. Analyses have focused mostly at organisational level and from academics' perspectives. While looking at ethical issues from a business perspective, writers identify issues that have implications for KEOs. These include, for example, corporate scientists caught in the "academic prestige" game, the implications of industry outsourcing research to academia, determining a fair price to pay, whether payment should depend on research results, and whether business should be responsible for funding academic research (Dees and Elias 1998; Langley and Parkinson 2009). However, debate on this does not seem to have developed very far; Kenney (1987) argues that the level of ethical debate in the US has been very low as academics are not held in high regard; as boundaries between university and industry are blurred, less public controversy is stirred (Kenney 1987). He blames the decentralised nature of the US education system and economy, and

competition among universities for the failure to adhere to any strict set of ethical values (Kenney 1987).

2.6 Conclusion

This chapter has explored the research territory of Responsible Knowledge Exchange and its main features from other scholars' perspectives. Like other publicly funded organisations, KEOs are becoming something akin to social enterprises, linking the production of knowledge and their other goods and services to social purposes (Benneworth and Jongbloed 2010). More importantly KEOs have to question and be concerned about with whom they collaborate, and the kind of research they undertake, which could potentially damage their reputation (Crawshaw 1985). Most of the literature tends to focus on knowledge exchange in universities and does not consider how knowledge exchange has extended to PSREs and how many knowledge exchange practitioners work there. Similarly, scholars tend to overlook the similarities between universities and PSREs both in culture, values and norms. Knowledge exchange practitioners working in universities and PSREs share many common issues, and this commonality is increasing as knowledge exchange becomes more embedded as part of the core role and mainstream activities in KEOs.

The chapter has revealed different views on the scope of knowledge exchange, questions about the significance of the implications of the changing KEOs' changing roles, and the lack of debate on the ethical implications of this. This Literature Review (Chapter 2) has shown the minimal attention which public sector organisations and KEOs have given CSR. Although the ethics of research and teaching are considered and managed proactively, the ethics of knowledge exchange has not been considered directly; there are no clear definitions of ethics and values in knowledge exchange. It is not clear how academic and organisational values influence the values that underpin knowledge exchange.

These raise fundamental issues and questions about the interconnection between CSR and knowledge exchange, the relationship between CSR and the roles of KEOs, the values that underpin knowledge exchange, and the kind of ethical issues that can arise in knowledge exchange and how these can be

managed. They form the research gap which is addressed in this thesis. The next chapter moves the discussion forward by outlining the research methodology used to address the research questions.

Chapter 3:   Research Methodology

3.1 Introduction

This chapter explores the research methodology which underpins this study. It explores the epistemological and ontological underpinnings of the approach which the researcher took to the research, since these influenced the methods and research design. The aims of the research are reviewed, the research design and research methods are addressed, and the sampling strategy, data collection, analysis and interpretation explored. The steps taken to managing ethical issues that could arise in the research process are addressed. The means used to ensure the quality of the data of the data are discussed, and the chapter concludes with an exploration of the potential limitations of the research design and methods. The broader context in which KEOs and knowledge exchange practitioners act is taken into account throughout.

3.2 Approach to Research

3.2.1 Epistemology, ontology and axiology

The worldview and the research philosophy which the researcher adopts inform the research questions, research methods, data collection, analysis and findings; the researcher and the research subject interact and inform each other, with implications for each stage of the research (Feilzer 2010). The philosophy which the researcher adopts is based on assumptions about how they view the world (Myers 2013, p.36; Creswell 2014, p.5) in two ways: epistemology and ontology. Epistemology is concerned about how a researcher understands the nature of knowledge: what constitutes knowledge, the extent to which knowledge represents reality, the relationship between knowledge and the researcher, what can be known, and how knowledge is developed (Bryman 2012, p.27). Table 3.1 illustrates how taking epistemological stances could influence the approach to the research.

Epistemology - positivist approach	Epistemology - interpretivist approach
Would test hypotheses about Responsible Knowledge Exchange to find out whether the concept could be validated. Facts would be gathered about elements of Responsible Knowledge Exchange and these would be used to develop generalisations ("laws") (Bryman 2012, p.28; Myers 2013, p.38), like scientific research (Saunders et al. 2009, p.113)	The idea of Responsible Knowledge Exchange would be evaluated through interviewees' experiences and understanding of its various elements (Bryman 2012, p.30; Myers 2013, p.39)

Table 3.1 Implications of different epistemological approaches for the research design and strategy

Table 3.1 shows how taking a positivist approach to the research would entail adopting a more objective, detached approach to the research. Taking an interpretivist approach to understanding Responsible Knowledge Exchange would involve evaluating interviewees' experience and comprehension of it.

Ontology is concerned about understanding the nature of reality, what constitutes reality, what exists in the real world and what can be known about it (Bryman 2012, p.32; Savin-Baden and Major 2013, p.57). Table 3.2 illustrates how different ontological approaches could influence the research strategy.

Ontology - objectivist approach	KEOs, knowledge exchange, CSR and stakeholders exist independently as concepts in their own right as entities which the researcher could apprehend (Saunders 2009, p.110; Doucet et al. 2010). Similar to the kind of approach taken in research in science where facts about phenomena, are collected and analysed (Patton 2015, p.724) objectively (Savin-Baden and Major 2013, p.56)
Ontology - subjectivist approach	Research is personal, based on the researcher's values and perceptions (Savin-Baden and Major 2013, p.56). KEOs, knowledge exchange, CSR and stakeholders are phenomena which are the outcomes of individual perceptions and the shared meanings that are given to them; they are created through continual social interaction (Saunders 2009, p.111). Focuses on interviewees' feelings and their perceptions of Responsible Knowledge Exchange (Myers 2013, p.39)

Table 3.2 Implications of different ontological approaches for the research design and strategy

Table 3.2 shows how in taking an objectivist approach would mean that concepts such as Responsible Knowledge Exchange and CSR existed in their own right and the aim of the research would be to understand them by gathering facts about them. In contrast taking a subjectivist approach in ontological terms means

that ideas such as Responsible Knowledge Exchange and CSR could only exist in the minds of knowledge exchange practitioners and could not be validated in their own right.

In attempting to understand research philosophy and methodology, discussion in the literature seems to be framed as a choice in epistemological terms between a positivist and interpretivist research stance, and between objectivism and subjectivism in ontology (Harrits 2011). There is an insistence on adopting particular epistemological and ontological stances, such as the ones illustrated in Table 3.1 and Table 3.2 and adhering to them throughout the research process (Denscombe 2008; Feilzer 2010; Patton 2015, p.88). Asserting such orthodoxy closes out potential options for exploring different ways of addressing research questions and undertaking the research (Morgan 2007). Pragmatism offers a possible solution to this apparent dichotomy (Feilzer 2010).

In this study "pragmatism" is used in a way that reflects Morgan's understanding of "paradigm" as a worldview and epistemological position: as an organising framework and using the most appropriate research methods to generate knowledge (Johnson et al. 2007; Bergman 2010; Patton 2015, p.89). The epistemological, ontological and axiological dimensions of the approach taken throughout the research are summarised in Table 3.3.

Philosophical dimension	Pragmatism
Epistemology - researcher's view of what constitutes acceptable knowledge	Either or both observable phenomena and subjective meanings can provide acceptable knowledge depending on the research question. Focuses on practical applied research, integrating different perspectives to help interpret the data. Not committed to a particular system or philosophy. Concerned with applications and solutions to problems
Ontology - researcher's view of the nature of reality or being	External, multiple views, chosen to best enable answering the research question. Research occurs in historical, social and political contexts. Focuses on the results of taking action
Axiology – researcher's view of the role of values in research	Values play a large role in interpreting the results with the researcher adopting both objective and subjective points of view

Table 3.3 Overview of pragmatism as a research philosophy Adapted from Table 4.1 Comparison of four research philosophies (Saunders et al. 2009, p.119; Creswell 2014, p.28; Patton 2015, pp.134-135)

Epistemologically, different approaches and perspectives can provide useful insights and contribute to gaining understanding and learning (Johnson and Onwuegbuzie 2004; Patton 2015, pp.153-154). From an ontological perspective, pragmatism's flexibility means that it can accommodate other philosophical perspectives (Ormerod 2006); it is pluralistic and allows a researcher to choose the research method which will best answer the research question (Onwuegbuzie and Leech 2005).

The values which are researcher adopted during their research (axiology) may influence research at different points, such as defining the research questions, selecting the research method, developing the research strategy and design, and collecting, analysing and interpreting data; a researcher should be open about their values and assumptions (Bryman 2012, p.39). From an axiological perspective, pragmatism allows a researcher to move between objective and subjective perspectives, using abductive reasoning, and accounting for a phenomenon such as Responsible Knowledge Exchange by understanding it from the interviewees' perspectives (Bryman 2012, p.401). Pragmatism closes the apparent divide in epistemological terms between positivism and interpretivism, and ontologically between objectivism and subjectivism by drawing on different worldviews, assumptions and methods (Creswell 2014, p.11; Patton 2015, p.154). At the same time pragmatism acknowledges that data and phenomena and how they are interpreted are open to change, can shift as knowledge and experience change (Feilzer 2010).

Pragmatic qualitative research focuses on the experience and understanding of individual knowledge exchange practitioners; these are built through interaction with and reflect the society to which they belong. Pragmatic qualitative research also enables the researcher understand the elements of Responsible Knowledge Exchange from each interviewee's perspective. Like interpretive description (see Section 3.2.2), pragmatic qualitative research tends to be used to provide insights and understandings that can be used in professional fields and practice, such as health, business and education (Savin-Baden and Major 2013, p.176). As the purpose of the research was to find out about a phenomenon through interviewees' perspectives and experience, using their language to describe facts

and experience, pragmatic qualitative research offered a way to explore Responsible Knowledge Exchange (Sandelowski 2000; Savin-Baden and Major 2013, pp.171-172).

3.2.2 Interpretive Description

Wolcott (1994) argues that description is the focus of qualitative research (Wolcott 1994, p.55) and he urges caution about attempting to undertake too much interpretation (Wolcott 1994, p.36, p.259). Building on this, interpretive description is an approach to qualitative research which develops elements of grounded theory and phenomenology (Thorne 2008, p.35, p.49). It is used in health and clinical research, and applied disciplines where researchers want to understand complex phenomenon (Thorne 2008, p.27).

Interpretive description seems to compliment pragmatism. Like pragmatism, interpretive description believes that reality is socially constructed through the subjective experience of the person who experiences it; an individual's experience and their perception of their experience is influenced by social and cultural forces (Thorne 2008, p.49). Interpretive description looks to find patterns, associations and relationships in the concept or phenomenon that is being studied by examining particular cases and instances (Thorne 2008, p.50). Like pragmatism, interpretive description recognises that there is a close relationship between the researcher and the phenomena being studied; the researcher and the research interact and influence each other (Thorne 2008, p.74). Both pragmatism and interpretive description look to bridge the gap between theory and practice (Kahlke 2014).

3.3 Research aims

The overall aim of the research was to explore the concept of Responsible Knowledge Exchange by investigating interconnections between knowledge exchange, CSR and ethics. This involved considering the insights that CSR and business ethics could contribute to developing an approach to sustainable knowledge exchange. The research objectives and the corresponding research questions are set out in Figure 3.1 below.
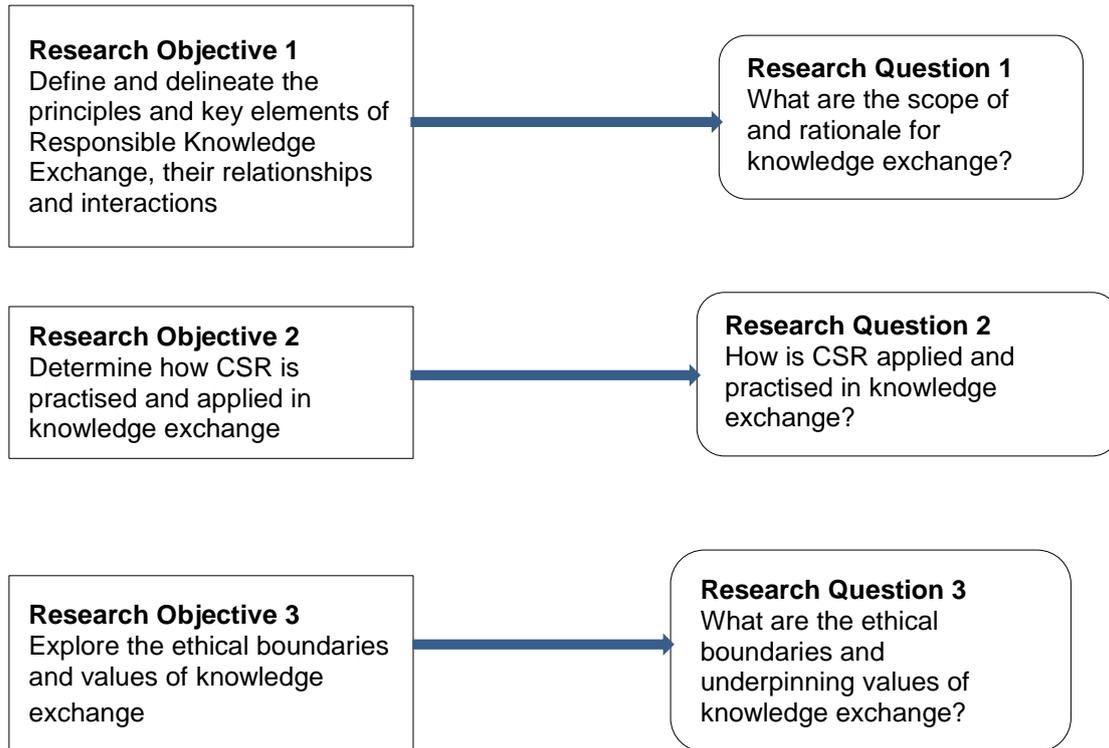
Figure 3.1 Research Objectives and Questions

The unit of observation and the unit of analysis in the research was the knowledge exchange practitioner representing their KEO in their professional capacity. This means that the findings in this study reflected the views of knowledge exchange practitioners in their professional setting rather than those of particular or kinds of KEOs.

3.4 Research design and methodology

As this research was trying to explore and define the phenomenon of Responsible Knowledge Exchange, it was felt that an exploratory study would allow a more creative, flexible approach to be taken (Hogue 2011). This would allow questions to be asked and enable Responsible Knowledge Exchange to be assessed, clarified and understood (Myers 2013, p.252). The conceptual framework set out in Figure 1.2, (Section 1.3 p.10) provided the starting point for the research design, data collection (see Section 3.8.1), analysis (Section 3.8.2) and interpretation (see Section 3.8.3) (Wolcott 1994, p.33). The research design is summarised in Figure 3.2.
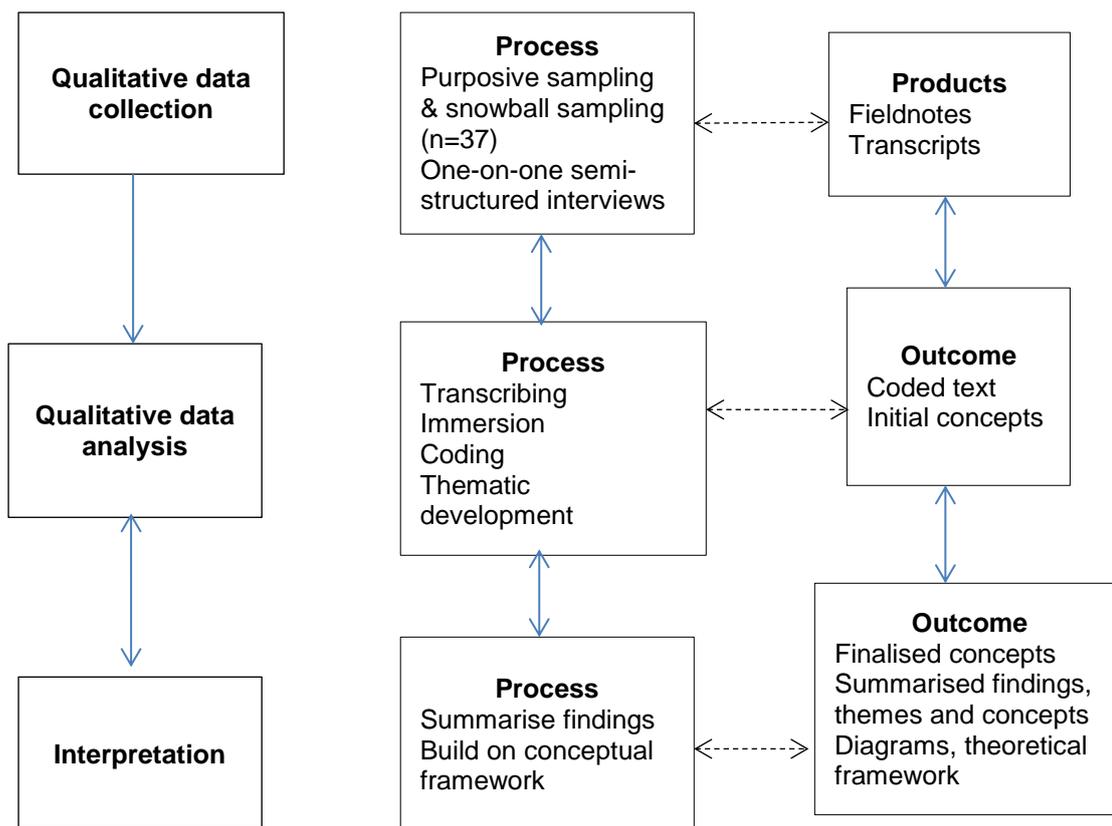
Figure 3.2 Exploratory Qualitative Research Design adapted from Figure 4.5 – Diagram for a Study That Used the Exploratory Design (Creswell and Plano-Clark 2011, p.124)

Although Figure 3.2 implies that the stages of data collection, analysis and interpretation are independent of each other, in practice a researcher moves backwards and forwards between them throughout the research process as their understanding of the data shifts and changes (Thorne et al. 1997).

3.5 Sampling strategy

This section outlines the approaches taken to selecting the sample and describes the characteristics of the interviewees.

3.5.1 Selecting the sample

In qualitative research, Patton (2002) argues that the objective is to focus on in-depth research using purposeful rather than random sampling. The aim is to select a sample of participants for the research which will throw light on the

phenomena being studied. This offers opportunities to gain insights and detailed understanding "*rather than empirical generalisations*" (Patton 2002, p.230). Steps are taken to try to ensure that the sample is varied so that participants differ from each other in their main characteristics (Bryman 2012, p.418).

In this study, the population comprised the supply side of knowledge exchange as represented by knowledge exchange practitioners in a range of KEOs which included funders, policy makers and advisors. The purposeful sample of 37 interviewees comprised a mix of knowledge exchange practitioners from pre-1992 and post-1992 universities (which are defined in Section 2.3.1, pp.20-21) and PSREs, including funders and policy makers. Figure 3.3 demonstrates the kinds of KEOs which the sample comprised. "Other KEOs" included a research centre, a knowledge exchange commissioner and funder and knowledge exchange consultancies.
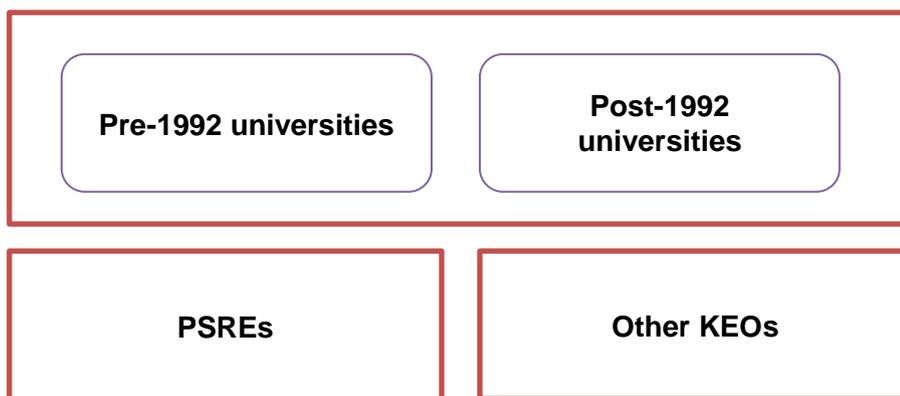
Figure 3.3 Types of KEOs included in the sample

The sample was recruited in two ways using a purposeful approach and snowball sampling. Snowball sampling is a particular technique used in purposeful sampling, when it is hard to identify participants from the desired population (Saunders et al. 2009, p.240). A small group of people relevant to the research questions is selected and those participants suggest other potential interviewees who have the characteristics which are relevant to the research questions (Bryman 2012, p.424). There is a risk of bias as interviewees will tend to choose other potential participants whom they know, and this can lead to a homogeneous sample (Saunders et al. 2009, p.240; Patton 2015, p.298).

In this research, using a purposeful approach to sampling involved approaching KEOs and using an awareness campaign via professional knowledge exchange networks of AURIL, PraxisUnico and IKT. An overview of these knowledge exchange networks is included in Appendix A (Definitions).

A snowball approach was used by asking interviewees to recommend other possible candidates to approach. The purposeful approach led to a more representative and robust selection that would give richer or detailed data (Kok et al. 2010). In practice, with one or two exceptions, most of the sample comprised knowledge exchange practitioners from KEOs located in England and Wales (Bryman 2012, p. 422). This potential limitation is discussed in Section 3.10.

3.5.2 Interviewees

The knowledge exchange practitioner representing their KEO in their professional capacity was the unit of observation and the unit of analysis. The total sample (n) was 37. The characteristics of the interviewees are highlighted in this section and details are given in Appendix F, which includes the designations used to identify each participant.

21 (56.8%) of the sample were male and the remainder (16 or 43.2%) were female. 19 or 51.4% of the interviewees were executive directors or directors compared with 18 or 48.7% of the interviewees who were heads or managers as shown in Figure 3.4.
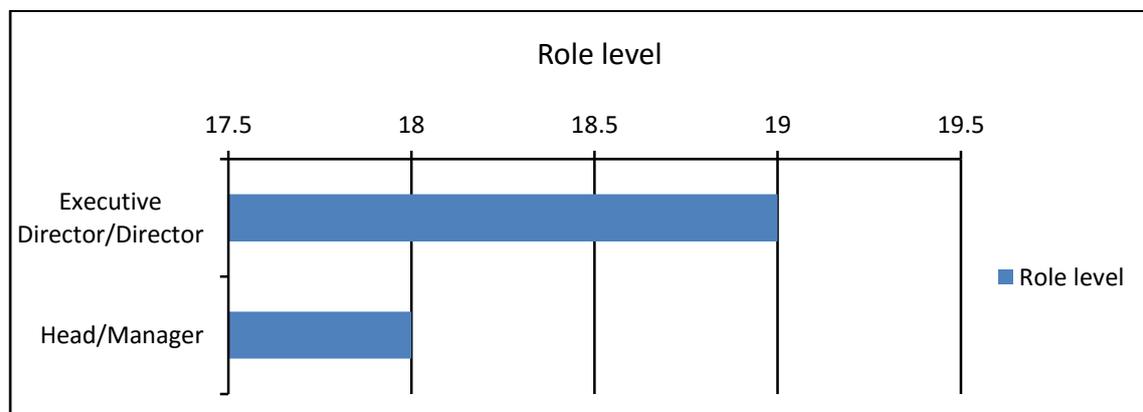
Figure 3.4 Roles of interviewees

Three main kinds of KEOs were included in the sample: universities, PSREs and others as Table 3.4 shows.

KEO Type – University	KEO Type – PSRE	KEO Type – Other
26	5	6
70.27%	13.51%	16.23%

Table 3.4 Interviewees – Types of KEOs

Of the 26 universities in the sample, 13 (50%) universities were pre-1992 universities and 13 (50%) of them were post-1992 universities.

The KEO status category reflected the roles and functions of their KEOs in knowledge exchange. The categorisation of the status of KEOs was based on the researcher's professional experience of the role, function and involvement of KEOs in knowledge exchange activities. These categories comprised funder, commissioner, policy maker, advisor and practitioner ("doer"). (More information about how these categories are defined can be found in Appendix A - Definitions). Interviewees were asked to classify their KEOs according to the status which they felt were appropriate, and they could assign their KEO to more than one category, as Table 3.5 illustrates.

Funder	Commissioner	Policymaker	Advisor	Doer
7	5	3	6	34
18.92%	13.51%	8.11%	16.22%	91.89%

Table 3.5 Interviewees - KEO Status

Figure 3.5 summarises this.
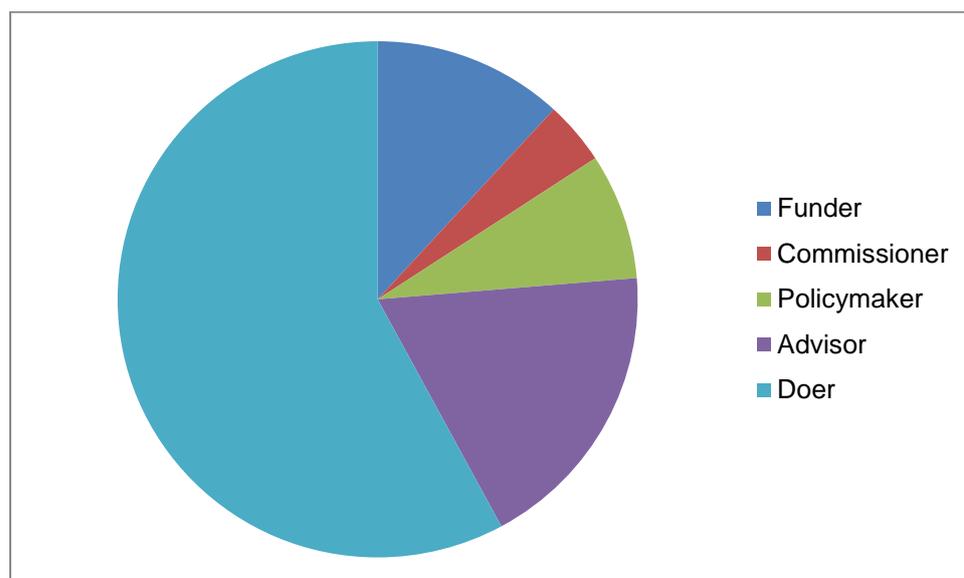
Figure 3.5 Interviewees' KEO status

3.6 Interview design

In qualitative research, an interview *"is a purposeful discussion between two or more people"* (Saunders et al. 2009, p.318) which allows the researcher to enter into the interviewee's perspective (Patton 2002, p.342). Another way of defining an interview is to see it as *"a conversation between two individuals in which the interviewer asks questions and the interviewee responds. When possible the goal is to replicate in a research setting the elements of a natural conversation"* (Savin-Baden and Major 2013, p.357). These definitions reflect the experience of undertaking interviews during the fieldwork.

Interviews were used to collect data for four reasons: to explore a complex phenomenon, Responsible Knowledge Exchange, (Patton 2015, p.426), to gather valid and reliable data relevant to the research questions and the research objectives (Saunders et al. 2009, p.318), to find out from the interviewees things that a researcher cannot observe directly (Patton 2002, p. 341), and to focus on and understand how interviewees perceive Responsible Knowledge Exchange (Bryman 2012, p.471; Myers 2013, p.120). Interviews strengthen the potential for being able to generalise from the data by establishing a relationship between research and existing theory to demonstrate the broader significance of research findings (Saunders et al. 2009, p.335).

Semi-structured rather than open interviews were used in this study as the researcher had only one opportunity to interview each participant. Using a list of themes and pre-set questions derived from the research questions (an "interview protocol" - Appendix E) allowed decisions to be made about how best to use the time available (Savin-Baden and Major 2013, p.359). Taking this approach meant that particular topics could be focused on (Bryman 2012, p.472), and time taken to probe (Saunders et al. 2009, p.321). The order of the questions varied among interviews according to the flow and direction of the discussion (Saunders et al. 2009, p.320; Savin-Baden and Major 2013, p.359). Additional questions were asked in the light of interviewees' responses and comments in order to probe and follow ideas (Savin-Baden and Major 2013, p.359).

A pilot study comprising five semi-structured interviews was undertaken. The interview questions were based around six themes: knowledge exchange, social responsibility, stakeholders, working with different sectors, and ethical boundaries. Although, the pilot study confirmed the validity of the interview questions, an additional question was added about commercial restrictions placed on KEOs' knowledge exchange activities, such as confidentiality, restrictions on publishing and patenting, and managing conflicts of interest.

3.7 Ethical considerations

Ethical considerations were at the forefront during the research. Formal ethical approval was sought and obtained through the University of Southampton before starting the fieldwork. The interviewees were knowledgeable, competent and articulate. Many of the interviewees knew the interviewer by having worked or collaborated with them in the past, either on a professional basis or through involvement in knowledge exchange professional networks such as AURIL, PraxisUnico and IKT. This meant that each interviewer and interviewee understood the issues and challenges of working in knowledge exchange. This could have created some issues which required consideration. For example, inviting interviewees to take part in the research could have been seen as a way of the interviewer trying to solicit new contacts. However, the research participants and the interviewer felt that they were on a par with each other

professionally and personally. The interviewer's experience and understanding of knowledge exchange helped to build confidence and trust with each interviewee.

Interviewees were given a participant information form, which formed part of the ethical approval application to the University of Southampton, to read at the start of the start of the interview (See Appendix B). The participant information form described the background to the research, explained how interviews would be recorded and transcribed, advised that the recordings would be stored securely, stated that only the researcher and their two supervisors would have access to them, and confirmed that data would be anonymised and interviewees' names, organisations or job titles would not be used in any thesis or report. Interviewees were given a consent form which reiterated the confidentiality arrangements, confirmed that participation in the research was voluntary, and that participants could withdraw at any time (See Appendix C).

At the end of the interview, interviewees were given a debriefing sheet for information which explained the objectives of the research, and the research questions, how the data findings would be used and confirmed that active deception was not used in the study (See Appendix D). The protocols defined in the participant information and consent forms, and participant debriefing were followed right through the fieldwork and beyond; they were an important factor in the interview design and during the data collection, analysis and interpretation.

3.8 Data collection, analysis and interpretation

This section explores how the data were collected, analysed and interpreted.

3.8.1   Data collection

The pilot study was undertaken between 20 November and 4 December 2012. The main study comprised 26 interviews and these were held between mid-December 2012 and March 2013. Six further interviews were held between early August and mid-September 2013 to confirm the emerging findings from the first

31 interviews; so 37 interviews involving 38 interviewees were held. During the pilot study, it was found that interviews lasted between 60 – 90 minutes, and this pattern was repeated during the main study. All the interviews were recorded. Twenty six interviews were held face-to-face, 11 were conducted on Skype and one was held on the telephone. As one of the recordings proved to be faulty and could not be transcribed, 36 interviews involving 37 interviewees were transcribed and analysed.

In addition, the characteristics of each of the interviewees were captured. These variables included the name of their organisation, the level or kind of role (executive director/director and head/manager), their type of KEO (university, PSRE or other), and the status of the KEO in terms of their role or involvement in knowledge exchange. Interviewees were invited to classify the role of their KEO in knowledge exchange, using one or more of the categories as appropriate and this is explained in Section 3.5.2. (The main details of the interviewees are set out in Appendix F and they are discussed in detail in Section 3.5.2).

3.8.2 Data analysis

In qualitative research, analysing data involves "*transforming data into research results*" (Wolcott 1994, p.24; LeCompte 2000), breaking the data into small parts to examine them and to make sense of them (Savin-Baden and Major 2013, p.434). Data analysis consisted of several steps, moving from transcribing recordings of interviews, to immersion in the data to ensure familiarity with it, to coding or breaking the data into segments or chunks and grouping these segments into similar groups to identify patterns and similarities (Savin-Baden and Major 2013, p.422). Data analysis was an iterative process which involved moving forward and back across the data and the coded data segments (Braun and Clarke 2006; de Casterle et al. 2012), looking for themes, similarities and patterns.

Although coding was not the same as analysis, it was a significant element of it (Basit 2003). Coding was a way to think about the meaning of data and reduce the amount of data (Bryman 2012, p.577). The data was analysed using Dedoose software. Using Dedoose still involved thinking and deliberating about

which codes to use, to reject some and replace them with others which offered more insights and could be combined to create concepts to understand and more clearly explain the phenomena being studied (Basit 2003).

Thematic analysis, which is a common approach in data analysis in qualitative research, was used as a way to identify, analyse and find patterns in the data (Savin-Baden and Major 2013, p.439). There are few guidelines on how to use it (Braun and Clarke 2006) and it is not linked to a particular philosophical position (Savin-Baden and Major 2013, p.440). Analytical induction was used as a key part of coding. This involved looking for similarities between phenomena or events to develop basic concepts of understanding, and started with developing broad categories and then moved on to sub-categories (Savin-Baden and Major 2013, p.441). Preliminary data analysis of the data started on 1 April 2013 and more detailed data analysis was carried out between mid-September and Christmas 2013, using a list of first level thematic codes as a starting point on Dedoose. The themes captured something significant about the data, and what the interviewees said which shed light on the research questions and phenomena being studied (Braun and Clarke 2006).

A priori or structural codes (Saldana 2009, p.49) were derived from the themes of the interview questions, and could be linked to each research question and research objectives (as set out in Section 1.4, p.11 and Section 3.3, p.48). The codes or themes evolved during the coding: the first level codes were reviewed and modified during the initial analysis by adding up to three extra ones. The main structure, however, remained unaltered and was validated during the initial analysis.

The next stage was to group or categorise the codes, looking for patterns and relationships among them to identify categories and develop concepts (Savin-Baden and Major 2013, p.426). Meta or pattern codes (Bazeley 2013, p.235; Miles et al. 2014, p.86) were derived by grouping the first level codes into broader concepts. The final list of first level codes and the metacodes is in Appendix G. Progress and reflections on the data analysis were recorded in a PhD log and memos were written to record particular ideas, points and concerns which emerged during the data analysis.

3.8.3 Interpreting the data

In theory, interpretation of the data is undertaken once the data analysis is completed. In practice, interpretation started early during the research, during the Literature Review (Chapter 2), undertaken during data collection, and taken further during and after analysis (Savin-Baden and Major 2013, p.452). Interpretation involved five elements: translating concepts and themes that emerged in the data analysis; understanding what the data revealed about the research questions and the phenomena being studied (Thorne et al. 2008); understanding the data in context, looking at the meanings and all of the interviewees' perspectives (Savin-Baden and Major 2013, p.454) and addressing the meaning and content of the data (Wolcott 1994, p.12).

In pragmatic qualitative research, the focus of interpretation is a basic description of the issue under study (Wolcott 1994, p.29). Themes which emerged during data analysis guided interpretation of the data, and interpretation occurred as and when interconnections were made and noted (Wolcott 1994, p.29). The aim was to stay as close to data as possible as it was recorded (Wolcott 1994, p.10). The conceptual framework in Figure 1.2 (Section 1.3, p.10) was used as a way to review the data and assess whether the theories or concepts which were emerging were useful (Savin-Baden and Major 2013, p.457). Maintaining a reflective diary during data collection, analysis and interpretation was used as a way to sustain awareness of personal values, and epistemological and ontological assumptions; these influenced decisions about what to include and what to omit (Wolcott 1994, p.13; Thorne et al. 2008).

3.9 Ensuring the quality of the research

Ensuring the quality of the research is the final aspect of research design and research methods. There has been much discussion in the literature about the most effective way of doing this. To minimise confusion, a distinction is made here between the criteria used to assess the quality of research and the means or techniques used to verify that the criteria are satisfied (Long and Johnson 2000; Whittemore et al. 2001; Caelli et al. 2008).

3.9.1 Defining the criteria

Researchers have debated how far validity and reliability can be applied in qualitative research, including a tension between the apparent subjectivity of qualitative research and using objective criteria to assess quality (Savin-Baden and Major 2013, p.474). The literature on ensuring quality in qualitative research tends to divide into three streams; in one stream, scholars try to adapt criteria conventionally used in quantitative research (Long and Johnson 2000; Morse et al. 2008); a second stream of scholars argue that qualitative research calls for different criteria (Caelli et al. 2008); and a third set of researchers claim that defined criteria cannot be used in qualitative research (Rolfe 2006). The different perspectives in this debate stem from differences in researchers' epistemological and ontological positions (Whittemore et al. 2001). The different sets of criteria which Patton (2002) describes reflect this approach; his criteria range from traditional scientific ones to social construction and constructivist (Patton 2002, pp.544-545).

Different schema or criteria have been proposed for use in qualitative research as alternatives to reliability and validity (Bryman 2012, pp.389-390). These include using criteria such as reliability and validity as they are used in quantitative research, or using criteria developed specifically for qualitative research, such as trustworthiness, which comprises credibility, transferability, dependability and confirmability (Bryman 2012, pp.390-393). Some scholars argue against mixing and matching criteria from different schema to avoid creating tensions and potential conflict between them (Patton 2002, p.551). Researchers should select criteria that reflect their philosophical viewpoint, and choose a term that fits with their philosophical viewpoint to use as their goal for their qualitative research (Savin-Baden and Major 2013, pp.470-471).

As a pragmatist, a researcher can adopt criteria that can be applied across all approaches to research. A pragmatist may want to use validity and reliability (Savin-Baden and Major 2013, p.175, p.474), an approach that other authors endorse (Bryman 2012, p.389, p.398). Using criteria of validity and reliability offers a way of circumventing the multiplicity of alternative terms used in the literature (Creswell and Miller 2000). As Morse et al (2008) argue, validating

research involves checking and verifying the truth and reality of the research (and the interviewees' views and situations) and hence the credibility and consistency of the data, findings and conclusions (Morse et al. 2008).

Validity and reliability are the traditional criteria used in quantitative research (Morse et al. 2008) and these are starting to move back into favour (Bryman 2012, p.398). In this thesis, "validity" in the sense of "truth" is used in two senses: internal validity meaning the extent to which findings match reality, and external validity which refers to the degree to which findings can be assumed to be true for other cases (Savin-Baden and Major 2013, p.473). "Reliability" is used in this thesis in the sense of dependability, consistency and stability (Long and Johnson 2000).

3.9.2 Satisfying the criteria

To ensure quality of the research, a range of strategies was used. These were based on the needs of the research and on the criteria selected to use to assess the quality of the research (Savin-Baden and Major 2013, p.484). These approaches included reflexivity, self-awareness, maintaining an audit trail, and steps taken to ensure validity and reliability.

Self-awareness or reflexivity was one of the most important ways of ensuring the quality of the research (Thorne et al. 1997). This involved acknowledging and understanding personal biases and assumptions, the interaction between the researcher and the research process, and their role as an interpreter of the data. Self-awareness was also part of maintaining methodological awareness and being sensitive to the impact of decisions made during the research process, data collection and analysis. To manage and sustain self and methodological awareness, a journal was kept about personal feelings and reflections during data collection, analysis and interpretation (Thorne et al. 1997; Creswell 2009, p.192). This helped in recognising personal influences on the research, and considering how the data findings were influencing personal thinking and reactions (Creswell and Miller 2000).

Maintaining a reflective journal also formed part of developing and maintaining a clear audit trail of the data collection, analysis and interpretation to ensure

reliability. Maintaining an audit trail involved keeping records of each step taken in analysing the data, such as notes, lists of codes and categories, the structure of themes and concepts, and a personal journal. This meant that an independent third party or the researcher could retrace the steps that the researcher took and reconstruct them if necessary (Thorne et al. 1997; Creswell 2009, p.192). This helped to ensure the validity of the research (Long and Johnson 2000). It also helped to ensure that the research findings were the product of the research, not the researcher's views. This was reinforced by adopting a constant philosophical stance throughout the study to ensure methodological consistency.

Reliability and the substance of concepts were managed by deriving them from first level or pattern codes which were combined to form metacodes and then into concepts (Bazeley 2013, pp.234-235). Concepts were linked systematically by using them to generate a conceptual framework (Bazeley 2013, pp.240 - 242). Lack of categories and links among concepts were managed as codes had parents and grandparents where appropriate (Bazeley 2013, pp.234-235). The research findings were linked to the research aims and research questions and this approach offered new insights. Exceptions or negative cases (cases which did not fit with the emerging findings or contradicted them) were used in two ways; to test the validity of the findings, and to ensure that the analysis was developed sufficiently so that it reflected most of the cases, categories and themes (Thorne et al. 2008; Bazeley 2013, p.313, pp.354-355). Memos and a reflective journal were used to record thoughts and ideas, to show how these grew and changed through the research process; this approach contributed to developing and maintaining a clear audit trail. This also helped to ensure the dependability of the research (Savin-Baden and Major 2013, pp.479-480).

The validity of the research was managed by using a range of techniques such as prolonged engagement with the data, and keeping a reflective journal (Long and Johnson 2000). Prolonged engagement with and immersion in the data helped to ensure that the findings reflected the interviewees' experience (Creswell 2009, pp.191-192). Similarly using detailed description where the research provided sufficient findings in the form of extracts from the data or quotations reinforced this (Savin-Baden and Major 2013, p.480); care was taken

not to over rely on them (Thorne et al. 2008). Negative or apparently contradictory findings were explored and analysed, their differences investigated and reconciled (Creswell and Miller 2000).

The interview questions were tested in a pilot study and modified in the light of this, and there were minimal gaps in time between conducting the pilot interviews and launching the full study. Emerging findings from the interviews were identified and verified across a range of interview transcripts to ensure their validity and reliability. The risk of a lack of clarity on whether the objective is descriptive or to develop a theory was addressed in several ways: through consistent development and consistent use of codes, constant comparison, recognising "saturation" when the data were no longer providing any additional information (Creswell 2007, p.240), and using and developing codes (Savin-Baden and Major 2013, pp.479-480).

Using a range of techniques to validate the research process enabled different perspectives to be applied, different aspects of the research design to be considered as they were implemented, and to provide evidence of the means used. These also helped to ensure the validity and reliability of the research.

3.10   Limitations

The research design and methods had two limitations. Most of the sample comprised knowledge exchange practitioners from KEOs located in England (Bryman 2012, p.422). One interviewee came from a KEO in Wales, but as the recording was indecipherable, the interview could not be transcribed and so was not used. The geographic range of the sample of KEOs in England could give a less reliable picture of the issues being explored than would a random sample drawn from a larger geographic spread of population. This could have led a bias in favour of more research intensive universities in the south-east of England, or for a particular age of university. The potential limited geographic range of the interviewees could also mean that the findings could not be generalised to knowledge exchange practitioners and KEOs in other parts of the UK.

The potential limited geographical spread of the study was managed in two ways: by ensuring that the participants, who were selected through purposive sampling,

represented a cross-section of kinds of knowledge exchange practitioners and different kinds of KEOs; and that the sample included participants from different role levels in KEOs. A larger, broader mix of participants was used to generate rich data and detailed description to illustrate the research findings, to provide different perspectives on a theme, and to provide a broader context (Creswell 2009, pp.191-192). These approaches helped to offset some of the risk of potential bias. In practice, the sample turned out to include an equal number of pre-1992 and post-1992 universities (see Section 3.5.2). Being able to generalise the findings from qualitative research is not the main issue: the substantive question is about the quality of the theory developed from the data that is the real concern (Bryman 2012, p.406).

3.11   Conclusion

The aim of this chapter has been to look at how the research methodology was approached and applied. The chapter started by exploring the epistemological and ontological underpinnings of the research methodology. Debate about research philosophy in the literature is often framed as a choice between positivist and interpretivist research philosophy in epistemological terms or objectivist and subjectivist in ontological terms. This can be frustrating and efforts were made to find an alternative philosophical stance to underpin the epistemological, ontological, and methodological approaches. Adopting a pragmatist paradigm allowed the most appropriate research methods to be used to answer the research questions (Saunders et al. 2009, p.109).

Having established the philosophical framework, the nature of qualitative research was explored and how adopting a pragmatic approach to this, complimented by interpretive description, supported an exploratory study of Responsible Knowledge Exchange as a phenomenon. The purposeful approach to the sampling strategy and the characteristics of the interviewees (n=37) were described. The steps taken to ensure that ethical considerations were maintained at the forefront of the research were explained, and how these were verified by obtaining formal ethical approval for the study.

The approach taken to undertaking the fieldwork was described. Semi-structured interviews were used to collect data. This method enabled valid and reliable data to be gathered about those things that could not be observed immediately, and to discover how knowledge exchange practitioners understood Responsible Knowledge Exchange. During data analysis, the data were examined in segments for patterns and similarities. Using a preliminary set of a priori codes derived from the research questions and the interview questions, thematic coding was used to identify categories, patterns and to develop concepts that could form a starting point for interpreting the data.

Approaches to ensuring the quality of the data were addressed. Validity and reliability were used as the criteria. Strategies used to ensure the quality of the research included reflexivity by keeping a personal reflective journal. This served two purposes: it helped to maintain personal awareness by recognising factors that could influence the research, and recorded how the data findings influenced personal thinking and reactions. The personal log was also used to document the steps taken during the research process and helped to create an audit or decision-making trail. Finally the limitations of the research methodology were addressed. The next chapter, Chapter 4, turns from considering the research strategy, design and fieldwork to explore the first part of the research findings.

Chapter 4: KEOs engaging with the world: Research Findings I

4.1 Introduction

This chapter and the next one (Chapter 5) explore the research findings. The chapters follow the conceptual framework set out in Figure 1.2 (Section 1.3, p.10) which guided the data collection, analysis and interpretation (Wolcott 1994, p.33). Knowledge exchange practitioners representing their KEO in their professional capacity are the focus of the research findings and these reflect their views. While KEOs are large, complex and varied organisations with different structures and ethos (Martin and Turner 2010), they are all involved in knowledge exchange in some way (D'Este et al. 2010), although the degree of integration can vary. As the roles of knowledge exchange practitioners share some common features (Knight and Lightowler 2010), their views may not always reflect differences among KEOs. This chapter focuses on knowledge exchange practitioners' thoughts about how KEOs engage with external organisations and explores these in five ways: the roles of KEOs; dimensions of knowledge exchange; stakeholders; collaborating with business and working with controversial sectors and organisations.

4.2 Roles and Perceptions of KEOs

To be able to understand knowledge exchange within a broader context and to comprehend the viewpoint of knowledge exchange practitioners, this section looks at the roles and perceptions of KEOs. Together these perspectives offer new insights into the relationships between KEOs and their stakeholders.

4.2.1 Roles of KEOs

KEOs had several roles which are summarised in Figure 4.1.

A business

Research

A charity

Role of KEOs

Teaching

Business focused

Community focus

Figure 4.1 Roles of KEOs

Although KEOs were understood to be educational and research organisations, they were also seen as large research and education businesses, corporate entities where finance was a significant influence. KEOs had always been run like large, albeit lax, academic-led businesses. KEOs would tend to make final decisions based on academic rather than financial considerations; for example, restructuring to secure additional academic benefits tended to lead to improved research council income. Recent changes in UK higher education had contributed to changes in the perception of universities. One view was that KEOs were effectively privatised and no longer part of the public sector. On the other hand, although KEOs should be more business facing and business-like, they should have a social responsibility as much of their funding came from the taxpayer.

> *"And one of the things that I think … is that universities are big businesses. …. You can cut through it and say yes, this that and the other, but the reality is that we are a business …. It is an education business, a research business, this sort of thing, but we are a business."* (Interviewee No.27_1-Pre-1992 university)

> *"…. the executive team in all universities spends a lot of its time, as in any other business, looking at the bottom line, practically, what's the income, which areas of the university are loss making, what can you do to turn them round or close them? So it's run exactly like a business, but the difference is that when push comes to shove the universities will make a final decision based on the academic considerations rather than the financial ones… "* (Interviewee No.34-KEO-Other)

These findings echo some of the issues explored in the literature about the "corporatisation" of KEOs. Kezar (2004) argues that KEOs' academic roles in the US are being transformed into corporate entities. Higher education is increasingly becoming a business, more focused on economic goals of producing workers as its goal (Kezar 2004; Henkel 2007). Howard (2011) comments that KEOs are businesses, part of an international higher education industry, which must be viable financially and ideally create a surplus (Howard 2011, p.21; Parker 2011; Shore and Taitz 2012). KEOs in the UK and Australia have moved to redefining the role of vice-chancellors as chief executives and KEOs' councils or governing bodies are being restructured as corporate board; decision making and control are concentrated in senior management. In their review of developments at the University of Auckland, Shore and Taitz (2012) observe the move towards using commercial language and business management practices, such as preparing annual strategic plans; KEO management structures are becoming more hierarchical and centralised and the governing board is appointed rather than elected (Shore and Taitz 2012). The implications of these changes are discussed in Section 6.2.2 (pp.177-180).

However, most KEOs were either charities or had charitable status for tax purposes; there could be unease about KEOs seeking to commercialise the results of their research with the aim of generating income, a possible conflict between commercial gain and KEOs' charitable objectives.

"The ethics side of it, I would say yes. I think it's a difficult one when there's commercial gain and mixing sort of more charitable status with commercial gain." (Interviewee No.15–Post-1992 university)

Doing high quality world class excellent research and teaching was seen as fundamental to KEOs, part of their core mission. KEOs undertook research because academics were curious about what was going on in the outside world; they wanted their research to be leading edge and applicable.

The alleged divide between pure research and applied research in KEOs could be more apparent than real. Applied research should not be undertaken at the expense of pure research. Retaining the capability to undertake pure research was as important as it was to do applied research; there was a need for KEOs to continue undertaking pure research as the results or outcomes of this would feed through in 10 - 20 years' time. There was interaction between pure and applied research; developments in applied research could lead to understandings in pure research. This finding partly reflects ambivalence in the literature about the move from pure to applied research (Van Looy et al. 2004).

Some research was high profile which the public found easy to understand, and found exciting. It was a struggle to secure public support to maintain the level of public funding for research; the research which KEOs undertook had to have practical value. However, business did not want KEOs to become centres of outsourced research and development driven only by return on investment in each project. Although it was acknowledged that much research could be not applied immediately, business wanted to engage with KEOs to help identify a potential application or use for research. Business did not want to direct KEOs on what research to do; they wanted to collaborate with academics to identify the issues that concerned industry.

KEOs were seen as places to teach, not as places of learning. The public saw going to university as an extension of school.

"I think some probably see them as ivory towers, some see them as a resource, some see them as a big building but they're not really sure what goes in it, and some see it almost as an extension of schooling." (Interviewee No.37– Post-1992 university)

This partly echoes concerns expressed in the literature about the changing role of teaching and learning in KEOs.

Rinne and Koivula (2005) review the literature on changes in European universities and observe how European universities offer customised short courses and treat students as customers (Rinne and Koivula 2005). Kayrooz et al (2001) echo this experience in their research at Australian universities (Kayrooz et al. 2001), and Shore and Taitz (2012) find similar trends at the University of Auckland (Shore and Taitz 2012).

From another perspective, the research findings showed that KEOs were not just places to train people to gain knowledge and scholarship: they had to go further and be socially responsible, and turn out people who were good citizens. As well as research and teaching, KEOs were part of their local community and had responsibilities to them. KEOs were often dominant players in their community, and often the largest employer. KEOs were often strong central hubs in the local community as a physical location, were a public space. Many KEOs opened their facilities to the local community; for example, their sports facilities, arts centres and theatres. Some KEOs ran and managed other local facilities such as a bus company and conference company. KEOs needed to consider the impact on the local community when they constructed new buildings and expanded their campuses. KEOs also had a social impact in their community in terms of the number of students relative to the size of the local residential population. KEOs had a responsibility to maintain good relationships with the local community, the local authority and NHS, and to look after their students.

> *"The university is a strong central hub in any one community, whether it's a physical location where it's... or the research community that it is part of, because it's all very national and international."* (Interviewee No.9–PSRE)

> *"I know that the sports training village do a lot of sport engagement. We're working with the City football and the rugby teams and the younger players from all ages, so that engagement is there."* (Interviewee No.31–Pre-1992 university)

> *"There's a lot more local travelling, this is why we run the bus company because we have to get them here somehow. We cannot park them all."* (Interviewee No.29-Post-1992 university)

KEOs were significant contributors to their local economy. An estimate was that a large KEO could put about £1billion into the local economy. International students brought in substantial amounts of foreign exchange. As part of their contribution to the local economy, some KEOs were building innovation spaces locally or providing space for companies to co-locate with them, so that the firms could access their facilities and collaborate with them. Other KEOs contributed to the local community by supporting staff and student volunteering.

Public perception of KEOs' involvement in the local community varied. Some of the public were well informed and saw that KEOs were reaching out to the community and becoming more accessible. KEOs were working hard at developing and improving their relationships with their region. While KEOs contributed to their immediate local community in their town or city, they were also very much aware that they were players in larger communities, regionally and nationally.

KEOs' responsibilities in their communities included supporting local business. Many KEOs were members of Local Enterprise Partnerships (LEPs) and active players in their city or region, not just as providers of services, but taking the lead in driving local agenda forward.

> *"We also work closely with the LEPs and the City councils and people like, local authorities."* (Interviewee No.25–Post-1992 university)

Engaging with business used to be seen as secondary; there had been a change of culture in KEOs in recent years; academics were now interested in working with business. With the greater emphasis on employability for students, some KEOs were working closely with local employers to secure placements for undergraduates and involving them in developing the curriculum. Working with local business was an integral part of KEOs' role. As an interviewee explained:

> *"So working with business is kind of in our DNA. So that's part of it."* (Interviewee No.19–Post-1992 university)

KEOs believed that they had a social responsibility to the business community, to give them access to knowledge and expertise, to support them and to help them to solve problems. This included, bringing businesses into KEOs to see them as a place where they would want to be involved. KEOs had access to large networks which were a local resource for business. KEOs supported local business events and chambers of commerce. People held KEOs in a higher degree of trust than other organisations; they were seen as politically neutral.

> *"… because often people hold universities in a higher degree of trust than they do many other organisations, and they're seen as sort of politically neutral."* (Interviewee No.10–Pre-1992 university)

Scholars have identified similar patterns. Chatterton (2000) uses the universities in Bristol as case studies to explore universities' cultural roles, which could be understood as part of KEOs' third mission (Chatterton 2000). He highlights how KEOs have traditionally been remote from their communities; changes in Government policy are encouraging KEOs to become more involved with their communities, including through cultural activities. On the other hand Kelly (2008) finds post-1992 universities have tended to identify with their region's educational and economic needs (Kelly 2008). Using evidence from the UK, Sweden and Austria, Trippl et al (2012) find that KEOs contribute to their communities by creating jobs and spinouts and act as hubs for local industry by making their research available and attracting talent (Trippl et al. 2012).

KEOs' community focus is closely interlinked with community as an aspect of CSR in knowledge exchange which is explored in Section 5.2 (pp.121-123). This section has explored the roles of KEOs, their different areas of responsibility. In

the next section, the research findings on perceptions of KEOs and their roles are explored.

4.2.2 Perceptions of KEOs

In the previous section, the roles of KEOs and the foci of their main activities were explored. In this section, perceptions of KEOs are considered. Figure 4.2 summarises the themes that emerged from knowledge exchange practitioners' views.
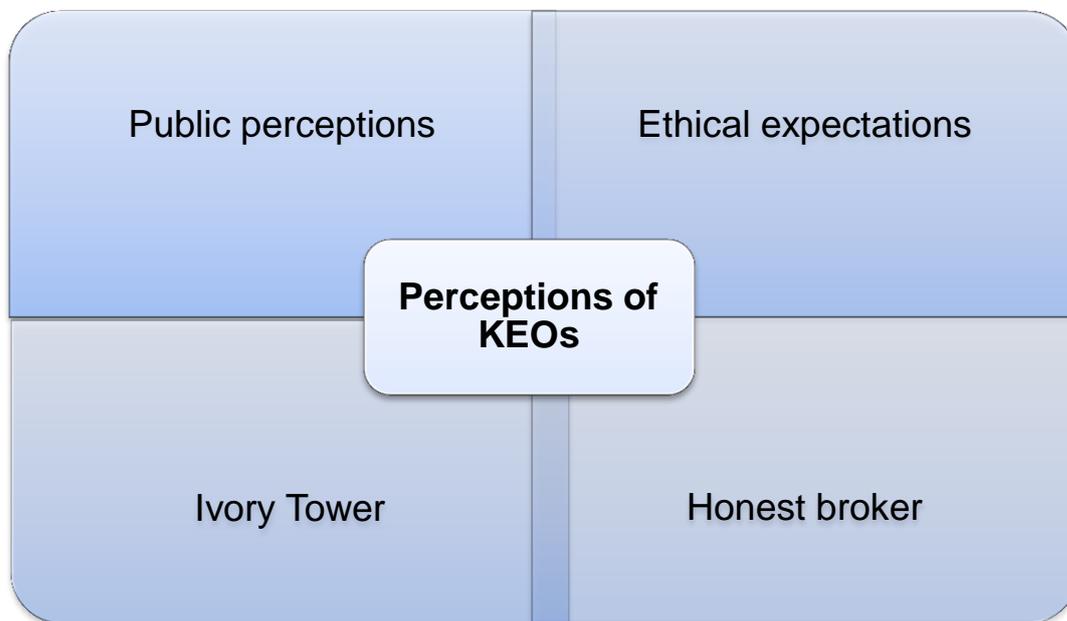
Figure 4.2 Perceptions of KEOs

Different parts of public saw KEOs in different ways, depending on age and their individual experience. The public would think of top universities based primarily on Oxbridge and Russell Group criteria. The public thought one university was like another and did not see distinctions among them, how different universities had varying roles in different parts of the UK, that there was clear differentiation among them. Most people would not know much about KEOs, other than that they provided education for graduates; they would be unaware of the extent of the research that KEOs undertook, that they were trying to make a difference. In some parts of society, universities were seen as factories that produced knowledge that could be applied, and the knowledge exchange practitioner's role was to make the knowledge valuable.

> *"If I were to say to you what are the top 30 universities in Britain, you could come up with a list, and it would be based on primarily the Russell Group, and it would be based on, on perceptions of the utility of their research."*
> (Interviewee No.1–Post-1992 university)

In the past, KEOs had been seen themselves as the source of all knowledge and business had not liked this. This was now changing and KEOs realised that they could benefit and learn from business. Some public organisations felt that management consultants had taken advantage of them, and they trusted KEOs to do an honest job, to apply academic rigour and have ethical standards. Business could be ambivalent about KEOs; some companies were enthusiastic about engaging with academics and others were more disparaging. Business sometimes argued that they had paid for research through corporation tax, and KEOs should provide services and access to their knowledge for free. On the other hand, KEOs were seen as risk averse, hard to work with and unreasonable: KEOs were not streamlined or responsive enough to deal with small companies. Big corporates tended to treat KEOs like their other suppliers and expected them to accept their standard contract terms. Some businesses, however, were starting to appreciate what KEOs could offer and do for them. KEOs were a resource for business, providing access to networks and to new ideas they could not find anywhere else. Although perceptions often lagged behind changes in practice, widening participation and the growth in the number of KEOs were now changing opinions about KEOs.

> *"…. that because of this past arrogance from universities and I found exactly the same at the time when I first went there, that they thought they were the fount of all knowledge, and that's the view from the vast majority of commercial people in the UK, that they don't like the arrogance of the academic sector, whether it be in the universities or in government laboratories."* (Interviewee No.34–KEO-Other)

"I think they really trust us to do an honest job as it were. … the word 'ethics' comes up ….. they probably expect us to not rip them off, whether they expect us to be incredibly cheap, that's unrealistic, but they know we're not going to rip them off. So, if you compare us, for instance to some commercial competitors, either in technical services or indeed in management consulting, I think their image isn't always that positive, particularly amongst SMEs [small and medium-sized enterprises]*."* (Interviewee No.29–Post-1992 university)

"I *think there's a perception that we'll be free. People don't understand… we'll be free and, but we are generally expensive, because of the overheads of the business, and the way the businesses are set up. They're not necessarily, apart from some universities, streamlined enough to deal with the small activities and working with the SMEs. It's not necessarily responsive enough etc. Whereas the big corporates have got probably a little bit more of lead time, so they're a little bit more relaxed."* (Interviewee No.15–Post-1992 university)

The public expected KEOs to behave as ethically as any big corporate or an NHS Trust. If KEOs did something wrong, they should be open about it, would rectify the position and hold themselves to up to account. On the other hand, more educated people thought that KEOs were as corrupt as everyone else. Some interviewees commented that the public did not have any ethical expectations of KEOs and did not have any concern about their ethical behaviour until the LSE – Libya crisis (Matthews 1 December 2011). The public saw some KEOs collaborating with possibly questionable partners, manipulating data and receiving strange gifts. The public reaction to the LSE-Libya crisis highlighted how the public expected KEOs to have higher ethical standards. The founding of universities had been based on neutrality, steadfastness, reliability and strong reputations, and there seemed to be something implicit in a KEO which meant that academics behaved in an ethical, moral way. Table 4.1 illustrates the range of ethical expectations placed on KEOs.

Ethical expectations of KEOs
"I think Joe Public expects universities to behave ethically in the same way as they would expect Pfizer or Procter and Gamble or Rolls Royce or the hospital, the NHS Trust." (Interviewee No.28-Pre-1992 university)
"Those are three things, getting into bed with dodgy partners, mass manipulation of data, and receiving strange gifts. But apart from that, I would not think the public would ever consider much about it." (Interviewee No.2-Post-1992 university)
"I think we do hold the same standard to everybody, I'm just saying this is wrong. When it's exposed, we go, "this is wrong, you shouldn't be doing it", and we try to rectify it. All I'm saying is, may be universities hold themselves in better light, and quite often you don't see a lot of scandal with universities, that you do with everyone else." (Interviewee No.4-Pre-1992 university)
"The founding of universities was based... in the church wasn't it? It's [an] *ivory tower, there's always loads of criticism, but it actually meant the people were aloof or somehow neutral or somehow... but rather than being maybe like the fads... winds of fashion, were quite steady in their beliefs, the way they approached life, so you could say there is a reliability, the reputation there that wasn't, of money, or governments."* (Interviewee No.20-Post-1992 university)
"I have to say, my experience is that universities are not as ethical as they think they are. I think business is more, you know, I never saw any dodgy dealing going on." (Interviewee No.8-Post-1992 university)

Table 4.1 Ethical expectations of KEOs

Table 4.1 illustrates how knowledge exchange practitioners understand public perceptions and the ethical expectations of KEOs' behaviour. Some of the interviewees' comments indicate that the public expected KEOs to hold the same kind of ethical expectations as business or other parts of the public sector. A knowledge exchange practitioner expressed a view that KEOs were seen as being different ethically, holding themselves to higher standards; another interviewee disagreed with this, believing that business was more ethical than KEOs.

The media tended to still portray academics and researchers as boffins, or KEOs as ivory towers doing irrelevant research. KEOs were seen as elitist and remote from the rest of the community. Many KEOs were seen as too busy to solve or provide practical advice on the problems that SMEs faced. KEOs were seen as arbiters of truth and knowledge; academics pursued research, knowledge for its own sake, its own value. The pursuit of truth was critical, independent of and uninfluenced by commercial or political interests. Academics were driven by curiosity and objectivity, breaking frontiers of knowledge; that is where their value lay. KEOs were seen as independent arbiters and this was expressed in several

ways: KEOs were impartial players and honest brokers, trusted intermediaries who provided something of quality. The concept of KEOs as a neutral public space was also important and was linked to KEOs' role as a central hub in the community which was explored in Section 4.2.1.

Knowledge exchange practitioners' views on public perceptions of KEOs echo the literature. There are still some perceptions of academics as remote and who do not understand the real world (Lockett et al. 2008). On the other hand, Chatterton (2000) argues that many KEOs are being pushed out of their ivory towers by changes in their staff profiles and changing student population; KEOs are being encouraged to open their facilities to the local community (Chatterton 2000). Kitson et al (2009) promote the idea of the "'connected university" by using eight case studies as examples of where KEOs are developing broader interactions with businesses, and attracting foreign investment into their communities (Kitson et al. 2009).

Having understood how knowledge exchange practitioners understand the roles of KEOs, the discussion in the next section focuses on the dimensions of knowledge exchange.

4.3 Dimensions of knowledge exchange

Knowledge exchange is one of the three main roles of KEOs (Jongbloed et al. 2008). Scope, drivers and benefits emerged from the research findings as three dimensions of knowledge exchange (see Figure 4.3) and these are explored in this section. Drivers and benefits offered interlinked perspectives on the extent and limits of knowledge exchange.
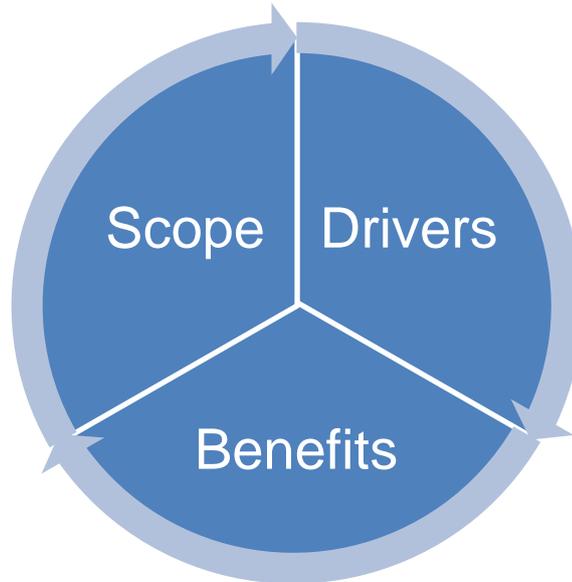
Figure 4.3 Dimensions of knowledge exchange

4.3.1 Scope of knowledge exchange

Within Figure 4.3 there were five ways of exploring the scope of knowledge exchange: defining it, exploring the kinds of activities that it comprised, looking at the interface between knowledge exchange and research, seeing knowledge exchange as a process and understanding the position of knowledge exchange in the KEO. Different definitions of knowledge exchange emerged from the research findings and the main themes of these are summarised in Table 4.2.

Knowledge exchange Definitions – Themes	
By activity	Research collaborations, partnerships, technology transfer, research commercialisation, and business development
Position of knowledge exchange in KEOs	Third mission, running a business unit, reach out, outreach, enterprise research and enterprise, enterprise and business development, business engagement, and innovation, innovation services, open innovation
A process	Translating, brokering, relationships with researcher users, understanding and translating business needs, building relationships, using what is learnt from working with industry in teaching and research, using and exploiting research outputs, forming relationships, learning from engaging and working with business, engaging with employers, knowledge socialisation process, and impact process, impact pathway, impact agenda
Nature of the relationship	Two way exchange, mutual benefits, reciprocal, dialogue with research users, collaboration, continuing dialogue, collaborative relationships, and social enterprise
Outcomes/results	Making a difference, adding value to knowledge, broadening the knowledge base, getting knowledge out, learning from external organisations as well as sharing their knowledge, feedback loop into research, creating social benefits, and helping people to develop economic and social capital from the research base

Table 4.2 Main themes in definitions of knowledge exchange

Table 4.2 shows that knowledge exchange was defined in several ways: according to the nature of the activities that come within the scope of knowledge exchange, the position of knowledge exchange in the KEO, as a process, and the outcome or results of knowledge exchange. Table 4.2 shows that the terms and language that knowledge exchange practitioners used reflected shared understandings, albeit with different emphases. A broader description of knowledge exchange was:

> *"... improving social and economic capital through application of publicly funded research."* (Interviewee No.24-KEO-Other)

Some definitions of knowledge exchange referred to "academic engagement", "business interactions", "partnerships" and "anything that engages with business". Other descriptions referred to particular forms of knowledge exchange, such as research collaborations, Knowledge Transfer Partnerships (KTPs) or spinout companies. Other synonyms were used to describe knowledge exchange,

although terms such as "enterprise" and "technology transfer" tended to predominate.

In one KEO, the language used to describe knowledge exchange varied internally and externally to reflect the terminology which their funders used.

> "... *some of the language we use, we have to use to reflect the knowledge of some of our funders, so for example we're just finishing the application of an EPSRC knowledge transfer account. So we use their language.*" (Interviewee No.18–Pre-1992 university)

Definitions of knowledge exchange were compared and contrasted with understanding and experience of knowledge transfer. These are summarised in Table 4.3.

Definitions of knowledge transfer
Transfer of knowledge, information from the academic knowledge base, to benefit society via patents, dissemination or public engagement
From universities to public or society through businesses
Exploitation of research outputs
STEM activity
Trying to protect, exploit, commercialise and apply intellectual property
Knowledge transfer is about protected intellectual property
Knowledge transfer Partnerships (KTPs)
Seen as spinouts
One off, episodic
Active and chosen process of moving a piece of research which has utility outside
Rational process of assessing where the best value of a piece of research knowledge, know-how or other knowledge and capabilities in a KEO is
Conscious selection for the purposes of extracting value
Means one way
A process - looking at real value of a piece of knowledge, how does it link with external world.
Another way of saying tech transfer. Knowledge management was fashionable 20 years ago and we're now using TT [technology transfer]; sounds old fashioned.

Table 4.3 Definitions of knowledge transfer

Table 4.3 illustrates how knowledge transfer is understood in varied ways. The definitions of knowledge transfer tended to emphasise its one-off episodic nature. Knowledge transfer tended to involve transactions which exploited and commercialised intellectual property, aiming to extract as much value as possible

from a piece of research or knowledge. On the other hand descriptions of knowledge exchange emphasised the two way process, interaction between KEOs, academics, and the outside world, as part of building relationships with external organisations. Interviewee No.17 explained:

> *"I prefer the term "exchange" because "transfer" to me, just being like a one way, knowledge back to the, outside the organisation, whereas "exchange" infers that both parties are both getting out of it, and I feel that's really true."* (Interviewee No.17–Pre-1992 university)

Some definitions of both knowledge exchange and knowledge transfer illustrate that knowledge could be treated as a commodity.

> *"... it's about dissemination of knowledge. From the knowledge exchange professional perspective, it's not just encouraging and supporting the dissemination of knowledge, but making sure it's applied to where it has some economic value, either directly or indirectly. And at the harder end of the spectrum, it's actually creating some revenue for the institution."* (Interviewee No.5-Pre-1992 university)

This kind of approach illustrates how knowledge can be used to create value; it is seen as a commodity that can be exploited for economic gain, whether for the KEO, a particular business or society more generally. This reflects debate in the literature about the emergence of the knowledge economy and how KEOs are major players in this (Antonelli 2008). Howard (2005) describes how KEOs are seen as significant suppliers of knowledge in the knowledge economy and can trade their knowledge to generate income (Howard 2005, p.3).

In the research findings, another way of exploring the breadth of knowledge exchange was to consider the activities which it embraced. Knowledge exchange involved a wide range of activities as Table 4.4 illustrates.

Knowledge exchange activities	
Consultancy	CPD (Continuing Professional Development)
Collaborative R&D	Community engagement
Internships for students	Student enterprise
Contract research	Co-development of intellectual property
Regeneration activities	Use of facilities
Setting up spinout companies	Licensing intellectual property
KTPs	Short courses
Secondments	

Table 4.4 Range of knowledge exchange activities

Knowledge exchange activities could be understood as a continuum ranging from student graduate projects to hard end consultancy, from public and community engagement to technology transfer. Interviewee No.5 expressed this clearly when they commented:

> *"Knowledge exchange to my mind includes everything from employer engagement, and things like internships placements, CPD, that area, all the way through to tech transfer, licensing, spinouts, technology."* (Interviewee No.5–Pre-1992 university)

The research findings suggested that an alternative way of understanding the scope of knowledge exchange activities was to see them as a spectrum, as Figure 4.4 shows. Interviewee No.3 (Post-1992 university) asserted that the nature of the intellectual property determined whether it was classified as knowledge exchange, knowledge transfer or technology transfer. Activities that involved tacit or softer intellectual property were classified as knowledge exchange. Exploiting codified or registered intellectual property such as patents through licensing and spinouts was classified as technology transfer. Taking this one step further, knowledge exchange and technology transfer activities could be mapped against the degree of "softness" or "hardness" of the intellectual property that was being applied. This provided a starting point for developing a framework for reflecting the range of knowledge exchange activities; this is illustrated in Figure 4.4.

Community &
Public
engagement
Facilities hire
Lectures &
exhibitions

Consultancy

KTPs

Collaborative
research

Contract
research

Tech
transfer
Spinouts &
Licensing

No IP

Knowhow

Copyright
Designs

Software

Hard IP
Patents
Trademar

Tacit
knowledge

Explicit
knowledge
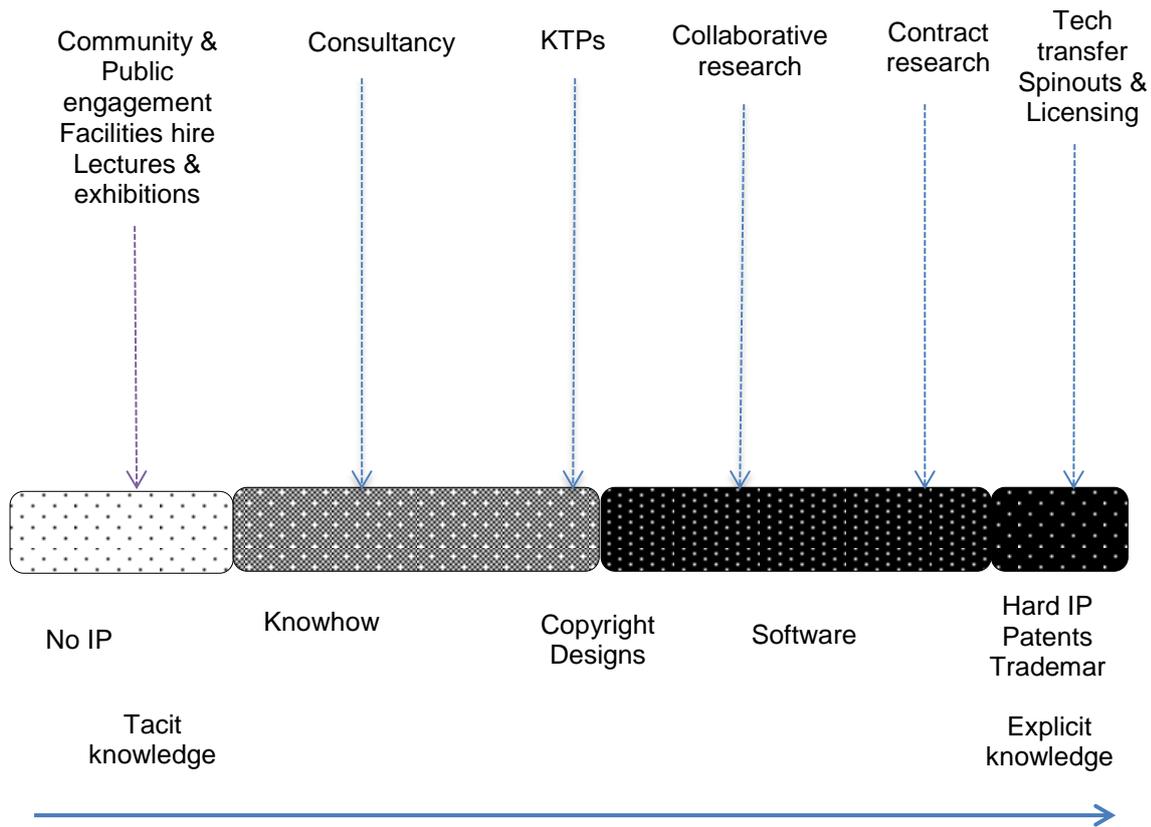
Figure 4.4 Range of knowledge exchange activities and degree of certainty of intellectual property

The model shown in Figure 4.4 has parallels with the model which Abreu and Grinevich (2012) have developed. The implications of this are discussed in Section 6.3.1 (pp.182-184).

Traditionally, knowledge exchange was seen as a part of a linear process that included teaching and research. Knowledge exchange was undertaken after these activities were completed, where a KEO tried to protect, commercialise, apply and exploit knowledge. This was particularly so in STEM, where the knowledge developed in research was used to help business to create new products and services. This approach reflected studies in the literature where similar pipeline models are described (Ulhoi et al. 2012). Terminology and processes used in knowledge exchange reflected those used in STEM. Knowledge exchange processes in social sciences, arts and humanities differed. As one of the interviewees highlighted, knowledge exchange in social sciences

was about influencing policy, and public and political debate about issues rather than creating new products and services.

> *"No, it's also because knowledge exchange and social sciences as well …… They would probably think of it in terms of … informing policy or informing practice. So, how do you influence government analysts or policy makers? How do you network with them? How do you produce your findings in a way that one comes to a conclusion about what the public policy options might be. That's really hard."* (Interviewee No.7–PSRE)

Research was often based on an academic's professional discipline where results from work undertaken with an outside organisation could provide a starting point for research. One interviewee expressed this:

> *"But more often than not, in subjects that are social sciences or arts and humanities, or education, what happens is in many of those is that the research comes from the practice based that you're doing with external partners. So many practice based disciplines, the research comes after the work that's been done for an organisation. It provides the results that form the thinking for the research rather than the other way round."* (Interviewee No.14–Post-1992 university)

For social scientists, knowledge exchange was not necessarily separate from the research process. Knowledge exchange could happen before research started; an academic needed to engage with research users to shape research questions: this was a continuous process, with knowledge exchange as a stage in undertaking research.

> *"… but it's also a means of determining your research questions. It's quite reflexive, you would talk to say the Home Office, and say, "what is your issue?", and you would say, "you're not asking the right questions, this is what you need to ask", and then that can inform a programme for research. So it's the whole thing of embedding it, working with users right at the outset and working with them. Take it right through from the start and build knowledge exchange into it."* (Interviewee No.7–PSRE)

> *"We see knowledge exchange itself as a research process. So the original approach, the strategy document I created talked about embedding it within the research process itself through the reference groups, through the advisory boards, through the online engagement, through the KE [knowledge exchange] activities."* (Interviewee No.12–KEO-Other)

Research was an evolution, not a linear process and knowledge exchange was part of the research cycle, particularly when outputs from research were used as they arose; the outputs were fed back into the research. So knowledge exchange provided a feedback loop into research, formed an iterative process with research.

> *".... what it confirmed to me is research is not a linear process, it's an evolution, and it works best when outputs are used at the point at which they arrive, we actually have quite a few academics here that also subscribe to this. As you go through the process, you're working on... they're working on a number of things anyway, they're not just working on their one grant, and as the outputs come, that's the point at which they will take it off and go and talk to a company about doing some work with them around it, or they will look to patent it."* (Interviewee No.28–Pre-1992 university)

As in social sciences, the boundaries between knowledge exchange and research could be blurred; feedback between applied and blue sky research formed a dialogue between knowledge exchange and research. Research on real life problems could lead to understandings in pure science, a feedback loop where developments in applied research could lead to understandings in pure research.

> *"There is iteration between the two* [pure and applied research]. *We came across an extremely good example in the case of a university and Rolls Royce with the creation of the discipline of unsteady fluid dynamics. It was trying to understand a real world problem but led to the fundamental understandings involved in unsteady fluid dynamics, and then iterated back round again."* (Interviewee No.24–KEO-Other)

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KTPs were an example where research and knowledge exchange were integrated, where the academic had to engage with research users and use their feedback as input to the future development of the research.

> *"KTPs are really good example of that, because what we actually demand of the academic partner and the whole partnership right from the outset of the project, they are consciously building into their plan, what the academics will get as benefit from it. So, we want them to be deliberately looking to see what they can learn about the ways in which their research outcomes can be commercialised, and what that then tells them and feeds back into further rounds of research, the next steps, as well as what they're going to do in their teaching etc."*
> (Interviewee No.22–KEO-Other)

Industry had much to offer KEOs from the start of a research programme. In doing so, KEOs could identify future research areas, and industry benefitted from gaining academic contacts. Academics were realising that working with external organisations could inform their research and teaching. This reinforced the understanding of knowledge exchange as a two way process.

These findings echo the more complex, dynamic models of knowledge exchange which scholars have started to propose. Davies et al (2008) argue that "knowledge interaction", rather than "knowledge exchange" or "knowledge transfer", is a better term to use in the social sciences to reflect the many actors and sources of knowledge involved (Davies et al. 2008). Other scholars are attempting to integrate different models of knowledge exchange or variations on this term, such as research communication, knowledge mobilisation, brokering, translation, and intermediation. Shaxon et al (2012) propose the term K* (KStar) as an overarching concept to encompass all these different terms, and to describe the functions involved in sharing knowledge among different stakeholders (Shaxon et al. 2012).

The research findings revealed another way of approaching knowledge exchange by seeing it as a process or a series of related steps. As a process, knowledge exchange involved looking at a piece of knowledge, assessing its potential for use outside the KEO, protecting and exploiting it.

> *"…. knowledge transfer is that rational process of assessing where the best value of a piece of research knowledge, know-how or other knowledge and capabilities in a university is."* (Interviewee No.1–Post-1992 university)

This could often involve some kind of a gate process where potential opportunities, projects and deals were assessed regularly for their future viability and likely return as they were progressed.

> *"…. we have quite a rigorous stage gate process, but that is largely run through my group. So it's a peer review panel before you do anything to do with patenting, and at which we also discuss licence terms before we actually do the licence."* (Interviewee No 6–Pre-1992 university)

In this way, knowledge exchange was about raising awareness about a piece of research, giving others an opportunity to discuss it, and possibly extend it.

> *"Well, one thing we do straightaway is we make knowledge of that research available to those people who are able to consume it. This isn't about publication, this is about letting those people know who can contribute to the debates surrounding the research. Awareness of the research and its implications, and an opportunity to have dialogue about it, and even to extend it."* (Interviewee No.1–Post-1992 university)

Knowledge exchange involved combinations of different kinds of activities which were undertaken to maximise the research.

> *"…. developing different techniques and different combinations of different types of activities that would complement and maximise, depending on the kind of research we were doing."* (Interviewee No.12–KEO-Other)

In this way knowledge exchange could be seen as a social process, where research users could stand to benefit. This could involve adapting particular research outputs to meet particular needs; for example, focusing on how a flow from research to benefitting health generally could be a more effective approach to convince doctors of the benefits of knowledge exchange.

> *"Doctors involving clinical research hated the word 'exploitation' so we had to re-analyse the paradigm, basically said 'You're interested in public health benefits, we can only develop public health benefits if a value chain exists that will sustain the flow from research to application' and therefore you should look at any return on investment in that value chain as being a sign that those public health benefits are being delivered. But it's necessary to make the investment so that they can be delivered, but the return is then only a signal that public health benefits are being delivered."* (Interviewee No.24–KEO-Other)

The role and scope of knowledge exchange varied among KEOs. In some KEOs, knowledge exchange was integrated with research and teaching: knowledge exchange activities had to fit with the KEO's research activities to persuade academics to get involved.

> *"Now here, the business development activities, which we undertake, are very much driven by our research. So, … it's to ensure that our academics want to participate in those activities. And if we're to interest them in working with businesses, then generally, they'll welcome that more if they can see opportunities to coalesce their research interests with those projects with companies."* (Interviewee No.10-Pre-1992 university)

Some KEOs had integrated knowledge exchange into their corporate strategy and saw knowledge exchange as embedded with research and teaching, underpinning all their activities. Knowledge exchange was often seen as an inherent part of the KEO, a core part of the KEO's activities, embedded in and integrated with research and teaching.

> *" …. so if you look at the university's strategy they're now going into, it's no longer looked as a separate third pillar out here. It's that it's actually understood* [that] *it's a key element of both the research and the education, and it has to be integrated. We aren't a separate thing over there, we are embedded in both of these."* (Interviewee No.27_1-Pre-1992 university)

Some KEOs saw and managed knowledge exchange as an area that was separate from research and teaching. This was also reflected in the roles of ethics committees, as will be seen in Section 5.4.4 (pp.157-159). The position of

knowledge exchange in the KEO reflected the rationale for undertaking it and this is discussed in the next section.

4.3.2 Knowledge exchange drivers

When exploring the rationale for or drivers of knowledge exchange, three themes emerged from the data: Government policy to encourage KEOs to contribute to economic growth, generating income, and co-creating knowledge.

The Government believed that KEOs had a wider role to play in the UK economy; applying the outputs and results of research would create more wealth for the UK and strengthen the case for publicly funded investment in research. The Government's approach was underpinned by two beliefs about KEOs where much of the discussion was round the extent to which KEOs created value which they did not exploit, or were not very efficient or effective in exploiting.

> *"First of all, from the political side, there is a belief that somehow universities can pay for themselves. And so a good deal of the debate around this is to do with the extent to which universities create value which they don't exploit. We all have this, the argument that we're too slow to get things out of the door, that we could, that we're just not slick enough and all the rest of it. Another very important part of this whole political debate it seems to me is to do with the utility of knowledge."* (Interviewee No.1-Post-1992 university)

This finding is reflected in other studies. Benneworth and Jongbloed (2010) assert that as KEOs receive public funding, they must be accountable for it, show value for money, and prove the wider benefits that society receives from such investment (Benneworth and Jongbloed 2010). Boulton and Lucas (2011) argue that European governments and the European Commission believe that there is a direct link between applying KEO research and national wealth (Boulton and Lucas 2011; Lynskey 2013). Lockett et al (2015) demonstrate how successive Governments have enshrined this approach into official policy (Lockett et al. 2015). KEOs have a responsibility to undertake research that can benefit the economy, and only this kind of research should be funded, so that KEOs can generate "useful" knowledge (Boulton and Lucas 2011; Lynskey 2013).

From this perspective knowledge exchange can be seen as a process of deciding the real value of a piece of research or knowledge, whether and how the outside world can use it, and determining the stage of its development and how best to protect it.

> *".... we would view the process that we go through when we look at a piece of research and see whether or not there is potential to make use of It outside the institution... go through a process which is a process of saying "OK, what is the real value of this, how does it connect with the outside world, is it yet at a stage which is fully developed, what kinds of protection do I need to put in place?"* (Interviewee No.1–Post-1992 university)

The Government wanted to create a perception of being seen to care about science because it thought that it generated revenues; involving KEOs in creating economic impact led to greater wealth creation in the UK. The technology which KEOs produced was transferred to business, giving it a competitive edge, so companies were more successful. So the Government wanted the best possible interaction between KEOs. Their aim was to encourage multinational companies to invest in research and development in the UK, undertake business here and create more employment.

> *"BIS [Department for Business, Innovation & Skills] want the best interaction that they can get with the research base and the academic base in the UK to foster companies doing research and development, putting money into the UK, seeing that the UK is a good place to do business, and from that research and development the best place then to actually do the manufacturing would be the UK in many of these cases, where there's the high added value."* (Interviewee No.32–PSRE)

This was done in two ways: creating a reputation for the UK as a leader in innovation and creative work, and demonstrating to foreign companies that the UK was open to investment. The Government saw KEOs as a resource to attract organisations looking to do business in the UK and by working with UK-based business, KEOs could help them grow and so support the economy.

> *"I think more and more Government is seeing us as a resource to attract investment and other organisations looking at the UK as a place to do business."* (Interviewee No.32–PSRE)

At the same time the creation of national science and innovation campuses such as those at Daresbury, Harwell and Babraham, near Cambridge were drivers for KEOs to create impact by using their technologies to attract companies to co-locate, so demonstrating to Government that taxpayer investment was producing a return.

> *"…. certainly in the last six years one of the main delivery points for the impact from research has been the two national science innovation campuses, so it's incredibly important for us that we use the technology that we have access to as an attractor for companies to locate on the campus."* (Interviewee No.33-PSRE)

KEOs followed this Government agenda as they wanted to be seen as still relevant to ensure future funding for publicly funded research.

> *"…. if we don't do it* [knowledge exchange] *and we're not seen to be doing it by Government, then there's a strong chance that we're irrelevant to the government's agenda."* (Interviewee No.32–PSRE)

The research findings echo the approach of the triple helix model where Government, industry and KEOs collaborate in knowledge exchange, and are interlinked in the development, dissemination and exchange of knowledge (Etzkowitz et al. 2000). Howard (2011) believes that growing interactions between government, business and industry support the idea of the triple helix (Howard 2011). However, Kelly (2008) questions whether this kind of approach is realistic, whether KEOs' roles can be changed with those of government and industry (Kelly 2008).

Another driver for KEOs to undertake knowledge exchange was to generate additional income to replace cuts in public funding. KEOs had found that the income stream and profits from setting up spinout companies were less significant than they had anticipated. As KEOs' income levels determined the allocation of funding for knowledge exchange, KEOs had to find other, more

immediate ways of generating funding. KEOs were set financial targets for generating research income, including research council income. Interviewee No.25 observed:

> *"…. well for the university, they have targets set by government for income generation and for engagement. So they need to meet those. Income generation's been motivating all the universities because the amount of recipient income levels determines how much HE Innovation Fund and knowledge exchange, innovation funding we get. It puts you on league tables. So senior managers, vice chancellors and deputy vice chancellor have this very close to their hearts."* (Interviewee No.25–Post-1992 university)

Other scholars have concluded that raising income is a motive for KEOs to undertake knowledge exchange. Martin and Turner (2010) argue that KEOs undertake knowledge exchange to generate income; many knowledge exchange practitioners have some kind of income target (Martin and Turner 2010). Abdul Razak et al (2014) show that KEOs are expected to develop new sources of income as well as contribute to economic growth (Abdul Razak et al. 2014). Lockett et al's (2015) longitudinal study of knowledge exchange activities between 1994 and 2008 in UK universities finds an increasing emphasis on potential financial gains and on attracting new funding (Lockett et al. 2015).

Another third driver for KEOs to undertake knowledge exchange was the attraction of co-creating knowledge by working with external organisations. This helped academics to ensure their research was leading edge, disseminated and applied in the real world.

> *"…. for me, the driver is simply that, it's fascinating and I like to learn. It really is that. When I sort of analyse why I do things, it's because I think that, "Ooh, that'll be fun." And the fun bit is challenging your ideas and learning, and sharing what you know and getting other people to learn. So, that's really where that's come from."* (Interviewee No.25–Post-1992 university)

With the coming of impact, academics were increasingly expected to promote their discipline and apply it to the outside world through public outreach or engaging with business.

"So I think every academic's job is to promote their subject area, and, what I would say, concept, not conceptualise, I think is just apply it to the modern world somehow, whether that's through public outreach, whether that's working with businesses, I think everyone can't just sit there and do nothing." (Interviewee No.15–Post-1992 university)

"… but it's all within the same sort of thinking of making sure that all our researchers are out thinking and thinking of where they can make a difference." (Interviewee No.18-Pre-1992 university)

Academics were starting to see how knowledge exchange could benefit their research and their career, how working with outside organisations could raise their profile, credibility and reputation. In building relationships with external organisations, academics learnt about the needs of business and this could influence how they developed their future research. Getting recognition, getting their research used in some way and finding partners for future research were real motivators for academics; knowledge exchange was seen as a mean to achieve these.

"…. some of the work has shown academics and certainly some of the academics that I've spoken to, it's highlighted the value of their work and, actually some of them embracing a lot of the work that we do a lot more, because actually it highlights the value the work, it builds the profile and it's more exciting to actually work with external organisations." (Interviewee No.27_2- Pre-1992 university)

Knowledge exchange was encouraging academics to engage with research users and collaborate with external organisations. This was one of the benefits of the growing significance of knowledge exchange, an area which is explored in the next section.

4.3.3 Knowledge exchange benefits and impact

Knowledge exchange drivers were also knowledge exchange benefits; they were two sides of the same coin. The push to encourage KEOs and academics to think about the "impact" of their research could be both a driver and a benefit; to

be able to demonstrate the results of the research that KEOs had undertaken, and how it had been applied and benefitted someone or something.

"Impact" could be approached and defined in different ways, such as making a difference, an invention that had changed the world, or as some kind of "benefit". This meant getting the outputs or the results of research used in some way, applying and making sense of research so that people outside the KEO could understand and use it.

Academics could create different kinds of impact from their research such as academic, and economic and societal impact (Economic and Social Research Council (ESRC) 2014) or as instrumental (influencing a change in policy or in practice) and conceptual (helping to shift debate round an issue) (Economic and Social Research Council (ESRC) 2014). Impact in STEM and the social sciences differed. The impact of research in STEM could be identified more easily; it was more tangible; for example, it could be a new product or service, a new process, creating new jobs by establishing a spinout company. In the social sciences, it was harder to trace the impact of research; it was more intangible and more indirect. It might not be directly linked to the research; an academic could be contributing to influencing debates and making people think about them.

> *"What we've found in the work that we've done on impact …. so it's really hard for social science impact, to unpick it, because, for example, if you were to spinout a company, or you to spin, protect a technology, and spin that out, you could identify it, you could protect it. But with social science, you might be kind of contributing to shifting debates and making people think about them. And it might not just be directly linked to your research, more instrumental. My researchers find that people do X, therefore if you want them to not do X, then you have to do Y. That's a kind of instrumental impact that social scientists, there's a holy grail. It's much rarer than the kind of conceptual impact which is around, actually the way that you've researched that in your findings have shifted the way I've approached this, or it's may be thinking about it differently, or it's moved the debate on, and changed the direction of it."* (Interviewee No.7–PSRE)

One of the key features of impact was that academics often needed to work with research users. So academics were not solely responsible for creating impact;

external organisations influenced by some change from the research were. As Interviewee No.24 observed:

> *"The two big misunderstandings inherent, that have been created in the academic community in my view, and there's been a big challenge here, is that first of all it is the academics that are responsible for impact; they're not. External organisations influenced by some change from the research are responsible for creating the impact. Because you need to conceptualise impact as a real change in the outside world, therefore something in the outside world has got to change, as a result of being influenced by the research."* **(**Interviewee No 24-KEO-Other**)**

This reflects other studies: impact involves many factors that KEOs cannot control. Academics cannot control the impact their research may have; their influence on policy may not be identifiable or traceable, particularly in social sciences (Kelly 2008; Watermeyer 2012; Bannister and Hardill 2013).

Another way of considering or looking at impact was that since the mid-2000s, the Government had wanted to see what they were getting for the funding invested in KEOs; there was a very big push towards justifying the money put into research and demonstrating the return on the investment.

> *"I'm engaging* [in] *it because I think economic impact is a good thing because it leads to greater wealth creation in the UK society, for the UK investment in publicly funded research."* (Interviewee No.24-KEO-Other)

The introduction of impact by the Government and research funders such as BIS, HEFCE and the research councils had led to a change in culture in KEOs. It was about KEOs doing what they could with Government funding or investment in research to contribute to economic activity outside; KEOs were publicly accountable.

> *"I think, the motive, the driver is, the taxpayer's paying a lot of money towards research, so it's only fair to, for the universities to see how that research can benefit economic and societal development."* (Interviewee No 23-KEO-Other)

So it was the impact that KEOs could create and the impact stories that KEOs could send to BIS to make sure that their research was seen as relevant to the economy.

> *"We're a Government organisation so it's incumbent on us to be able to demonstrate to government and to the taxpaying public that the investment, this £600 million a year that they put into this place is actually returning, producing a return on our investment that has tangible benefits to the UK."* (Interviewee No.33–PSRE)

> *"I think there's a balance between, in this modern world, doing what the hell you like and getting lots of public money to do it, and actually taking some accountability and giving something back."* (Interviewee No.15–Post-1992 university)

So impact could be understood as a way of demonstrating the return on public investment in research, and showing how research that KEOs undertake could benefit economic and societal development. KEOs and academics were being asked to recognise that there was an implicit contract with the taxpayer, who funded their research, to engage with the outside world, to inform people about their research and to show how their research could benefit society. It was about KEOs and academics taking some accountability for how they used Government funding and giving something back by promoting their discipline area and applying it to the outside world. An interviewee summarised this.

> *"What we're asking academics to do is to accept that there is an implicit contract with the taxpayer who is funding them, to engage with the outside world in a way that does not compromise what they're there to do and to be."* (Interviewee No.24–KEO-Other)

The relationship between knowledge exchange and impact tended to be confused; knowledge exchange and impact could be seen as synonymous, or as separate. Knowledge exchange was seen as the process or means of translating the results of research for an external organisation; impact was the output or way of interpreting an outcome; it was longer term. Knowledge exchange was also a way to intervene to facilitate change, between research and something happening as a result of it. Knowledge exchange was the bridge between research and impact.

"So you do a project and you have an output at the end of it. So the knowledge exchange is the transfer of the knowledge, that's a process. And the impact is an outcome. So yes, one is process, and one is an outcome."
(Interviewee No.15–Post-1992 university)

"Impact is the way that something changes. Change can happen out of doing knowledge exchange, or a result at the end of it. Or knowledge exchange could be that happening, or providing that bridge or that link between something that's happened in research and how it might have an impact at the other end. knowledge exchange is an intervention or a catalyst, from the research stream produced to something happening." (Interviewee No.12–KEO-Other)

These perceptions of economic and societal impact are summarised in Table 4.5.

Economic and societal impact	
Economic impact	• More wealth creation, for UK investment in publicly funded research, and more employment, better jobs and lifestyles • Exploiting research for economic benefit • Improving economic and social capital by applying publicly funded research • Getting knowledge to business where it has the potential to improve products or enhance their revenue • Applying absorptive capacity of business to get economic value out of research • Attracting investment from multinational companies by showing that UK is the best place for doing business and R&D with highly skilled, knowledgeable people • Taking ideas, intellectual property from KEOs and finding ways of using them to generate economic activity • Generating tax revenues by transferring technology and intellectual property from KEOs to companies to give them a competitive edge and create jobs for highly skilled people • KEOs using their technology and ideas to attract companies to co-locate on their campuses, to show taxpayers that investment in KEOs produces a return and tangible benefits to the UK • Enabling companies to access new technologies and ideas generated by KEOs' research • Translating investment in research into things that benefit the economy
Social impact	• An invention or a technology which has changed the world • Ensuring relevance of research base and KEOs to society, economy and government • Further the development of society, societal development • Benefit to society, making a positive difference to society • Community power and engagement • Benefit that has a profound effect on a few or a strong effect on a very broad range - depth and range • Meeting people's economic and social needs • Links to local community, awareness of wider impact of research on society • Developing social impact from the research base • Creating health benefits for a population • Helping to develop social capital from the research base • Solve problems; provide the needs of the world or society • Environmental impact of economic activity • Translating investment in research into things that have societal benefit

Table 4.5 Definitions of economic and societal impact

The perceptions of economic impact refer to improving and benefitting the economy, creating jobs and more wealth. The perceptions of social impact refer to wider benefits, such as improving health and improving social conditions and empowering the community, ordinary people. These definitions of economic

impact reflect those in the literature. Kelly (2008) asserts that there is debate about whether "economic impact" can be understood to include cultural, quality of life and social impact (Kelly 2008). For Howard (2011), non-economic kinds of impact may be just as important as economic impact. Government and business also expect KEO research to influence or impact on strategy and policy (Howard 2011).

These research findings about knowledge exchange and impact indicate how impact is used as a means to encourage KEOs to account for how they use public funding for their research. KEOs are put under pressure to account for the funds they receive and maximise the return on public investment in research (Horowitz Gassol 2007; Markman et al. 2008; Bannister and Hardill 2013).

The next section explores the findings about how knowledge exchange practitioners understand how KEOs get involved with the world outside.

4.4 Engagement

This section explores how knowledge exchange practitioners understand how KEOs engage with stakeholders, and how KEOs connect with business as a particular set of stakeholders.

4.4.1 Stakeholders

In attempting to define "stakeholder", one definition was *"someone with a vested interest in something; it could be the organisation a KEO is engaging with, academics, administrators"* (Interviewee No.17-Pre-1992 university). Another interviewee insisted that KEO and knowledge exchange stakeholders were project specific or project dependent; a stakeholder was defined by who was needed, who had to be involved (Interviewee No.4-Pre-1992 university). An alternative approach was to use the term "customer" in knowledge exchange. Another view was that "stakeholders" could not be defined; once they were identified, others were excluded.

The concept of "stakeholder management" did not seem to exist within KEOs or, where it was recognised, it tended to be undertaken informally and episodically,

on an ad hoc basis. Although it could seem that leading KEOs had increasingly realised the importance of stakeholders since 2000 and had implemented detailed stakeholder plans, the data indicated that this might not be widespread. Other KEOs did not have any significant stakeholder initiatives; some vice chancellors had decided that academic freedom meant letting individual academics, who believed that they 'owned' particular stakeholder relationships, take the lead. Another KEO did not have a stakeholder plan; it was developing more strategic engagement with stakeholders, those whom the KEO wanted to influence and with whom it wanted to work. Although some KEOs worked closely with other local KEOs, local authorities and chambers of commerce, they saw it as part of the KEO's engagement, and did not refer to it as stakeholder management. For some KEOs, business stakeholders tended to be more local than national, such as business and enterprise groups in the city. As KEOs were sometimes the only institution in a large area, they had to build strong relationships with their stakeholders. KEOs recognised that much of stakeholder management was about communication, making time to go out to talk to stakeholders and to find out what they wanted the KEO to do, using a variety and range of mechanisms.

> *"I think the leading universities have significantly increased their realisation about the importance of stakeholders over the last 10, 15 years."* (Interviewee No.34–KEO-Other)

> *"… so we don't have a stakeholder plan, although we are developing more strategic engagement with stakeholders, both from who do we want to influence, how do we want to work with them."* (Interviewee No.14–Post-1992 university)

> *"…. with the local authority, with the chambers of commerce, deal with local communities, all those sort of organisations. We don't call it stakeholder engagement analysis or anything like that. We do all these things as part of our core engagements being very important to us."* (Interviewee No 20–Post-1992 university)

There was uncertainty whether KEO and knowledge exchange stakeholders overlapped. From one perspective, KEO and knowledge exchange shareholders were the same as knowledge exchange was central to a KEO's mission and knowledge exchange was embedded, aligned with academics' research interests,

not seen as a separate activity. On the other hand, KEO and knowledge exchange stakeholders overlapped, with a different emphasis or weight given to particular kinds of stakeholders.

> *"I think we have broadly the same sets of stakeholders, but maybe just different emphasis in some of those relationships."* (Interviewee No.5–Pre-1992 university)

In some instances, knowledge exchange stakeholders were seen as a subset of a KEO's stakeholders; some knowledge exchange stakeholders were relevant for other parts of the KEO; for example, knowledge exchange stakeholders usually comprised organisations that had an interest in the results or outcomes in of the KEO's research, research users, often business. As KEOs had different roles, so they could have different sets of stakeholders. The KEO itself and the various departments, schools, faculties and professional services could be seen as knowledge exchange stakeholders. Funders such as HEFCE, the research councils and charity funders were major stakeholders.

Some stakeholders such as BIS and Innovate UK had dual roles as stakeholders; both were funders. BIS also protected the interests of business and shareholders, and it determined Government spending policies and allocations for KEOs through HEFCE and the research councils. As a major funder of KEO-industry research collaborations, Innovate UK was also a major influence; it interacted with the research councils, KEOs and business, and advised the Government. The research councils were both funders and practitioners of knowledge exchange. The EU Commission and LEPs were also seen as significant influencers. As knowledge exchange had become more relevant since the introduction of impact, more companies were becoming involved in knowledge exchange and so were becoming more important stakeholders; for example, companies which had set up research centres on KEO campuses. Another perspective emphasised knowledge exchange's links with research, where research users were stakeholders in shaping research questions.

Stakeholders were involved in KEOs in different ways; for example they were invited to sit on their Councils or engaged in particular areas. As knowledge exchange stakeholders, funders were mandated to secure some kind of impact;

researchers had to identify stakeholders before applying for funding for research. KEOs interacted with their academic community through advisory and peer review panels which include academic and industry representation. The stakeholders which interviewees identified are set out in Table 4.6.

Stakeholder category	Stakeholders
KEOs	Students, academics, KEO professional staff, KEO departments, schools and faculties Key people the knowledge exchange office is engaging with, knowledge exchange clients / customers / companies that might exploit KEO research, other KEOs
Business	SMEs, large companies, LEPs, Chambers of Commerce
Community	Local authorities, including city councils, city/town/region, local community, local residents
Funders	HEFCE, Research councils, Innovate UK, Charity funders, such as Wellcome Trust, EU Commission, Venture capital companies / angels
Government	BIS, Government departments, sister organisations, Government offices like the Ministry of Defence (MOD) or Home Office, Devolved administrations, Policy makers / policy bodies
Other public sector	NHS, Sector skills councils
Third sector	Charities, Social enterprises

Table 4.6 Knowledge exchange/KEO stakeholders

The research findings show the application and relevance of stakeholder theory and stakeholder management in KEOs, and fit within the context of other studies in the literature. Scholars such as Jongbloed et al (2008) assert that KEOs' changing roles mean that they are engaging with and developing relationships with a broader range of organisations and communities (Jongbloed et al. 2008; Benneworth and Conway 2009). The research findings offer some insights into an area where there is potential for further research to be undertaken to offer more insights into how KEOs interact and relate with their stakeholders (Alves et al. 2010).

This section has explored how KEOs manage their stakeholders, attempted to identify KEO and knowledge exchange stakeholders, and how and whether there was any distinction between them. The next section explores research findings about how KEOs interact with a particular group of stakeholders, namely business, and when they decide to do so.

4.4.2 Collaborating with business

KEOs used a range of approaches and policies in how they collaborated with other organisations and companies. These methods ranged from "case by case" to implementing clearly defined strategies and policies, such as focusing on particular industry sectors or kinds of organisations, or determining which sectors or kinds of organisations that a KEO would not work with; for example, some KEOs had written policies about not working with tobacco and weaponry. Table 4.7 summarises the approaches, strategies and policies that KEO used in deciding how to collaborate with external organisations.

Approaches to working with external organisations	
No KEO policy. Ad hoc, debate on a case by case basis. No institutional processes or procedures or overall strategy, criteria. No strategic plan or account management	Do not work with tobacco and related companies and companies developing warheads
Choose companies that will allow KEO to generate more tangible impact	Focus on particular industry sectors - process industries and digital - targeting top 250 companies in the region
Work with SMEs but they tend to cost money to work with them as they generally do not buy full cost services, at least the first time round, and are looking for funding	Have priority sectors
Looking to work with organisations that are aligned with the KEO's existing research /academic interests so that it can take the research forward	Moving towards targeting particular companies and in particular sectors
Identify companies that are attractive to the KEO; tend to be larger companies with exciting prospects	Only regulations KEO has are not working with tobacco companies
Looking at 50 fastest growing companies in the region and targeting the top 20	Look to work with companies where the KEO already has links
Map where the KEO's strengths lie and how they align to different sectors and stakeholder groups. Look to engage with business where the KEO has real strength and depth in a discipline	Proactively identify companies KEO has links to work with
Would work with defence against chemical attack, not defence for attack	Will not necessarily refuse - KEO has some broad strategies
Now a move to targeting particular companies: growth companies, regional companies, and companies in particular sectors	Worked with any organisation who asked the KEO Now moving towards targeting particular companies
Support areas that have the potential to grow, where UK has capability in the area there a big global market, and the market ready is and big enough	Would not want to put KEO in a position where it could be openly criticised
Some clustering to working with companies around particular technology or science sectors. Also larger companies rather than SMEs are more likely to be able to afford to pay for cost of the organisation's facilities	Work with private corporates who approach the KEO on an ad hoc basis. KEO tends to target medium sized businesses - have emergent problems and are local
Organisations who are prepared to invest in the KEO	Not working on tissue - life sciences or testing on animals

Table 4.7 Approaches that KEOs use in deciding how to collaborate with external organisations

Taking a case by case approach was more common than developing and applying a coherent defined approach. However, some KEOs were starting to develop a more strategic approach, to consider where they could best invest their knowledge exchange resources, particularly with cuts in HEIF and other innovation funding streams. Other KEOs were developing strategies and more consistent approaches, such as looking at the fifty fastest growing companies in the region or particular sectors, such as financial services. Some KEOs took a combined approach, using ad hoc approaches by responding to companies who approached them and deliberately focusing on medium sized companies. Large corporates tended to have established suppliers already in place and KEOs faced difficulties in trying to break through this.

On the other hand, Table 4.8 demonstrates how KEOs applied a range of criteria, ranging from financial return to reputation, when deciding whether or not to collaborate with a company or organisation. From Table 4.7 (Approaches and strategies that KEOs use in deciding when to collaborate with other organisations) and Table 4.8 (Criteria), it seemed that there was some overlap between the strategies and approaches that KEO used in determining which organisations to work with and the criteria which KEOs used to help them make decisions about with whom to collaborate.

Criteria KEOs use in deciding to collaborate with an outside organisation	
What business an organisation is in	Organisation acts and behaves in ways consistent with what the KEO wants to be seen as an organisation
Not upsetting a major stakeholder, what the upcoming issues are, usually regional	Fit with KEO's vision for its campus
KEO can do the work consistent with its ethics policy	What the KEO's contribution would be, what it is being asked to do, whether the KEO can make a worthwhile contribution
Whether the KEO can offer something unique	Academics' views and preferences on which opportunities to follow
Low commercial risk	How the deal and the contract are structured and specific contract provisions
Objective of the work	Academic freedom to report results of research as they are
Source, purpose of the funding, what it is to be used for	Organisation can afford the KEO's charges
Organisation that KEO has a synergy with, chemistry, trust	Innovate UK or research council agrees to give funding to a company/organisation
An organisation is reputationally acceptable	Companies/organisations that will allow KEO to generate more tangible impact
The best way of using the knowledge effectively, getting the knowledge out there	Organisations that understand and are comfortable with the KEO's mission
The research will be robust and independent, that funding source will not compromise or constrain the research - is based on research integrity	What expertise the KEO already has/is needed and how it can get the most value of that expertise
What expertise the KEO already has is needed and how it can get the most value of that expertise	The KEO is comfortable dealing with the organisation/project
An organisation can add value to the KEO, what money they can invest in the KEO	Larger companies with interesting developments with whom the KEO already has existing links
Maintaining a core set of values which the KEO does want to step outside	Potential conflict with existing relationship or academic interest; for example, where KEO has a medical/health school and working with a tobacco company
A viable company selling products legally and appropriately. Company is registered in the UK, paying taxes in the UK and is not doing anything illegal or immoral	Does not feel right for the KEO, is inappropriate, risk of institutional damage

Table 4.8 Criteria which KEOs use to decide whether to work with other organisations

KEOs could not always choose with whom they wanted to collaborate; major organisations could be selective about which KEOs to work with, depending on a KEO's expertise, how fashionable the subject was and the source of the funding for the research. Some KEOs explained how they had declined to work with organisations as they did not want to be associated with them for political, ethical or reputational reasons. Another KEO wanted to work with organisations in ways that were consistent with their ethics policy, where they could make a worthwhile contribution, not just for the money. Other KEOs looked to work with organisations with which they had a synergy and where they were already doing research.

KEOs made decisions about whether to collaborate with an organisation or to pursue an opportunity in two main ways: academics could lead the decision making, or controversial proposals could be taken to the ethics committee and/or senior KEO management (the role of ethics committees is explored in Section 5.4.4, pp.157-159). In some KEOs, academics would decide whether or not to pursue an opportunity; this would be determined by their research and teaching strengths. It depended partly on which organisations approached academics. A company would approach an academic who would often considering raising their research profile and their KEO could have a different view.

> *"…. if there was an organisation that had a kind of controversial, whether it be political or ethical it would go to the senior management team. They would give their comments on it, and on the basis of that, we would make a decision."* (Interviewee No.12-KEO-Other)

> *"Generally speaking, my sense is this will be the same for all universities, is that's down to senior research leads and research leads, and on the teaching side as well, at the academic level to decide who they're partnering with …... But it's fundamentally driven by research and teaching strengths."* (Interviewee No.5–Pre-1992 university)

Where an academic's view differed from those of the corporate KEO, the knowledge exchange office had to mediate; the academic view usually prevailed, unless there was a risk of damage to the KEO's reputation or legal implications, when senior management would decide. In some instances, there would be a debate about whether or not to work with a tobacco company. If an organisation

was controversial, politically or ethically, the case would go to the KEO's senior management team to consider. If a company wanted the KEO to work on weapons for attack, soundings would be taken among senior KEO management. As a KEO had to ensure that it did not do anything ethically irresponsible, senior KEO management would make decisions. KEOs had refused to work with particular kinds of organisations or business sectors for ethical, political or reputation reasons. Interviewee No.4 gave an example:

> *".... there was an issue that came up because somebody was looking into something with arms, and it was a different, it was like Qatar or Dubai, was interested in the collaboration with... I think that there when we had our ethical debate and we decided that working with an Arab state was not something ...."* (Interviewee No.4–Pre-1992 university)

Another KEO had accepted funding from the British Bankers Association who had been instructed by the Treasury to fund some research initiatives and centres. This gave the banking profession an opportunity to retrieve or repair its reputation. Another KEO had decided to work with Nestlé, a company whose activities had been contentious in the past. Dilemmas raised by academics refusing to work with particular organisations or business sectors as an ethical issue are explored in Section 5.3.2 (pp.136-137).

This section has explored the approaches that KEOs take in deciding how to work with business, the approaches and strategies which they adopt. There are few studies on this and the implications of this gap are explored in Section 6.4.2 (pp.196-198). The next section explores how KEOs decide when and whether to work with "controversial" organisations and sectors.

4.5 Working with "controversial" sectors and organisations

This section explores examples of two potential contentious areas of collaboration in the tobacco and defence industries. These consider the ethical and moral boundaries of knowledge exchange by analysing how KEOs applied their policies and approaches in deciding when and how to collaborate with outside organisations and business.

4.5.1 Tobacco

Many KEOs had clear policies about collaborating with tobacco companies. Some KEOs had written policies that they would not work with tobacco and weaponry; another KEO had a clear policy that it could work with tobacco companies as funders or with direct tobacco manufacturers and related companies. Although a KEO had few criteria about whom it would not work with, these included direct tobacco manufacturer and related companies, and companies which developed warheads. KEOs could cite that tobacco caused harm to humans as a reason to refuse to work with a tobacco company. Another KEO would not want to work with a tobacco company as it would not feel that it would be socially responsible to do so. Some KEOs would find it difficult to work with tobacco companies, given their significant health activities; the health school was the largest school in the KEO.

> "…. *they would be a toxic company for the university in view of the fact that a third of the university is health related. So how could one academic in the school of health be contributing to something like that at the same time the university is being funded elsewhere from the tobacco industry.*" (Interviewee No.19–Post-1992 university)

The same KEO had refused to work with a tobacco company as it did not want to be branded as working with a company that killed people. Other KEOs would not work with a tobacco company as they did not want to create a public perception of being involved in unethical research, and wanted to minimise any potential organisational risk; working with a tobacco company could create a public perception of the KEO working on unethical issues; it was a reputational risk for a KEO. Some KEOs felt that research undertaken with a tobacco company would not be robust, that the funding source could constrain and compromise the research.

> "…. *if, for example, British American Tobacco was going to be designing the project, there may be some worry that the results may not be robust.*" (Interviewee No.7-PSRE)

Some KEOs had other constraints placed on them. Several KEOs had declined to work with tobacco companies for two reasons; on ethical grounds and for

financial reasons. Interviewee No.35 (PSRE) explained how when their KEO worked with the NHS, it was required to sign documents saying it would not work with tobacco companies. Cancer Research UK (CRUK), Wellcome Trust and British Heart Foundation put funding constraints on KEOs who worked with tobacco companies. When approached by a tobacco company, a KEO sought authority from CRUK and Wellcome Trust that it would not jeopardise anything by taking up the opportunity. On the other hand an interviewee stated that British American Tobacco allegedly claimed to provide funding to Cancer UK.

> *"Well, that's very clear because we have a very clear policy that we cannot work with tobacco companies. …..Because I think it was the Wellcome Trust or Cancer Research UK said "If you work with.. then you would not get any grants" so it was for that decision, because it comes back to the money doesn't it? CRUK said 'we're not going to give you money' then we're going to stop doing something that prejudices."* (Interviewee No.31-Pre-1992 university)

> *"Interestingly, we had a case just last week from Dunhill. And those sorts of queries when we get sight of them go up to PVC Research and if necessary he takes it to a subgroup of the university exec. And they wanted to fund a piece of research or piece of consultancy, and what we did there was to go to Wellcome Trust and to CRUK and make sure and get authority from them that we would not jeopardise anything by participating and, you know, taking this."* (Interviewee No.28–Pre-1992 university)

Some other KEOs had worked with tobacco companies and were happy to do so. Although there was no documented ethical policy, a KEO's senior management had reviewed an approach from a tobacco company and agreed that the KEO had no difficulties in collaborating with it. Another perspective was that tobacco was a legal product, so it was acceptable for KEOs to work with tobacco companies which were viable entities, selling their products legally. If a KEO refused to work with a tobacco company, BIS or central Government could object; a KEO's refusal could clash with BIS's objectives.

"There is.. as far as I'm aware there is no documented ethical policy, however there have been instances where organisations have approached us that.. I think we did actually get approached by BAT [British American Tobacco] *about doing some work on one of our facilities and I batted it up to….., and I batted it up to the very top and it came back that we had no problems with working with BAT."* (Interviewee No.33–PSRE)

"I don't necessarily have a problem with the tobacco industry because it's a legal pastime and, you know, if the government was serious, any government was serious about curtailing the negative aspects of tobacco then they should ban it." (Interviewee No.33–PSRE)

KEOs were in two minds about whether or not they would be happy to collaborate with a tobacco company; it could depend on what the tobacco company wanted the KEO to do, the end purpose or objective of the research: to promote or discourage smoking. If the tobacco company refused to permit the KEO to publish the results of the research, or if the research produced negative results and a tobacco company would not let the KEO publicise this, it would conflict with academic expectations. If a tobacco company was going to design a research project, there was concern that the results might not be robust, that the research might not be independent.

"And then when that came to an end, I had a tobacco company come and say, "Could you do the same kind of thing with tobacco smoke?" So I had a go, and I worked out that I could actually, count the, particulates being inhaled using a light scattering technique. ….. And at the time I said to them, "You know this is interesting but it also shows how dangerous smoking is and you really ought to think about it." And that was more or less when they terminated the contract." (Interviewee No.26–Pre-1992 university)

Some KEOs' ethics committees or senior management would have clear views about whether the KEO could work with a tobacco company; for example, a proposal from a tobacco company to collaborate on developing an electronic cigarette. Working with organisations which were sponsored by a tobacco company was contentious. There had been interesting discussions about tobacco sponsored companies and whether the KEO could work with them when

they had a health faculty. There were also debates about the appropriate degree of distance needed from a tobacco company before it was ethical to work with them, for example, with a subsidiary of a tobacco company. Other KEOs would prefer to work with a tobacco company in conjunction with another party to minimise the potential threat to their reputation.

> *"…. because we did have a strong engineering partner, with strong links to Formula 1, there was some really interesting issues around tobacco sponsored companies and whether we could work with them in one faculty, whereas obviously they were completely persona non grata in the health faculty. So, some interesting judgements as to what was appropriate, what degree of distance from the tobacco company did a subsidiary have to have before it was ethical, to work with."* (Interviewee No.5–Pre-1992 university)

4.5.2 Defence

KEOs were divided about whether KEOs should work for or collaborate with defence companies or the sector. Some KEOs undertook defence research and were happy to be open about it. Some KEOs had refused to work with defence companies outright as they felt that it was unethical. An example was given of how CERN, an intergovernmental organisation, had an ethical policy that its research was not to be used for military purposes. KEOs could be wary about being involved in defence as the line between defence and security was not always clear.

> *"As an organisation, we are wary about being involved in defence. However, where does the line between defence and security reside?"* (Interviewee No.33-PSRE)

A distinction was made between working on defence for attack or chemical weapons, and defence for defending the UK. Working with defence weaponry where equipment was being provided to defend the UK, would be acceptable. However, land mines could be an issue, such as those which lay dormant for 20 years. Another KEO would not collaborate on development for chemical warfare agents or work which countries that had a doubtful security record.

> *"I think the line might be things like land mines and so on, that there may be some subtleties in the debate, things that might lie dormant for 20 years and then explode, you know."* (Interviewee No.8-Pre-1992 university)

> *"…. where you wouldn't be developing chemical warfare agents or working with, with countries that clearly had a dubious record in terms of security and that sort of thing."* (Interviewee No.14–Post-1992 university)

It could be difficult to draw a line when some companies such as BAE and Boeing produced items such as aeroplanes that could be used for both military and consumer activities. On the other hand a KEO had worked with British Aerospace which made fighter aircraft that foreign powers could buy and use to kill people. Another KEO did not work for companies which developed warheads. However, the KEO did work for the military undertaking distributed computing for social scenarios, not for putting warheads on weapons. It was not clear whether a KEO could legitimately undertake work to help clean up something caused by defence contractor, particularly if it was a foreign defence contractor that had polluted its own land.

> *"Well, again that's interesting because regionally of course we have British Aerospace and we have worked with British Aerospace in the past ….. but actually they make fighter aircraft that actually can be bought by foreign powers to actually kill people, and so there has been some concern in some quarters about should we be working with BAE Systems?"* (Interviewee No.30–Pre-1992 university)

> *"So the best example is a programme grant that we have where BAE is a partner and BAE obviously has a military arm, but the work that we're doing with them is about distributed computing in disaster situations and how you maintain those communication channels and network nodes and that sort of thing, but it's in a disaster situation rather than a military battlefield."* (Interviewee No.28–Pre-1992 university)

Another KEO worked on unmanned aerial vehicles (UAVs) and there had been questioning of whether it should. Some academics were reluctant to or refused to work with defence companies or on defence contracts and were unhappy about their KEO becoming involved in developing on UAVs. Some people who worked for KEOs could have worked in defence laboratories but had chosen not

to. Interviewee No.26 recalled an episode on a BBC science programme which included an academic interested in robotics who became concerned that his research was being applied to "clean weapons". The academic had become involved in arguing against the weapons industry applying robotics research as he felt that robots could not make an ethical decision about releasing a weapon.

> *"…. on the BBC, it was the Life Scientific,…. with a psychologist who was really interested in robotics, became very concerned with his robotics research being put to so called 'clean weapons'. And the extent to which he got involved in trying to argue against the weapons industry applying robotics research, because he felt that robots could not make an ethical decision about releasing a weapon."* (Interviewee No.24–KEO-Other)

Table 4.9 summarises how KEOs approach working with sectors, such as tobacco and defence.

Tobacco	Defence
Many KEOs had clear policies on whether or not they could or would work with tobacco companies	Divided about whether the KEOs should work for or collaborate with defence companies or sectors
Tobacco was injurious to human health	Refused to work with defence companies or the defence sector outright as they felt that it was unethical
Reputational risk to KEO and academic if they created perception of being involved in unethical research	Distinction between working on defence for attack, and defence for defending the UK. The line between defence and security was not always clear
KEOs with healthcare and/or medical schools - sensitivities about how they engage with tobacco	Land mines which had lain dormant for 20 years, developing chemical warfare agents, countries with doubtful security issues and UAVs
Funding constraints - Cancer Research UK and Wellcome Trust will not fund research in KEO that work with tobacco companies. NHS has similar requirement	Condemned war, but understanding the need for research into the hard end of defence, and the consequences of war
Happy to work with tobacco as it is a legitimate business, a legitimate business	Difficult to draw the line when some companies such as BAE and Boeing produced products such as aeroplanes that could be used for both military and consumer activities
Some Government sponsors work with tobacco and so KEO has to comply	Did not work for companies which developed warheads but do work for the military undertaking distributed computing for social scenarios, not for put warheads on weapons
Depended on what tobacco company wanted to do - end purpose of research - promoting or discouraging smoking	Outputs of research and knowledge that KEOs created developed could be used anywhere for any purpose
If a tobacco company was going to design a research project, there was some concern that the results might not be robust, that the research may not be independent	KEO could be working with a commercial company that is selling to the MOD or Saudi armed forces
Would refer an approach from a tobacco company to KEO's ethics committee or senior management for approval. Would also check with CRUK and Wellcome Trust to ensure that research funding would not be jeopardised	

Table 4.9 Comparing KEOs' approaches to working with tobacco and defence sectors

Table 4.9 illustrates how KEOs varied in how they handled working with "controversial" business sectors. Some KEOs had clear, documented policies about whether or not they would work with tobacco companies. Other KEOs were constrained by their funders' grant conditions. Some KEOs' concerns about working with "controversial" business sectors were ethical issues or threatened to undermine their academic status or to conflict with their role or core mission. A common theme was that KEOs could agree to work for a company where the end use of the research was for legitimate ends: a different end purpose could make a difference. Some academics were happy to work in controversial areas as they felt that they wanted to make a professional contribution to important issues.

4.6 Conclusion

This chapter has reviewed knowledge exchange practitioners' views on how KEOs engage with the world, by exploring KEOs' role, the three dimensions of knowledge exchange, the relevance of stakeholder theory and management to KEOs, and how KEOs approach deciding with which organisations to collaborate.

KEOs were understood as having four main roles: as businesses, research, teaching and supporting their communities. Although KEOs were understood to be educational and research organisations, they were also seen as large research and education academic led businesses. Unease could arise as KEOs sought to exploit the results of their research as this could conflict with their charitable objectives. As well research and teaching, KEOs were an integral part of the community and significant contributors to the local economy. KEOs were a central public space and many KEOs opened their cultural and other facilities to the community. People vested a higher degree of trust in KEOs than other organisations; KEOs were seen as politically impartial independent arbiters. KEOs believed that working with local business was an integral part of their role. Although KEOs could be seen as elitist and remote from the rest of the community, widening participation and the growth in the number of KEOs were now changing perceptions. The public reaction to the LSE-Libya crisis in 2011 highlighted how the public expected KEOs to have higher ethical standards than other kinds of organisations.

Descriptions of knowledge exchange emphasised the two way process, interaction between KEOs, academics, and the outside world, as part of building relationships with external organisations. On the other hand, definitions of knowledge transfer tended to emphasise its episodic nature and focus on exploiting intellectual property, aiming to extract as much value as possible from a piece of research or knowledge.

A way of exploring the breadth of knowledge exchange was to consider the activities which it embraced. Knowledge exchange activities could be understood as a continuum ranging, from public and community engagement to setting up spinout companies, from knowledge exchange to technology transfer. Taking this one step further, knowledge exchange and technology transfer activities could be mapped against the degree of "softness" or "hardness" of the intellectual property which was being applied.

Traditionally, knowledge exchange was seen as a part of a linear process that followed on from research, particularly in STEM. For social scientists, knowledge exchange was part of the research process, providing a feedback loop when outputs from research were fed back into the research. In this way knowledge exchange could be seen as a social process, from which research users could benefit. This could involve adapting particular research outputs to meet particular needs. Knowledge exchange can be seen as a process of deciding the value of a piece of research or knowledge, and when the outside world could use it.

When exploring the rationale or drivers of for knowledge exchange, three themes emerged from the data: Government policy to encourage KEOs to contribute to economic growth, income generation, and co-creating knowledge. The Government saw KEOs as a resource to use to support the economy. Knowledge exchange was also a source of potential income to replace cuts in public funding. Co-creating knowledge with external organisations was a third reason for KEOs to undertake knowledge exchange. Getting recognition, getting their research used in some way and finding partners for future research motivated academics; knowledge exchange was seen as a way to achieve these.

The coming of impact was reinforcing this. "Impact" could be defined in different ways, such as making a difference, or getting the results of research used in

some way. The impact of research in STEM was more tangible, whereas the impact of research in social sciences might not be linked directly to the research. Impact could also be understood as a way of demonstrating the return on public investment in research and showing how the research that KEOs undertake could benefit economic and societal development. Knowledge exchange was seen as means of translating research for others to use; impact was the output or way of interpreting an outcome; it was longer term.

The concept of "stakeholder management" did not seem to exist within KEOs; it tended to be undertaken informally on an ad hoc basis. Although it could seem that leading KEOs had increasingly realised the importance of stakeholders the research findings indicated that this might be exceptional. From one perspective, KEO and knowledge exchange shareholders were the same as knowledge exchange was central to a KEO's mission. On the other hand, KEO and knowledge exchange stakeholders overlapped, with different weights given to particular kinds of stakeholders. In some instances, knowledge exchange stakeholders were seen as a subset of a KEO's stakeholders.

KEOs had a range of approaches and policies in how they collaborated with other organisations and companies, particularly "controversial" business sectors, such as tobacco or defence companies. The research findings indicated that there was some overlap between the strategies and approaches that KEO used in determining which organisations to work with and the criteria KEOs used to help them make decisions about with whom to collaborate. Taking a case by case approach was more common than developing and applying a coherent strategy. However, there was a trend among some KEOs to developing a more strategic approach, to consider where they could best invest their knowledge exchange resources. Some KEOs had clear, documented policies; other KEOs were constrained by their funders' grant conditions. Some KEOs' concerns about working with "controversial" business sectors were ethical issues or seen as threats to their academic status or conflicts with their role or core mission. A common theme was that KEOs could agree to work for a company where the end use of the research was for legitimate ends: a different end purpose could make a difference.

This chapter has considered how knowledge exchange practitioners perceive how KEOs engage with the external world. The next chapter, Chapter 5, turns inwards to explore the research findings on the ethos of KEOs and knowledge exchange.

Chapter 5:   Ethos of knowledge exchange: Research Findings II

5.1 Introduction

After considering what the research findings revealed about how KEOs engage with the world (Chapter 4), this chapter turns to explore what the data reveal about the ethos of KEOs and knowledge exchange, and knowledge exchange practitioners' views on this. This includes the relevance of CSR, how it is practised in KEOs, the significance and application of academic and knowledge exchange values, the provision of guidance on knowledge exchange issues, and how checks and balances are used to manage ethical issues that can arise in knowledge exchange. The discussion then looks at ethical boundaries and ethical issues, some of which recur as underlying themes in other parts of the research findings.

5.2 Corporate Social Responsibility

This section explores aspects of CSR as illustrated in Figure 5.1. An interviewee gave a broad definition of CSR.

> *"I think universities do have that social responsibility, which spans from providing a good education … it is about educating our teenagers and 20 year olds, for life, and in a way that allows them to change direction throughout their lives. So it's from that point then, we need discoveries, we need development and new technologies to drive forward, otherwise we become a third world banana state, but that's about driving wealth of the nation. But then there is a piece about universities behaving responsibly within the communities in which they sit. So, that's everything from how our students behave, not smashing up neighbours' houses and gardens and things, through to not appearing to behave in a cavalier manner"* (Interviewee No.28–Pre-1992 university)

This definition is reflected in Figure 5.1.
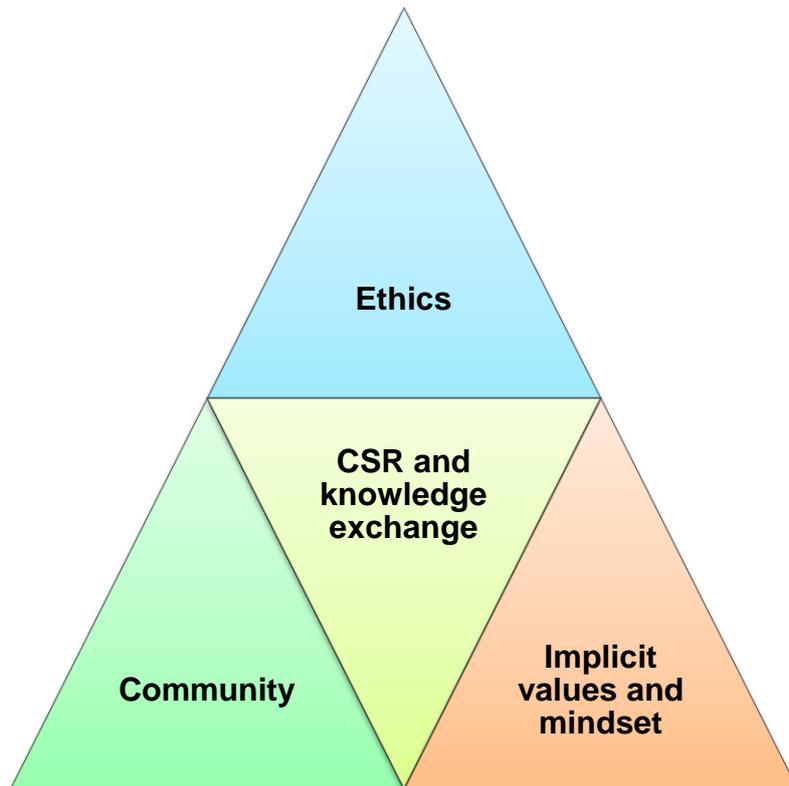
Figure 5.1 Aspects of CSR in knowledge exchange

Parts of this definition could stand as a definition of knowledge exchange. CSR was perceived as mutual, reciprocal and, for knowledge exchange practitioners, CSR and ethics were interchangeable. The ethical dimension of CSR had several components: doing good, values, public good and broader social responsibilities that were linked closely to KEOs' broader role and mission. Although KEOs took CSR seriously, it was hard for them to call what they were doing CSR. Working with business could be seen as part of knowledge exchange and CSR; engaging with business could be approached as trying to turn them good from the inside out.

> *"So, I do believe working with big corporates, not necessarily good ethical corporates, to try to turn them good from the inside out. So we were working with a gambling consortia who wanted to try to figure out better ways of managing the way they work so they don't get people who are more prone to addiction, for instance."* (Interviewee No.4-Pre-1992 university)

The concept of the role of KEOs as a public good was implied rather than known or expressed openly. KEOs were arbiters of truth and knowledge and had a

social responsibility to maintain this. A KEO would be expected to uphold firm views about CSR as KEOs believed that they had a responsibility to change the world. Sometimes research into difficult areas was required, even though it did not seem ethically responsible. KEOs had significant moral and social responsibility to the community, inspiring children and demonstrating their inherent added value by showing taxpayers what their funding was being used for and for whose benefit. CSR as ethics was described as being about academic values (which are discussed in Section 5.3.1), the effect of being seen to do the right thing, and fairness across the board. CSR was a conscious route to making sense of things and helping people to see there were other things outside themselves. It involved forms of engagement with people in the outside world with whom a KEO could engage and converse, while sustaining its own value system.

The second dimension of CSR in KEOs was KEOs' involvement in the community and this was interlinked with KEOs' roles having a community focus (which is explored in Section 4.2.1, pp.69-71). The community dimension involved KEOs being a good neighbour, an organisation with which others were happy to interact, as they knew KEOs had consistent and transparent values. It also meant the KEO understanding its influence on the local community, and addressing any negative impacts, such as remedying any environmental damage. As KEOs were often large employers, a KEO had to be sensitive to potential environmental issues that could arise from staff travelling to work and contribute to the local transport infrastructure. A KEO had a responsibility to local residents about the student population; working with partners to ensure they were looked after and stayed in the city. It included getting involved in the economic community for the benefit of the city. A KEO's contribution to its community through CSR reflected its willingness to undertake socially responsible activities.

> *"CSR is about the university being a good neighbour - being an organisation you are happy to deal with, knowing it has consistent and transparent values."* (Interviewee No.1-Post-1992 university)

> *"…. what is it, the third largest employer in the region, and as such that comes with significant responsibilities about infrastructure."* (Interviewee No.28–Pre-1992 university)

> *"So, it has a responsibility, the university's bringing lots of students in, so we're bringing 20,000 students into the city. It's got a responsibility to work with the partners to make, ensure that they are looked after. And people… and also, that they can link with other partners to try and keep them in the city."* (Interviewee No15–Post-1992 university)

The third significant theme that emerged from the findings was that CSR was inherent or implicit in what KEOs did, part of their mission and values. Social responsibility was inherent in the role of KEOs, fundamental to what they did. CSR was seen as diffuse; KEOs often did not have a separate policy or programme for it. Social responsibility was an inherent part of KEOs and academics, part of their motivation.

> *"I can't argue why because it seems to me that it is fundamental to the core activities."* (Interviewee No.6–Pre-1992 university)

> *"I think the public good idea is implicit, implied rather than kind of known. I mean … people do think it's there for the public good. People have come from industry to work there, not because of the salary sadly. So there is that feeling of… but still it's not shouted about, it's not stated, so it's very under the covers as it were."* (Interviewee No.25–Post-1992 university)

CSR was implicit among academics, inherent in the kind of subjects researchers were exploring; their research topics reflected their beliefs and happened automatically as part of the research process. Although there was not an idea in KEOs that they had to do good for society, academics were inherently aware of their social responsibility due to what they were researching; CSR was ingrained in academics. An interviewee expressed this more clearly:

"And in terms of what we do in terms of social responsibility ….. because I always see that I work at a university which has, I'm sure it's explicit somewhere, but very much for me, an implicit social responsibility to our students, to our staff, to our community, to the people that we work with. So I think that's a given in terms of what we do. I don't think there's anything that we do that is specifically designed to be socially responsible, but what we do is meant to be that, yes." (Interviewee No.11–Post-1992 university)

These three aspects (ethics, community and inherent) link CSR in KEOs with knowledge exchange: KEOs exploiting knowledge and technology for social good, undertaking socially responsible knowledge exchange activities. This element of CSR in knowledge exchange involved ensuring that KEOs' knowledge was used to the best intentions and best advantages. It included KEOs finding homes for their technologies and helping to create new products and income for its region, or for its country. It also meant that KEOs used their knowledge to answer social questions and transferred the knowledge to partners.

"…. corporate responsibility is really around making sure the knowledge that you have is used to the best intentions and best advantages to people." (Interviewee No.2–Post-1992 university)

"I think we do, we have a responsibility to find homes for our technologies and I would see that as a social responsibility to help create new products and income for our region, or for our country, so yeah definitely I would say we do have social responsibility in that respect." (Interviewee No.35-PSRE)

"But the social side is, I think, there are social questions that need to be answered, and using your knowledge to do that is a good thing." (Interviewee No.15–Post-1992 university)

Some KEOs were willing to support activities that did not bring them any financial return or to undertake projects that offered broader societal benefit. For example, Interviewee No.15 (Post-1992 university) described how the knowledge exchange office was running a scheme where the KEO received a small amount of money to help local business develop business plans. So, instead of using the KEO's research base, the knowledge exchange office was using its expertise for

the city's benefit. Another example was KEOs working with SMEs even when it was not profitable for it to do so. KEOs' willingness to forego financial return in some knowledge exchange activities and projects illustrated the significance of the KEO's position in and relationships with its local community.

On the other hand, KEOs sometimes found that getting involved in the local community, particularly the local business community, needed a proactive approach, particularly where a KEO was located outside or on the edge of their town or city. Some KEOs sought the kind of projects which would not be ones that would give maximum monetary return to the KEO, but would have the best benefits for the population. This created tension between undertaking the good research that needed to be done to ensure it was done correctly against the pressure to try to do it quickly to maximise the return. If a KEO was driven solely by creating revenue, it would ignore some of the social aspect of its role; it would not be concerned if its intellectual property was less widely available. But the downside was that the uptake of the intellectual property in the market could be lower and this might not be the best thing in terms of social responsibility.

> *"The other side of it of course, if I go and talk to the business side, they can see that this is a massive market and 'let's go for it and let's do this and let's do that' and it's really tensioning the good science that needs to be done to make sure you get it right, against the pressure to try and do it quickly to maximise the return."* (Interviewee No.32–PSRE)

> *"If you take KE* [knowledge exchange] *in its broadest sense, if you're driven entirely by profit and creating revenue, then you will ignore some of the social aspects, and wouldn't be concerned if IP* [Intellectual Property] *was less widely available than it would otherwise be, because you're creating potentially higher royalties. But the uptake in the market may be lower, and in a sense of social responsibility that may not be the best thing."* (Interviewee No.5–Pre-1992 university)

Although CSR was understood to be associated with sustainability and environmental issues, it had a wider meaning for knowledge exchange practitioners and in KEOs. The research findings tended to reflect KEOs' roles rather than differentiate between kinds or domains of social responsibilities as

displayed in Carroll's CSR pyramid (Carroll 1979; Carroll 1991) and Lantos's extension of this (Lantos 2002), which were explored in the Literature Review in Section 2.4.3 (pp.31-32). The data reflected much more of Esfijani et al's approach to CSR (Esfijani et al. 2013), and the implications and further development of this are explored in Sections 7.2.2 and 7.2.3 (pp.202-205). CSR was inextricably linked with other facets of KEOs' role and mission, and academic ethos; it formed part of the ethical climate of KEOs. These issues are explored in the next section.

5.3 Knowledge exchange ethos

In this section, four dimensions of academic ethos are explored: academic values, applying academic values, KEO values and knowledge exchange guidance or reference points. This section also explores how academic values and ethos are applied and the kind of steps that KEOs take to ensure probity and integrity in knowledge exchange.

5.3.1 Academic values

The concepts of academic ethos and values were still valid, even though their significance varied across disciplines. Academic freedom was a strong moral value for academics and it was an integral element of academic ethos in three ways; an academic being able to choose what research to undertake and how, deciding with whom to collaborate, and having the ability to use knowledge they gained elsewhere in their research. Interviewee No.8 (Post-1992 university) described how one of their Vice-Chancellors went to prison to defend academic freedom, when the art faculty had a book which the police viewed as pornographic.

Independence of academic thought was a fundamental driver; an academic's independence was paramount. The integrity of objective research was about the values of scientific inquiry, whether it was in STEM, social sciences or humanities. An academic's value was based on their creating new knowledge; without them business would not receive the benefit from KEOs that it did. Without academics, the creation of knowledge would be driven on assessments of return on investment. Many academics held that there was something

inherently right and truthful about being curiosity driven, about challenging accepted ways as that was what academics should do. There were values that framed the view an academic took, which were linked closely to the idea that academics were at least notionally independent; they tried to ensure that their disciplines advanced by means of systematic analysis, evidence and reflection.

> *"…. which is about the integrity of the objective research. It's about the values of all scientific inquiry, whether it's social scientific or actually even humanities inquiry. Which is that it is genuinely led by an attempt to refine a hypothesis, not prove an outcome."* (Interviewee No.1–Post-1992 university)

> *"…. there is something inherently right and truthful about being curiosity driven, about challenging accepted ways, because that's what you should do."* (Interviewee No.26–Pre-1992 university)

Academic freedom meant freedom for academics to decide what research to do, not about the freedom to do poor research. Academics could not be told what decision to make about their research or what result they were going to find; academics wanted to take a truthful position. Academic freedom meant giving academics space to voice their opinions, to express their concerns if something was compromising them as an individual researcher. It was about examining something, benchmarking, forming a balanced view based on the evidence. Organisations who wanted to work with KEOs had to accept this. KEOs would choose the best academic to undertake research, not necessarily the academic whom the stakeholder would have preferred.

> *"It is about examining something, benchmarking, using evidence base and if it comes up with particular conclusions, it needs to be untroubled by expectations of the study."* (Interviewee No.18-Pre-1992 university)

> *"Because it has to be independent. … We would say to them, you know, quality, impact, independence. Any stakeholder, you must for us… sign up to them first. And the implication of that is that we may choose the best quality academic to do work, not necessarily your friend."* (Interviewee No.7–PSRE)

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Academics had to be open and truthful, had to give an independent view. If they did not, they would lose their status, their promotion, their networks, and their research outputs as no one would want to use them. Unless an academic tried to establish the truth, their credibility, their reputation suffered. For example, social scientists would tease out the implications of a policy and then policy makers were responsible for making decisions about it, not the researchers. It was about examining the available evidence, and if the research came up with particular conclusions, these needed to be untroubled by the expectations of the study. It was vital for an academic to have a high degree of independence to have credibility.

> *"The independence of academic thought is a fundamental driver that you cannot be told what decision or what result you're going to come to."* (Interviewee No.5–Pre-1992 university)

Applied research was steered and led by research users' needs. However, this included the possibility that an academic could find out something which their collaborator did not like or changed the direction of the research. Academics could not write what customer wanted to hear; it was up to the client to decide whether and how they wanted to use the research. If an academic was paid to undertake some research and the outcomes of the research differed from those which the funder had expected, the funder needed to be aware that this could happen. If funding was going to constrain and compromise a research project, the research would not be independent. Most academics would take an objective standpoint and would not be influenced by the fact that a company was paying for the work. Interviewee No.26 gave an example of a company who did not like the results of the research they had commissioned and refused to pay the KEO for the work.

> *"... it was in fact the Director ... introduced me to this bloke from Marks and Spencer. And they were having trouble with huge numbers of returns of their clothing, because they were wrapping the clothing in cellophane and they were not using lighting in the stores which showed off the stuff in its correct colour. So I sat down and I said, "It's impossible, because of the reflectivity of the light from the cellophane. You're never ever, whatever you do with the ambient light, you're never going to get the true picture. You've just got to take this stuff out of the cellophane." .... Anyway, I wrote a twelve pager on this and sent it off with my invoice. I never got paid."* (Interviewee No.26–Pre-1992 university)

Just as importantly, academics and KEOs had to be transparent about where their funding came from and how they spent it. Companies engaged with academics for the unbiased, objective view they took.

> *"Because unless you try to establish the truth, and I'm being overly philosophical here, then your credibility, your reputation suffers."* (Interviewee No.20–Post-1992 university)

There were concerns in higher education that academic standards were threatened as KEOs looked to increase their external income and relationships, creating tensions between the academic or science logic of KEOs and the new market-driven logic. Concerns about the potential loss of academic freedom were real as academics were under severe pressure to publish, generate knowledge and ideas, and engage more with outside world. So it could be tempting for academics to lower their standards. Although academics might not change their core values, the introduction of impact meant that, academics were tending to soften their anti-commercialisation principles, aligning their values with the funding stream. Engaging more closely with business could make it harder to uphold academic values. An academic could not be disinterested if they had a relationship with a company and were working with them; ultimately, the academic wanted the company to be successful and provide more research funding.

Stronger academics were willing to engage with knowledge exchange and impact, and used their judgement to strike the right balance between knowledge exchange and research. Academics could be influenced by market

developments, or social or economic needs, and still undertake their research within a framework of academic freedom. It was not in academics' interest to put their reputations and integrity at risk. KEOs needed to have the same ethical sort of quality and standards as they held in their research and teaching. KEOs signed up to certain behaviours and ways of thinking which applied to whatever they did. KEOs could not have a different level of ethical stance for their business or enterprise relationships. Knowledge exchange was driven by people with an academic mindset and mentality. A KEO had to always bear in mind what it stood for, what it represented and the potential effects of straying too far from that.

> *"But also there's an issue of our image as well of the university. So as much as I think that there would be ethical reasons to not work with them, at the same time, people would also be thinking of well, what will other people think if we work with them? So, I think that part of it is ethical and part of it is something about image, perception."* (Interviewee No.11- Post-1992 university)

KEOs liked to believe that they were seen as principled organisations which had values around transparency, openness and inclusion. Most people worked for KEOs because they valued something about the place; it was an important driver for many people working there, and so something that they wanted to preserve. Those who worked in KEOs were not doing it for the money; they were doing it because they believed in what they did. Autonomy and independence were important for academics and went with being able to follow their own moral compass. Many people who worked in KEOs were very independent. The prevalence of academic freedom in KEOs led academics to feel that they could express their ethical concerns and were able to follow them. Autonomy went hand in hand with wanting genuinely to make the world a better place. Academics had a core belief in what was right and wrong, in having some integrity; they believed in the integrity of objective research, the values of scientific inquiry. There was something implicit in the KEO that meant that academics behaved in a moral, ethical way. KEOs' apparently higher ethical standards stemmed from another cause.

"So, for instance, the kind of people that go into universities and research, you're not highly paid, you're doing it because you're good at it, because you love your work, because you believe in what you do." (Interviewee No.4-Pre-1992 university)

Some academic values were rated more highly than others. Table 5.1 summarises the results of the analysis of academic values by type of KEO in percentage terms.

	All KEOs	All universities	Pre-1992 universities	Post-1992 universities	PSREs	KEO-Other
Public Accountability	12%	11%	12%	9%	17%	15%
Integrity	29%	32%	27%	37%	17%	15%
Credibility	5%	7%	12%	2%	0%	0%
Trust	5%	5%	0%	9%	0%	8%
Reputation	27%	28%	31%	26%	17%	31%
Independence	17%	12%	8%	17%	41%	31%
Transparency	5%	5%	10%	0%	8%	0%

Table 5.1 Comparison of academic values by type of KEO in percentage terms

Across KEOs as a whole, integrity (29%) emerged as the most significant academic value, followed by reputation (27%), independence (17%), public accountability (12%), with credibility, transparency and trust ranked equally (5%). Figure 5.2 highlights these across all KEOs.
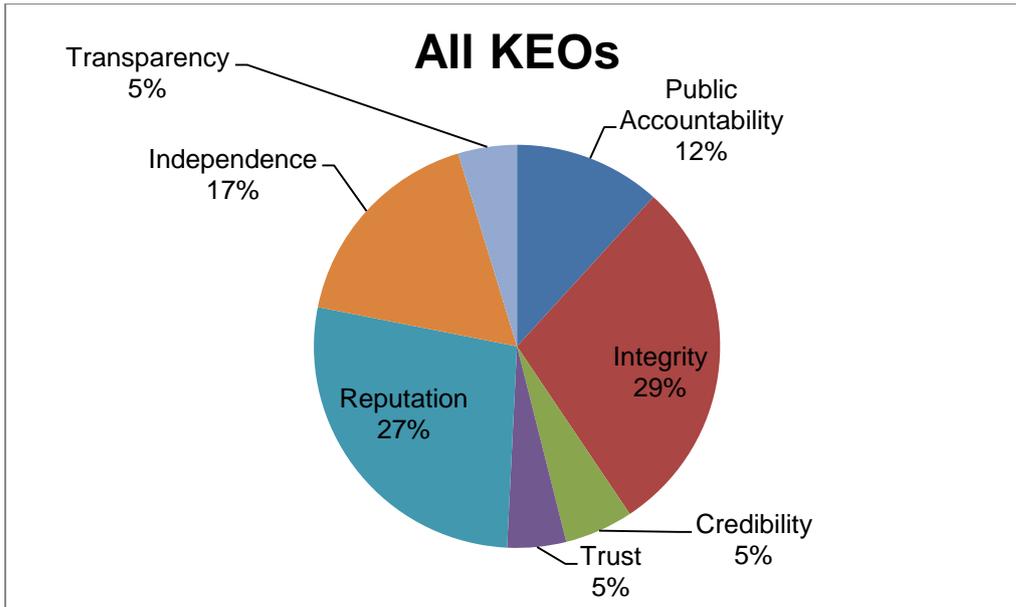
Figure 5.2 Knowledge exchange - values – All KEOs

When the responses from knowledge exchange practitioners based in universities are compared, Table 5.1 shows that for all universities, integrity was the most highly rated value (32%), followed by reputation (28%), independence (12%), public accountability (11%), credibility (7%), with trust and transparency ranked equally (5%). The results are shown in Figure 5.3.
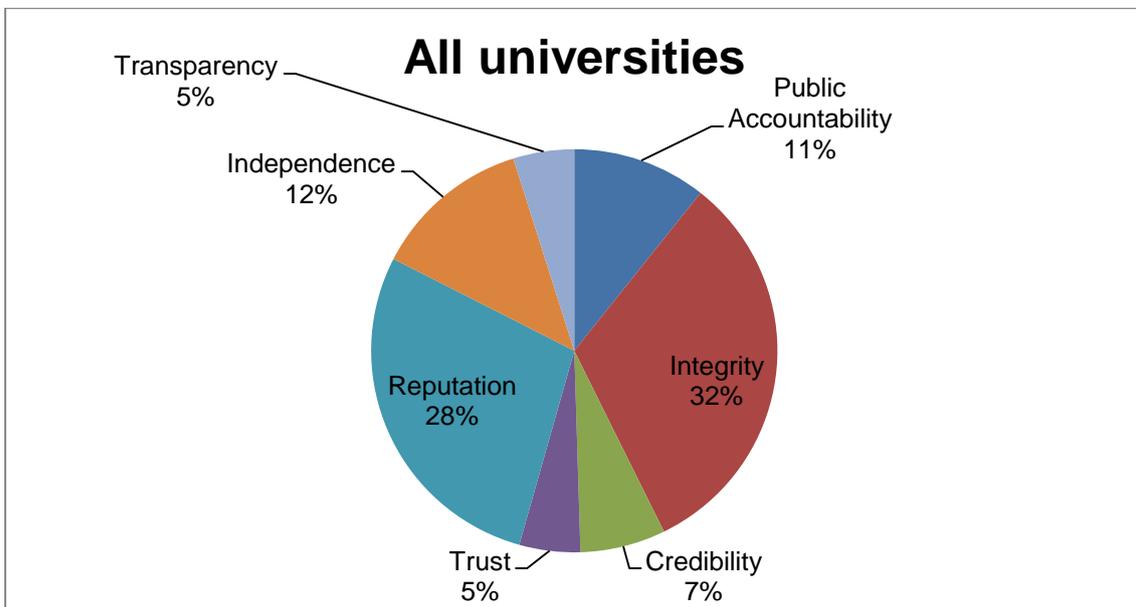
Figure 5.3 Knowledge exchange - values – universities

Knowledge exchange practitioners in pre-1992 universities and post-1992 universities disagreed on the significance of particular academic values. For knowledge exchange practitioners based in pre-1992 universities, Table 5.1 shows that reputation was the most important academic value (31%) with integrity ranked second (27%), followed by credibility and public accountability ranked equally (12%), then transparency (10%) and independence (8%); trust was not rated at all. Figure 5.4 summarises this.
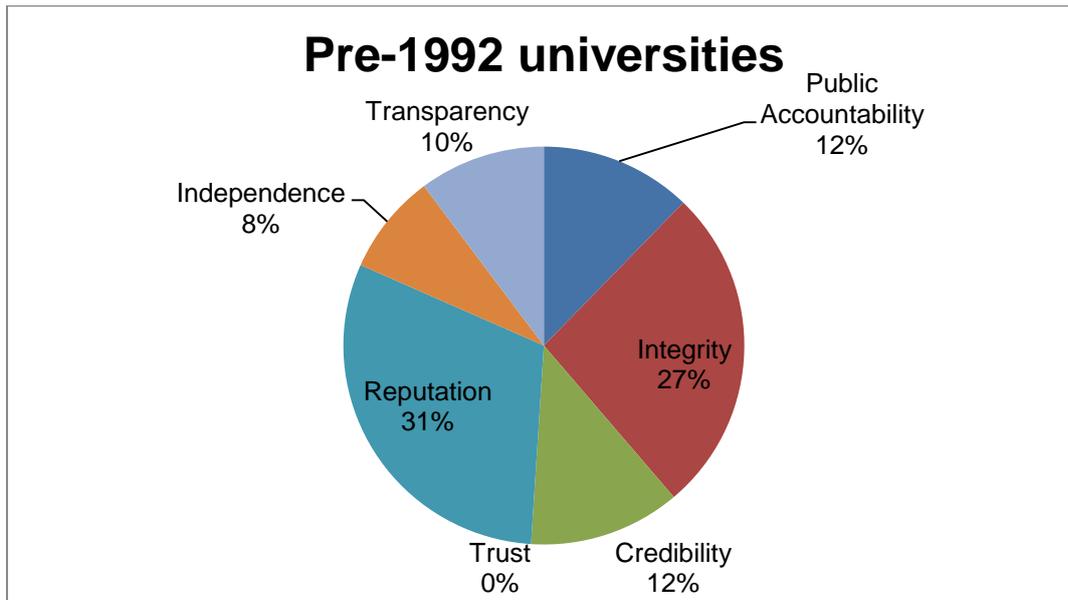
Figure 5.4 Knowledge exchange - values – Pre-1992 universities.

For knowledge exchange practitioners in post-1992 universities, Table 5.1 demonstrates integrity was the most significant academic value (37%), followed by reputation (26%), with independence (17%), and then public accountability and trust (9%). Transparency was the least significant academic value (0%), preceded closely by credibility (2%). Figure 5.5 illustrates this.
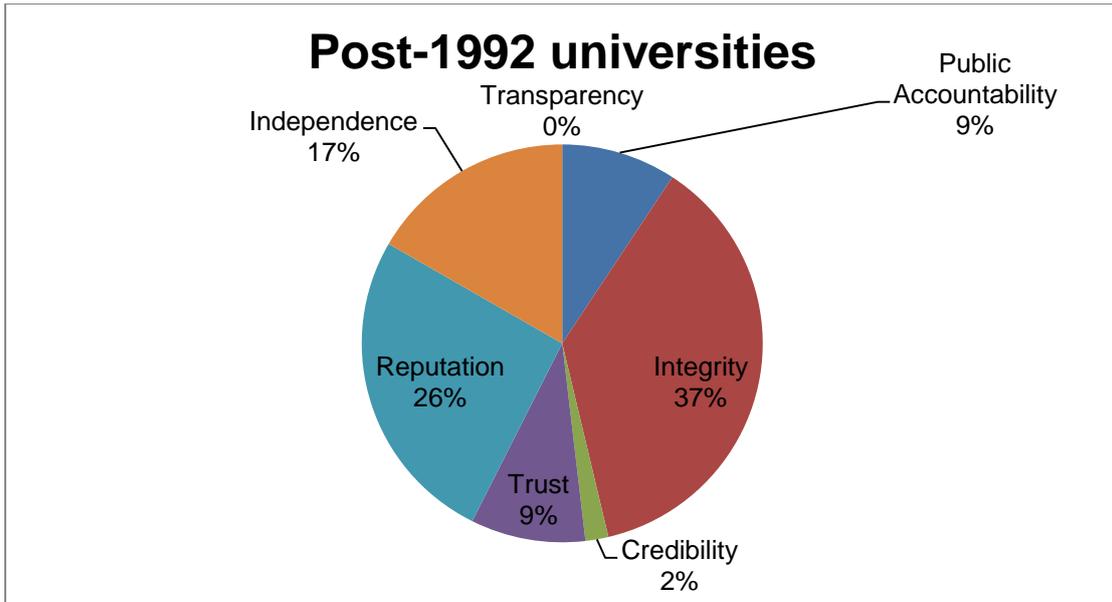
Figure 5.5 Knowledge exchange - values – Post-1992 universities.

Table 5.1 shows how independence (41%) was the most highly rated academic value for PSREs, with public accountability, integrity and reputation ranked equally (17%). Transparency was ranked next to last (8%); credibility and trust were not rated at all. Figure 5.6 summarises this.
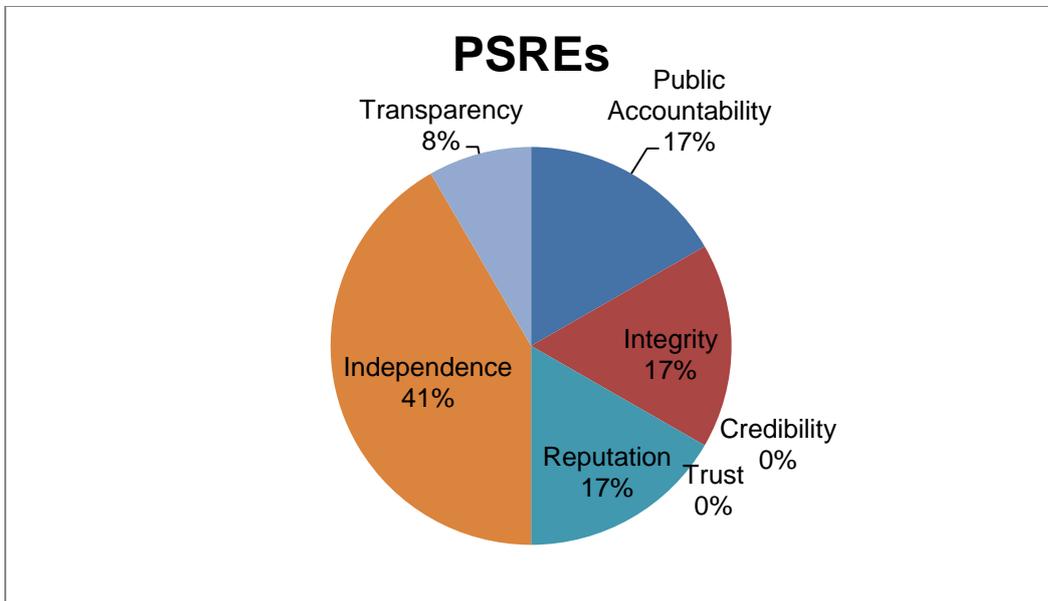
Figure 5.6 Knowledge exchange - values – PSREs

Table 5.1 shows that for KEO-Other, reputation and independence (31%) were the most highly rated values, followed by integrity and public accountability (both

15%), followed by trust (8%), while credibility and transparency were not rated, as Figure 5.7 shows.
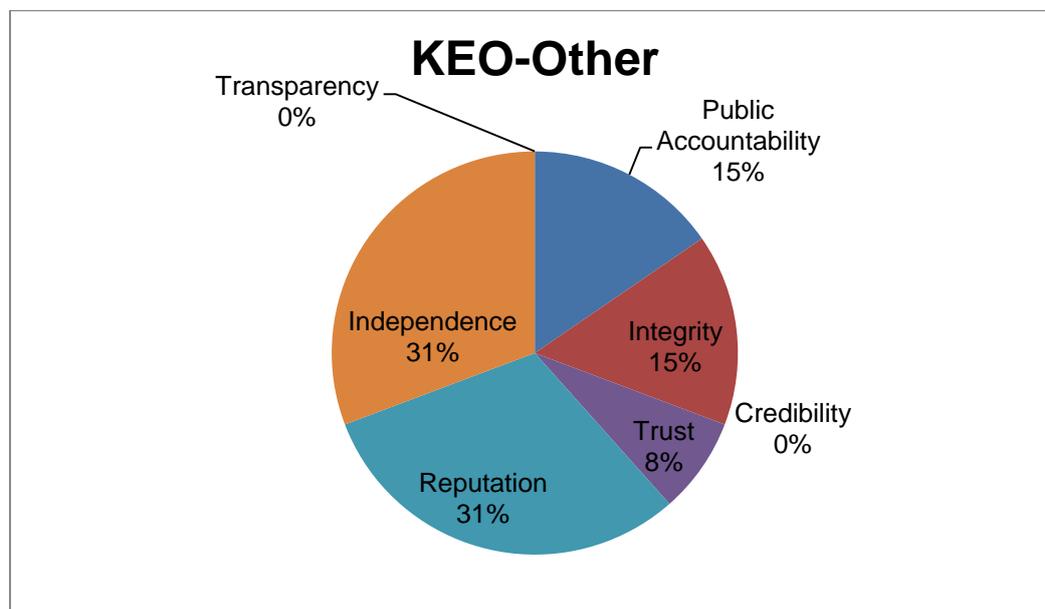
Figure 5.7 Knowledge exchange - values – KEO-Other

Table 5.1 shows how different academic values had varying significance for knowledge exchange practitioners in different kinds of KEOs. Integrity was the most highly rated academic value for knowledge exchange practitioners across all KEOs, particularly across all universities, and in post-1992 universities. It was the second most significant value for knowledge exchange practitioners in pre-1992 universities and was less important for PSREs and KEO-Other. Reputation was the second most significant value for knowledge exchange practitioners across all KEOs, all universities, the most highly rated by knowledge exchange practitioners at pre-1992 universities and post-1992 universities, PSREs and KEO-Other. Independence was the third most significant academic value for knowledge exchange practitioners across all KEOs, across all universities and in post-1992 universities. Independence was considered less important than transparency for knowledge exchange practitioners in pre-1992 universities. Independence was the most significant academic value for knowledge exchange practitioners in PSREs and KEO-Other.

Knowledge exchange practitioners did not feel that public accountability was the most highly rated academic value. It was most significant for PSREs (17%) followed by KEO-Other, and pre-1992 universities. According to Table 5.1,

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credibility was one of the least significant academic values for knowledge exchange practitioners across all KEOs, all universities, in post-1992 universities, and for PSREs and KEO-Other. Credibility was more highly rated for knowledge exchange practitioners in post-1992 universities. Trust was not considered as a significant academic value by any kind of KEO. Knowledge exchange practitioners in post-1992 universities and KEO-Other felt that trust was more important than transparency. Transparency was not seen to be a significant academic value. Knowledge exchange practitioners in pre-1992 universities rated transparency most highly and knowledge exchange practitioners in post-1992 universities and KEO-Other did not rate it at all.

For knowledge exchange practitioners across all KEOs and in universities as a whole, integrity and reputation were the most important academic values. However, across all universities, there was a wider gap between integrity and reputation, whereas knowledge exchange practitioners across all KEOs ranked integrity and reputation more closely together. Knowledge exchange practitioners across all KEO considered transparency to be the least significant academic value; this was reflected across all universities.

Table 5.1 shows that knowledge exchange practitioners in universities and PSREs had different views about academic values. Integrity was the most significant value in universities whereas knowledge exchange practitioners in PSREs felt that independence was the most important academic value. Credibility and trust were the least most important academic values for PSREs and transparency was considered to be more important than these. Knowledge exchange practitioners in universities valued trust and transparency least.

The persistence, to some extent, of Mertonian values reflects some studies in literature. Anderson et al (2010)'s research in the US in 2002 shows the persistence and validity of Mertonian norms (Anderson et al. 2010). Although the research findings endorsed Mertonian norms to some extent, the data showed a move away from them and increasing acceptance of other values. Lam's (2010) research highlights the continuing validity of Mertonian norms for academics, whilst they also learn to adapt to new values that enable them to participate in knowledge exchange (Lam 2010).

These issues are discussed in Sections 7.3.1 and 7.3.2 (pp.205-210). The next section explores how academic values are applied in a range of situations.

5.3.2 Applying academic values

Implementing academic values were explored through five scenarios: an academic refusing to work with an organisation, a company wanting perpetual confidentiality, a company wanting an embargo on publication, a company wanting to influence the research results, and a company wanting an endorsement.

If an academic refused to work with an organisation, KEOs would respect this, but would manage it in different ways. There were two reasons for doing so: academic freedom and independence, and keeping an academic happy and motivated. Some KEOs had reservations and would want to be assured that an academic had genuine or moral reasons for their decision. Some academics who had declined to work with an organisation had been heavily criticised and put under pressure to change their mind. An academic could damage their future prospects if they refused to work with an organisation. Some academics had refused to work with defence companies; other academics had refused to work with a major oil company on biofuels as they felt the company was taking food away from starving people. Although an academic could decline to work on a particular project or with a particular organisation, defence companies might eventually use the knowledge which that they created. The reality was that the knowledge academics created and developed was going to be used in all kinds of applications and sectors, including defence, even though an academic might not want their research to be used there.

> *"…. ultimately, we'd certainly respect that view if it was genuinely held."* (Interviewee No.16–Post-1992 university)

> *"I've met a couple of academics who refused point blank to work on certain things and they got an enormous amount of stick for it. They went "no, I'm not doing it". And it was around arms. And I thought you're right, and one of them was doing something … He just didn't want to work for them. He … was doing something on water reclamation, and he just didn't want it to be used for the way he thought it*

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would be used. And he was adamant. But the pressure to
conform and get that research grant was huge."
(Interviewee No.2–Post-1992 university)

The second scenario was where a potential collaborator wanted the KEO to sign a confidentiality or non-disclosure agreement that did not include any time limit; i.e. information which the parties shared would have to be kept confidential indefinitely. A commitment to perpetual confidentiality could restrict or curtail an academic's ability to publish; KEOs were assessed on the numbers of publications they produced. Some KEOs would agree to the request unconditionally; others would look to agree a specified time limit or until the information was no longer secret. KEOs accepted as normal the assumption of respecting and maintaining the confidentiality of information which was designated as "commercial in confidence". However, in some cases, this could act as a constraint; sometimes an academic could not publish. KEOs were becoming more aware of the value of their research and the need to generate research publications; they would look for some degree of flexibility in the arrangements which they agreed with organisations. One KEO expressed concern about the lack of a wholly watertight professionalism about respecting confidentiality of information that was given.

> *"Yes, I would do that* [sign up to perpetual confidentiality]*.*
> *If I've signed to do that I would. I wouldn't sign to do it if I*
> *wasn't sure what I was going to find."* (Interviewee No.36–
> Post-1992 university)

> *"Certainly, the general approach that I've been familiar*
> *with at the institutions I've worked at, is those requests*
> *will be considered and where regarded reasonable, can be*
> *accepted. So a restriction on publication to protect an IP*
> *position, some constraints on IP* [Intellectual Property]
> *assessment and when things can be protected and the*
> *sponsor having some involvement in that process… even as*
> *far as embargoing the publication of PhD theses for some*
> *period of time, would all be acceptable or in the right*
> *circumstances where there's clearly a commercial*
> *imperative, as opposed to any other imperative."*
> (Interviewee No.5–Pre-1992 university)

> *"… mainly on the grounds that forever and a day is impossible to enforce, as far as I can see. We are quite flexible in terms of the contracts which we do, which would have a time limit on that, one, two, five, ten years or whatever's reasonable. We have a reasonableness test, but, forever and a day is not, one of them."* (Interviewee No.19–Post-1992 university)

A common theme in KEOs' approaches to handling requests for a veto on academic publication was that this was an area to be negotiated at the start of a collaboration or project. One KEO was not concerned about agreeing to a veto on academic publication as they preferred the company to exploit the intellectual property. For other KEOs, freedom to publish was a top priority. Most KEOs tended to recognise commercial realities, particularly where an external organisation's confidential information was involved. KEOs would allow a company time to review the results of the research to determine whether they wanted to file a patent on it or otherwise protect it. Most KEOs were reluctant to agree to more than three months, with six to twelve months being commonly cited. One KEO was willing to go further and agree a veto period of between two to four years.

> *"…. normally we agree to two to four years."* (Interviewee No.35–PSRE)

> *"We wouldn't have a problem with that. In fact, it's quite refreshing, the attitude this university has around engagement with business, because there's very much the customer comes first. We're not so hung up on IP* [Intellectual Property] *protection, although we do protect quite a lot of IP. We'd rather it be exploited to the benefit of a company."* (Interviewee No.14–Post-1992 university)

> *"We will go as far as removal of confidential information as you would anyway and sometimes we've agreed, which is where the boundary is I think between freedom and veto, sometimes we will agree to….. for the company to stop it for patenting or whatever, but not unreasonably delay that publication going out."* (Interviewee No.31–Pre-1992 university)

Another theme which emerged from the data was the difference which the source of the funding could make. If a company was paying for all of the research, it might be classed as consultancy and these kinds of contracts did not always

include freedom to publish. In these circumstances, the KEO was happy to agree to an embargo on publication and the company retained the right to patent. If public funding was covering all the costs of the research, a company could not have an embargo on publication. If a company was only contributing a small proportion of the costs, a KEO would be reluctant to concede total control over publication of the research. A KEO might also be willing to agree a veto on publication for a specified period in two other circumstances: if the research was more than 10 years old and an academic was not worried about new knowledge coming out of the research, or if the academic already had many publications and felt that nothing could come out of the research.

> *"If the company just said 'no you can't do any publishing at all, we want to collaborate with you'… They wouldn't get TSB* [Technology Strategy Board] *funding."* (Interviewee No.32–PSRE)

> *"To my mind, if industry were coming in asking for those sorts of things which go against the academic research principles, they could do that but only if they pay commercial rate for it."* (Interviewee No.9–PSRE)

An academic or KEO could avoid or circumvent any embargo or veto on publication by anonymising the data.

> *"The way we've got round it is to anonymise things from them, they know we do it and that we anonymise. …. It's very frustrating but, so, yes, that's happened to us. They, you know, pay enough money, they call that tune. On the other hand, if something was awful, if it was really bad, then you'd still have to publish it, wouldn't you. You'd still have to.. but still anonymise it. "* (Interviewee No.25-Post-1992 university

Veto on publication was about academic freedom; there was a fine boundary between freedom and veto; an academic needed to be able to talk about the impact of their research. A KEO could remind the company of its charitable status and the requirement this placed on the KEO about disseminating information. The KEO would look to agree arrangements where the KEO could use the results for teaching and research, and to disseminate them within an agreed framework. What was more important was that when a company was

working with an academic, the academic had the possibility of using the knowledge which they gained from undertaking that particular study in their future research and teaching. The KEO would look to secure agreement that the academic could use any outcome from the research for future public research.

> *"I mean certainly in terms of companies we would be drawing their attention to the charitable status of the university and the requirement that that puts on us with regard to dissemination of information, and we would be drawing up some sort of realistic plan that allowed us to use results to teaching research, eventually to disseminate within an agreed framework, but we would be showing them the Charities Commission stuff that says 'We can't comply with your request."* (Interviewee No.18–Pre-1992 university)

From the research findings, it seemed that most KEOs would refuse to agree to work with a company where the results of the research were predetermined. The common reasons for this were linked to the need to maintain an academic's and a KEO's independence, impartiality and integrity; results and outcomes of research could not be prejudged or predetermined.

> *"Well, because it would just be a money making exercise, without any credibility, and I'd be concerned about the reputation that we developed if we were seen to be just producing a report that somebody wanted us to produce."* (Interviewee No.23-KEO-Other)

> *"We wouldn't ethically do that because the piece of research should be exactly what it is, a research generating new knowledge, you can't prejudge the outcome of that, or to load it in some ways… cheating in research, what is it... plagiarism, or it contravenes research integrity. Because unless you try to establish the truth, and I'm being overly philosophical here, then your credibility, your reputation suffers. "* (Interviewee No.20–Post-1992 university)

It was acknowledged that KEOs and academics should not manipulate data; it was a fundamental principle to be impartial and independent. The other was the need for KEOs and academics to be able to be free to tell the truth and to sustain their reputations. One approach was for an academic to agree to undertake the research, report the results as they were factually and leave it to the company to decide how to use the report. Agreeing to work with an organisation to shape

research to secure a predetermined or known outcome would undermine academic integrity and academic freedom; academics would not put themselves in that position knowingly. As a process, knowledge exchange depended on the rigorous exchange of information and this could be undermined if academics falsified or manipulated information. However, an example was given of how an academic had shaped research to come up with the right answer for the greater good of the region. There was also a fine line between a company wanting to influence the results of research and a KEO giving endorsements.

Most KEOs would refuse to give a company an endorsement for their product or service. Interviewee No.29 (Post-1992 university) gave an example of how their KEO had been caught unawares. A company funded the KEO to undertake research on its health product. The company felt that by recruiting a KEO to undertake research on its product, they could claim it was independent academic research and was not to be questioned. The company and KEO disagreed about how to interpret the results of the research and the wording of the company's press notice about this. The company worded the draft press release in a favourable light, in such a way as to make it seem that the KEO had approved its product. The KEO felt that there could be a reputational risk if the "endorsement" proved to be wrong.

However, there was one kind of exception: companies locating kit free of charge on KEOs' sites in return for an endorsement, whether explicit or tacit. It had become common for companies to loan or give equipment to KEOs free of charge to use in a particular facility to act as a showcase for their customers. These were negotiated on a case by case basis, depending on whether there were strategic benefits to the KEO which justified having a close relationship with a company. Interviewee No.27_1 (Pre-1992 university) gave an example of how a major engineering company provided equipment on the campus free of charge for the KEO to use. The company worked with the KEO to ensure that the equipment and its processes worked, and to develop new processes in collaboration with the KEO. The location at the KEO acted as a showcase for the company's customers.

The responses to these scenarios show how academic values of independence, objectivity, and autonomy underpinned academics' and KEOs' decisions. There were some indications that some boundaries were becoming blurred; for example, in companies locating equipment on KEOs' premises and allowing academics to use them. The next section turns to look at the corporate values that KEOs profess and how these might inform knowledge exchange.

5.3.3 KEO values

This section explores corporate KEO organisational or corporate values, and the extent to which they stand alone or interact with academic values and ethos. In exploring KEO values, the influence of the changing roles and perceptions of KEOs (which are explored in Sections 4.2.1 and 4.2.2, pp.66-76) have to be taken into account. There had also been a shift in understanding in how knowledge which KEOs created and developed was perceived. Knowledge was now seen as a commodity to be exploited; KEOs were producers of knowledge which they had to exploit.

KEOs varied in whether they had a set of organisational values. Values could be at the heart of how knowledge exchange practitioners perceived their KEOs; for others, organisational values were less important. Some KEOs linked their values to their organisational vision and their strategy. Table 5.2 illustrates the kind of corporate organisational values which interviewees mentioned, and how some KEO practitioners could not remember them.

KEO corporate values
"Quality, impact and independence" (Interviewee No.7-PSRE)
"Socially responsible university, serious about inclusivity and committed to improving social mobility. Highest levels of academic professional integrity" (Interviewee No.15-Post-1992 university)
"Excellence, people focused, partnership working, and fairness and integrity." (Interviewee No.8-Post-1992 university)
"An open university that engages as widely as possible and recognises diversity." (Interviewee No.1-Post-1992 university)
"*I'm sure we have, and I've no idea what they are. That tells you something doesn't it? We have, in fact, because I did look them up, but I can't remember what they are.*" (Interviewee No.6-Pre-1992 university)

Table 5.2 Examples of KEOs' corporate values

The corporate values illustrated in Table 5.2 were generic in the sense that they could be found in organisations in other sectors and are unrelated to Mertonian norms.

Some KEOs did not have any organisational values, or if they did, knowledge exchange practitioners were not aware of them. Although it was good to have written values, the real issue was how they then fed into how knowledge exchange practitioners worked. Organisational values were implicit, rather than explicit. "Values" could be replaced by something else, such as a code of conduct or an explicit ethics policy. An interesting example was given of a KEO which had stated its knowledge exchange values explicitly in what they called a "knowledge transfer ethics" policy, so it was embedded. The KEO wrote the knowledge transfer ethics statement because the knowledge exchange office was encountering issues of principle. The knowledge exchange office felt that it was important to make a more formal statement of their expectations. In practice it emerged that the knowledge transfer ethics statement was aligned with the KEO's CSR policy. One interviewee gave an example of how KEO values were applied:

> "We're involved in a piece of work with the local
> authorities and this is in the city, and this isn't about
> ethics at all now, but the business plan that was drawn up
> was incomplete, it was hollow, it didn't have any legs, and
> we said this, and the chap who was chairing this group was
> actually a senior partner in one of the local law firms here,
> and apparently later said to the vice chancellor, he
> couldn't believe what was being said, if it was his
> organisation he said he'd tell his people to get on with it
> and make it work." (Interviewee No.20–Post-1992
> university)

KEO values tended to reflect the KEO's position towards ethical issues in knowledge exchange; KEOs' approach to knowledge exchange ethics could be linked to the kind of organisation that the KEO wanted to be. Some KEOs who were not practitioners took a more detached approach. As funders or commissioners, they felt that they did not have any role in judging ethics. They would not look to make any ethical or moral judgement, but look to see whether the organisations with which they were collaborating recognised the need to

consider ethical issues, when they would have to do so, and the kind of arrangements they would make for this. These KEOs wanted to be assured that companies would apply for ethics approval at the appropriate time, and that appropriate governance arrangements were followed. In some KEOs, ethics were implied in the stage gate process that the KEO used to evaluate and progress potential opportunities. This kind of approach was implicit in how people ran their knowledge exchange offices and how these values informed their decision making.

5.3.4 Knowledge exchange: guidance and reference points

This section explores the extent to which, how and where KEOs provided guidance to knowledge exchange practitioners. In some KEOs, financial regulations sufficed to provide guidance on all aspects of knowledge exchange. This reflected the pattern in most KEOs which tended not to have separate guidance on knowledge exchange issues. Sometimes knowledge exchange issues were covered by KEOs' conflicts of interest policies; other KEOs had a code of conduct. Some KEOs which were funders or commissioners had published some guidance or reference points for grant holders. Examples of these are given in Table 5.3.

Knowledge Exchange guidance	What it is about
Research Integrity Concordat (UniversitiesUK 2012)	Supports research integrity. Sets of the roles of funders, researchers, universities. Not explicit about knowledge exchange
Framework for Research Ethics (Economic and Social Research Council (ESRC) 2015)	ESRC - Covers research and knowledge exchange - If knowledge exchange is seen as part of research, then knowledge exchange is covered. Does not cover dissemination of knowledge exchange
Responsible Innovation Framework (Technology Strategy Board 2012)	Innovate UK- Started as an ethical, societal and regulatory framework and evolved into funding criteria as well. Wanted to make sure the right thing was being done, issues were considered or plans being put in place to do so. Also to provide a process within which to do this and help with monitoring application and use of public money

Table 5.3 Examples of knowledge exchange guidance provided by knowledge exchange funders and commissioners

Other KEOs did not have any explicit guidance on or for knowledge exchange; others had clear policies on intellectual policy and commercialisation. Knowledge

exchange staff were bound like all staff by the KEO's ethics, research integrity, conflicts of interest policies and financial regulations. Some KEOs only had a statement of organisational values. Other KEOs dealt with knowledge exchange issues on a case by case basis; they did not have any knowledge exchange ethics processes or policies similar to those in place for research, or codes of conduct for knowledge exchange. A KEO acknowledged that it did not yet have any formal codes for knowledge exchange, although it was recognised that official guidance would be required in the future. Some KEOs had guidance on aspects of knowledge exchange, such as which kinds of organisations and business sectors with which the KEO would or would not collaborate; for example, not working with tobacco companies.

> *"....there isn't a formal code because we just haven't got there yet. And I don't know whether or not that's us as a university, coming to it fairly late, it may be. But generally, I think that people just aren't sure and I think that sometimes all KE* [knowledge exchange] *type work including commercial work is seen as good because it is KE* [knowledge exchange]*, do you know what I mean?… The priority therefore if it's KE, it's great. Whereas actually, what's going to work now is thinking that well, there are issues as some of the scenarios you've talked about, there are issues with the fact that KE* [knowledge exchange] *isn't great just because it is KE* [knowledge exchange]. *It also needs to* [do] *worthwhile good, important work as well. And I think that those issues will come up, probably a bit further down the line for us really as they start to do a lot of this kind of institutional processes."* (Interviewee No.11– Post-1992 university)

> *"…. we're bound in the same that all the staff are by things like ethics policy, research integrity, conflicts of interest, financial regulations."* (Interviewee No 5–Pre-1992 university)

In the later 1990s, commercialisation and knowledge exchange were not well established or common in most KEOs. The introduction of HEIF and impact had changed this: there had been a culture change in academia. KEOs and academics had modified their stance on "commercialisation" and moved to accepting and embracing knowledge exchange. More academics were aware of the impact of their research and could talk about it positively; academics were

interested in knowledge exchange for economic development and for their own research benefits. In recent years, there had also been a general shift in knowledge exchange away from setting up spinout companies to exploring other means of collaborating with external organisations.

> *"….that there's a pendulum that's swung from pure research out towards commercialisation, and we've gone full circle at all. However, not only have they had the research councils with their poorly communicated "Pathways to Impact", and KE* [knowledge exchange]*, and wanting to report to secure budgets for under future CSRs,* [Comprehensive Spending Reviews] *but in the last 18 months, they've all pricked up like mad, because REF* [Research Excellence Framework] *is coming, and REF has far more money attached to it, and there they're spending an awful lot of time now with REF* {Research Excellence Framework] *because, I think it's 20%, isn't it, of their budget will be coming on the quality of their REF case studies."* (Interviewee No.9–PSRE)

Tacit values would vary among KEOs; it depended on the size of the KEO and the degree of "corporateness" as most academics were usually not "corporate". Academics usually knew what the wide lines were, although they might differ about where the boundaries were precisely. There were grey areas in between with different academics taking different views about what they would need to do to get assurance. Culture could be devolved in KEOs and that faculties tended to manage ethics and projects at faculty level; there was little central control. In some KEOs, institutional processes and procedures were complex and academics circumvented due diligence processes which Finance were meant to undertake. There was a poorly controlled environment, with a clear lack of accountability; there was no partnership and minimal collegiality across the faculties. Some KEOs tended to focus more on securing income and in the race to find funding, KEOs did not always think through the practicalities of what could happen down the line. Further culture change among academics was needed if knowledge exchange was to be successful in the long term.

The findings discussed in Sections 5.3.3 (KEO values) and 5.3.4 (Knowledge exchange guidance and reference points) form part of a broader discussion about KEO culture and ethical climate, and the extent to which these may influence

participation in knowledge exchange. Tierney (1988) proposes a six dimensional conceptual framework (comprising environment, mission, socialisation, information, strategy and leadership) that can be used to analyse KEO organisational culture (Tierney 1988). Fritz et al (1999) argue that management compliance with ethical standards in organisations sets an example for everyone else. Organisational enforcement of ethical standards and dealing with breaches of them as well as open discussion about them may vary at different levels of an organisation (Fritz et al. 1999). Malloy and Agarwal (2001)'s research indicates that organisational (ethical) culture differs between business and not-for-profit organisations; the nature or kind of organisation was shown to be the most significant factor in influencing members' ethical behaviour (Malloy and Agarwal 2001).

The implications of this are explored in Section 7.3.2 (pp.205-208). The next section explores the views of knowledge exchange practitioners on some of the means which KEO used to ensure the governance of knowledge exchange.

5.4 Aspects of governance of knowledge exchange

This section reviews the research findings on the kinds of checks and balances that KEOs have put in place to ensure that knowledge exchange is undertaken responsibly and ethically. These are explored by looking at four examples: managing conflicts of interest, managing spinout companies, managing academic consultancy, and ethics committees.

5.4.1 Managing conflicts of interest

Handling conflicts of interest were a recurrent theme in knowledge exchange as a process, and as an ethical issue. KEOs took different approaches to managing conflicts of interest: some KEOs did not have any guidelines or guidance on this; other KEOs managed conflicts of interest according to current legislation. KEOs' policies, rules and regulations, and employment contracts might not always be complete. Some KEOs worked on a presumption of disclosure of any relationships; others had arrangements in place under which KEO staff had to declare any conflicts of interest, such as registers of interest which were updated annually. In some KEOs, there were penalties for overstepping the mark;

financial regulations were clear about whom KEO staff should be notifying. In other KEOs, the knowledge exchange office asked academics to inform them if they felt that there was any conflict in what they were doing or with whom they were working, the relationships they had. Another KEO had a clause in its consultancy and employment contracts that any conflicts of interest had to be declared; private consultancy had to be approved by the senior management of the academic's school. There were other kinds of potential conflicts of interest, such as where the KEO was placing contracts with companies where staff or their partners were significant shareholders or directors.

> *"Currently a live issue of debate, there is a presumption of disclosure first of all of these sorts of relationships that you mentioned, but we're tidying it up because it's not as water tight as it should be, but if you become a director of a company, it's outside work you're supposed to refer that to your dean who may demand any sort of information on it they need to make a judgment call as to whether that's OK or not."* (Interviewee No.18–Pre-1992 university)

> *"Well, we have a clause in in our consultancy and in the contracts of employment where there's a conflict of interest that has to be declared. So if they want to do it as private consultancy, then the senior management in their school have to approve that. If they don't approve it, you know, it's in breach of their contract."* (Interviewee No.19– Post-1992 university)

One perspective was that managing conflicts of interest was all about declaring an interest and being open about the potential conflict so that the KEO could decide how to minimise the risk. There needed to be impartial oversight of arrangements that were put in place, and these needed to be captured in legal agreements. As long as there was KEO oversight, and decisions about the consultancy or the research were not being taken solely by the founder academic, but by KEO senior line management, this was acceptable; conflicts could be minimised. This could be reinforced with independent oversight by KEO governance arrangements.

> *"That would all fall under our conflicts of interest policy which operates, I would expect, in a similar way to most similar policies elsewhere. And it's all about declaring an interest and being open about the potential conflict so that senior management in the university can make a judgment as to how to minimise the potential for conflict."*
> (Interviewee No.5–Post-1992 university)

Managing conflicts of interest was difficult as academics saw themselves as independent and did not always have any loyalty to the particular KEO where they were working. Academics did not always realise when they had a conflict of interest and did not always see that there could be a problem. An interviewee gave an example.

> *"We have had certainly one case that I am aware of where an academic had his own company, and this was around a KTP, and he wanted to be the academic supervisor and the industrial supervisor and he wanted his post doc to be the associate, and the company was his partner."* (Interviewee No.28–Pre-1992 university)

Academics often did not understand what their legal responsibilities were or where their loyalties lay. Another interviewee felt that KEOs could not control what academics did outside work, so there was the potential for conflict of interest there, even though an academic's intellectual space belonged to the KEO; academics did not work set hours. Many KEO staff could have divided loyalties, not so much with the KEO as their employer, the organisation who paid their salary, as with an external organisation which gave them a title and lectureship.

> *"A lot of our academics they want to work with the universities as well and sometimes that blurs the boundaries, as much as anything that happens in tech transfer. In that they become more loyal to ... Where their loyalties lie, not so much with the paymaster as with an organisation who's giving them a title and a lectureship."*
> (Interviewee No.35–PSRE)

An example of managing conflicts of interest was illustrated in KEOs' policies about academics acting as directors of companies. KEOs differed in whether they were comfortable for academics to be appointed as directors of companies. Some KEOs were wary about appointing academics as directors of companies as

academics were not always clear about in whose interest they were meant to act: the company or the KEO. Many academics did not appreciate what the responsibilities of director entailed and the implications of these. Other KEOs explained that it was acceptable for people to be directors of many companies; it was down to an individual's personal integrity, judgment and ethics in how to manage that. Interviewee No.26 (Pre-1992 university) explained how they had preferred to step down as a director of their spinout companies and chose to act as a consultant to the spinout companies to avoid any conflicts of interest. An academic as a director had to understand where their legal responsibility lay to the company and not to the KEO. Some KEOs provided training or guidance for academics on their responsibilities as a director and the potential conflicts of interest that could arise. One KEO provided insurance for them in case other stakeholders believed that a conflict occurred and held the academic personally liable.

Knowledge exchange practitioners' views partly reflected the literature which stresses how academics tend to misunderstand their legal responsibilities in handling conflicts of interest (Lipton et al. 2004). Lipton et al (2004) conducted a survey at the University of California on academics' understanding of and attitudes toward their institution's conflict of interest policies. Their findings show how academics can fail to understand when conflicts of interest have to be disclosed, and feel that individuals can recognise and manage conflicts of interest on their own (Lipton et al. 2004). While the research findings focused on how KEOs managed conflicts of interest, the literature tends to consider more how conflicts could arise and suggest more effective ways of managing them (Welsh et al. 2008).

The implications of the research findings in this section are explored in Section 7.4.1 (pp.214-217).

5.4.2 Managing spinout companies

KEOs' role in establishing and managing spinout companies is an example of a situation of where ethical issues can arise in knowledge exchange. In the early 2000s, the Government encouraged KEOs to exploit their intellectual property by

establishing spinout companies, as they believed that transferring technology to business could generate significant financial returns (Lockett et al. 2015). Although the rate of creating spinouts has slowed, the need to consider how to manage issues such as conflicts of interest can arise.

In reviewing how KEOs manage spinout companies, four themes emerged in the research findings: policies, governance, academic involvement and incentivisation. KEOs had different views about the desirability of establishing spinout companies to exploit their intellectual property and technology. For some KEOs having spinout companies was a reputational requirement, particularly to have profitable ones; other KEOs only established spinout companies when there was a clear market demand or user need for the company's products or services. Some KEOs preferred to decide whether creating a spinout or licensing was appropriate on a case by case basis, based on the commercial potential of the opportunity. It was usually more appropriate to set up a spinout where the technology was a platform that could be applied in different sectors and there were different applications.

> *"So I think we just need to make sure that we take the*
> *appropriate decisions based upon the commercial potential*
> *of the opportunity rather than just form a spinout*
> *company."* (Interviewee No.30–Pre-1992 university)

Most academics who set up a spinout company relied on KEO resources at some point: there was an open tested process which they had to go through that acted as a check and balance. Many KEOs had some kind of gate or deal progress review arrangements where opportunities were assessed and evaluated before they could progress to the next stage. These arrangements often involved additional representation from other KEO staff not immediately involved in developing the project. The rationale for these kinds of approaches was the recognition that conflicts of interest would always occur and a KEO needed to have enough people involved so that the individuals who were conflicted were not making personal decisions. One KEO was adapting their spinout company model from a generic approach to a range of possible models which offered more flexibility and reflected different degrees of academic and KEO involvement and ownership. Where there was a spinout with intellectual property which was linked

closely to the founder academic, there would be equity and investment coming back to the KEO; the academic was not allowed to negotiate, finalise or sign the deal.

> "…. *across the university we have the concept of IP* [Intellectual Property] *panels. So once you've kind of determined that … there probably is something here, then you would bring that to the IP panel which does have a group of people, both within the faculty and depending on what it is, we construct the panel according to what it is, but it's usually the Associate Dean for Enterprise, and then the review expertise, both business and technology would sit on the panel, look at it and look at the intellectual property that's involved, and assess the commercial opportunity. And if it says, yes, we think that there is something there, there's some intellectual property that make sense to base this on, and there's a commercial opportunity. And then you would move it on up and you would assess, again, looking at what, resources are they going to take to do this? Anyway we have a group here called REAG, which is the Research Enterprise Advisory Group …. and once it's iterated the business plan here to the point where it you have got an assessment of whether it should be, something should be done with it, it goes to REAG Again, this is the associate deans, the enterprise and research people will review it, and they will make the decision then of is it …"* (Interviewee No.27_1-Pre-1992 university)

> "*It's normally by that… we negotiate the deal with and not the inventors.*" (Interviewee No.35 – PSRE)

As taxpayer funding was involved, the KEO's and the spinout's roles needed to be separated. KEOs were aware of the need to show a transparent route to how decisions were made in establishing and managing spinouts. Some KEOs had recognised a need for external advice. An interviewee described how some KEOs had a committee to oversee their spinout companies, involving senior KEO staff and external representatives who were experienced in venture capital. In other KEOs, the audit committee or a senior KEO management group assumed this role.

> *"All universities have a committee that oversees all of their companies and there's some board, often involving the senior key members of the university staff, but also including externals who are very well experienced in venture capital and all the rest, and they will typically hold meetings on a monthly or two monthly basis and review every single company that they're supporting."* (Interviewee No.34-KEO-Other)

Another interviewee explained how the KEO had recognised the need for clarity about its significant investments and how the KEO needed to be seen to consult, to bring an external view on deals that academics were keen to progress. Where KEOs had outsourced management of their knowledge exchange commercialisation services, the external company would assess a spinout opportunity and find an external investor for the development. Some KEOs partnered with the IP Group and some KEOs used other external expertise. Interviewee No 8's KEO (Post-1992 university) was working with a company called Commercial Edge and Interviewee No.16's KEO (Post-1992 university) was collaborating with Exemplas. Interviewee No.8 (Post-1992 university) explained what taking this approach offered.

> *"And you can do different things in different ... you can customise it to whatever you want to do. They're not really the university, so therefore there's not an expectation that you going to do it for nothing, and there's much more clarity about the value proposition. So it might be, they need to bring other things in, that a university couldn't put into the value proposition, because that's not what they're used to doing, whereas if you've got it at sort of slightly arm's length, they can bring other things in to make it more viable and put more value in it."* (Interviewee No.8– Post-1992 university)

KEOs differed in the extent to which academics were allowed to be involved in a spinout. In many cases a spinout was based around an academic's expertise, and the academic would be retained to provide consultancy support, either through the KEO or in a private capacity. Some KEOs preferred to bring in external (entrepreneurial) resources to manage spinouts with the academic retained to provide research input to the business. Other KEOs would not let an academic be a consultant and a director of a spinout simultaneously. Some KEOs preferred an academic to be appointed as a non-executive director of the

spinout rather than take an executive role. In some instances, academics were permitted to take shares in a spinout but were not allowed to take an active role in the company. If an academic wanted to be actively involved, they would have to leave the KEO and work for the spinout. Some KEOs used to give academics a choice: to be a director of the spinout or stay with the KEO. In other KEOs, an academic's head of department had to agree to an academic's time being bought out or preserved so that they could work for a spinout company within their official time. Many founder academics stayed with the KEO providing research input to a spinout with the KEO's approval, either acting as a consultant or sitting on the company's advisory board. Many KEOs would rather keep academics happy doing research rather than lose them to the spinout.

> *"…. the vice-chancellor had a simple rule for an academic who was thinking of becoming a director of a spinout company. He would say to them, 'What would you like to do? Would you like to become a director of the company, or would you like to retain your academic post?' So they would have to make a choice and, of course, nine times out of ten, they didn't want to give up their academic post. So, I encouraged that because, having come from business, I don't think being a director of company is a part-time job. And actually academics don't make good directors of companies."* (Interviewee No.23–KEO-Other)

KEOs were aware of the potential risks and consequences that could arise in establishing spinout companies. A point could come where decisions, which an academic who was a director of a spinout needed to make for the company, could conflict with the KEO's interest. An academic could become closely involved with a spinout company as it was based around their knowledge and expertise; they could become territorial about it, and the KEO had to stay alert to this. Academics tended to start extracting value from the KEO for the spinout rather than gain for the KEO. There could be a problem where an academic was appointed as a director, and the spinout company contracted back to the KEO. An interviewee highlighted what could happen where the KEO placed a contract with the KEO.

> *"There comes a problem when the university, when it contracts back to the university, and the sort of preferential rates that can sometimes go on for use of facilities, and, it does happen in terms of, "we'll work together to do these things", it's a public…, in principle, well, it's a partnership, but I think that's where when the people are wearing the two hats. It's like they tend to extract for the company rather than gain for the university or the laboratory."* (Interviewee No.15–Post-1992 university)

Most KEOs had a reward to inventors' scheme where founder academics could be awarded a shareholding in the spinout or some kind of financial reward. The form and amount of reward could depend on the extent of the academic's involvement in the spinout company. Some KEOs felt that it was bad practice to allow academics to double dip; i.e. to take a royalty on sales of the intellectual property licensed to a spinout company and also hold shares in the spinout company. In some cases, if the academic stayed with the KEO and their intellectual property was exploited, they would receive a specified net percentage of the returns. If the KEO created a spinout or a joint venture, it tended to give inventors shares rather than royalties on sales. In some instances inventors decided among themselves the relevant percentage shareholdings they should have in the spinout company. This would usually be based on what the inventors felt that they had contributed to the intellectual property which was being commercialised through the spinout.

The findings on how KEOs manage issues that can arise in establishing spinout companies are echoed in the literature on conflicts of interest. In their study of five case studies in the Faraday Partnership (a Government and research council funded initiative which was expected to encourage closer contact and exchange between KEOs and business), Ankrah et al (2012) find that academics who hold shares in spinout companies can damage their standing as independent and objective researchers and find their commitment to their KEO as their employer questioned. Ndonzuau et al (2002) observe that potential conflicts of interest can lead to a situation where a spinout in which an academic holds shares can gain access to KEO resources and infrastructure at cheaper rates. This leads the KEO subsidising the spinout's activities (Ndonzuau et al. 2002). The implications of this are explored in Section 7.4.1 (pp.215-216).

5.4.3 Managing academic consultancy

KEOs differed in how they approached managing academic consultancy, in the amount of time academics were given to undertake consultancy, and whether they could retain fees which they received. Table 5.4 illustrates this.

KEO arrangements for academic consultancy
Not given official time to do consultancy
Allowed 30 days a year to do consultancy through the KEO
Allowed to do consultancy but the payment for the work has come back through the KEO
Given official time off to do consultancy
Academics were not given a certain number of days or percentage of their time to carry out consultancy
Undertook consultancy within their workload as part of their job - not given an allowance of consulting days a year
Must not compete with the KEO - included as a clause in their contract of employment. Should not bring the KEO into reputational disrepute and there must not be a conflict of interest
Academics given 20 days a year to do consultancy through the KEO where they were paid 70% of the fee. If they wanted to do it as private consultancy, academics had to declare it as a potential conflict of interest
Academics had 50 days a year to do self-employed consultancy. If the KEO wanted them to do these activities, they would buy the time off the academics
Academic could undertake private consultancy provided it did not clash with their day job and their director approved
If an academic wanted to work for a spinout company or undertake consultancy, the KEO would either fund it or reduce their hours
KEO did not acknowledge that academics had any other time to do consultancy
Most academics did consultancy either through buying out their university time or through the KEO for their own protection.

Table 5.4 KEOs' arrangements for managing academic consultancy

This was one area where differences between pre-1992 and post-1992 universities could be identified. Post-1992 universities, which were mostly former polytechnics, had retained their former local authority employment terms and conditions; these did not give academics an allocation of time to undertake consultancy. In some KEOs academics had teaching and income targets, and in some other KEOs, academics only had teaching targets. In other KEOs, academics could do as they wanted as long as they were reaching their research and teaching targets. Some KEOs encouraged academics who wanted to

undertake private consultancy to make arrangements through the KEO so that the KEO's insurance covered them. Other KEOs set strict conditions when academics wanted to undertake private consultancy, usually as part of their employment contract; the KEO was happy that an academic could use the same skills in undertaking private consultancy as they used on their day job but apply them in a different area. Interviewee No.8 (Post-1992 university) gave an example of where a KEO professional service, ICT (Information and communications technology), wanted to do external consultancy. The knowledge exchange office did not agree with a service function undertaking external consultancy as it created a conflict of interest.

The implications of the conflicts of interest that can arise from academic consulting are explored in Section 7.4.1 (pp.216–217).

5.4.4 Ethics committees

The role of KEO ethics committees in knowledge exchange is explored in this section. Ethics committees were a relatively recent phenomenon. Negative publicity around ethical breakdowns in KEOs in the nineteen nineties had led the Government to require that all KEOs should establish an ethics committee, and this became a condition of government funding. Any university receiving any Government grants had to set up an ethics committee.

> *"…15 years ago there were….. there were isolated cases which got a lot of publicity of a poor ethical approach… I would think there are probably 15 cases across the whole of the UK per year of ethical breakdown, so in terms of total business of all the university sector, this was in the noise, but the trouble is it got a lot of very negative publicity, and so …. it came as a Government requirement that all of the universities should establish ethics committees… But it's … Government through the Higher Education Funding Council, it became a condition of universities receiving any government grants that they must set up ethics committees. Government wanted ethics not to be discussed say by a research committee as part of that; Government wanted ethics to be seen as a stand-alone very important item."* (Interviewee No. 34-KEO-Other)

The views of knowledge exchange practitioners revealed that the role of ethics committees in KEOs varied. KEO ethics committees differed in the range of their responsibilities and their activities; there was an apparent inconsistency in the role and scope of KEO ethics committees. Some ethics committees seemed to focus on research ethics, although KEO senior management would make the final decision. For some KEOs, knowledge exchange was an extension of research which was already underway and logically the ethics committee dealt with knowledge exchange ethical issues. Some ethics committees included knowledge exchange projects in their remits and others focused more on research. In many KEOs, the process seemed to rely on academics referring projects where ethical issues arose to the ethic committee for review so that a KEO's policy could be discussed.

In some KEOs, the departmental ethics committee had to consider any consultancy or research grant proposal and the head of department had to approve it. In other KEOs, any project that involved human participation, even if it was web based and did not involve holding any personal data, needed to secure ethical approval. If an academic was looking at a business process, this would not need ethical approval, but if an academic was asked to undertake a customer survey for a company, this would need ethics approval. In other KEOs anything that went through pre-award which was a research grant had to have ethical consideration and sign off. In some KEOs, ethics approval would be concerned about how the data was collected and ensuring that participants could give informed consent. In some KEOs, the ethics committee only considered a knowledge exchange project if it involved human or animal subjects. KEOs had an ethics committee, but not an exploitation ethics committee. In other KEOs, ethics involvement was implied and was handled through the gate review process where ethical issues could be considered and addressed.

> *"I think if you heard that it would raise issues that would go…. Well, doesn't sound morally right but there are ethics committees, that issue you would hope would be flagged up. There isn't an exploitation ethics* [committee] *…"*
> (Interviewee No.31–Pre-1992 university)

Many KEOs had a hierarchy of ethics committees at departmental, faculty and corporate levels; any potential ethical issue was escalated to more senior fora to consider. In most cases, KEO ethics committees had an advisory role; senior KEO management was responsible for making final decisions. An ethics committee might have decided that a KEO should not do something or collaborate with an organisation, such as a tobacco company. If an academic was not sure about something, they would refer it to the ethics committee; this gave a KEO an opportunity to explore the issues and rationalise them, to see whether there were any real areas of concern that could compromise its position. Where a KEO applied to other funders for support, such as the National Institute for Health Research (NIHR) for funding, it would have to have to comply with the funder's ethics due process. Where KEOs were funders or commissioners of knowledge exchange, they tended to ask companies to recognise at what point they would need to go to an ethics committee for approval. In some knowledge exchange units, KEO staff could undertake research on students and did not need to go through ethics clearance. This reluctance to broaden the role of ethics committees to embrace knowledge exchange raises questions about ethical boundaries in knowledge exchange and this are explored in the next section.

5.5 Ethical boundaries and issues

5.5.1 Ethical boundaries

This section explores the ethical boundaries or limits within which knowledge exchange operates, and the extremes to which KEOs and knowledge exchange practitioners could go. Many of the issues discussed in this chapter so far touch on ethical boundaries or are ethical boundaries in their own right. In exploring ethical boundaries, there is a risk of confusing the boundaries or limits of what is appropriate or moral to do, how to act and behave, with ethical issues or concerns themselves. So this section explores the margins or areas within which knowledge exchange can operate ethically and tries to define them.

According to the research findings, ethical boundaries can be classified into seven categories: do no harm, what the law allows, end use of research,

exploitation, duty of care, reputation, and independence and integrity; these are summarised in Figure 5.8.
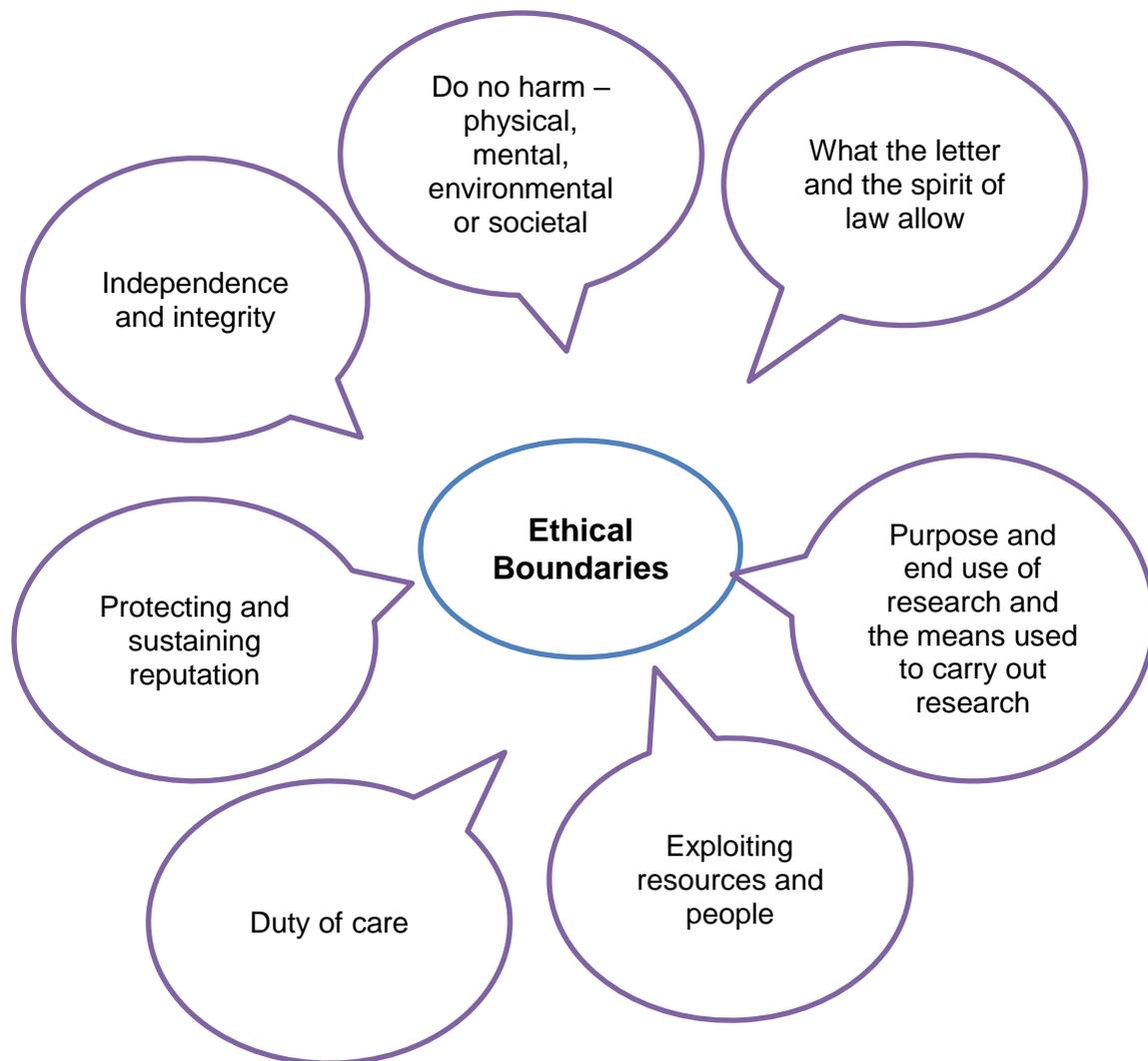
Figure 5.8 Ethical boundaries in knowledge exchange

One of the most common ethical boundaries which knowledge exchange practitioners mentioned was "not hurting anyone". Ethical boundaries in this category focused on different kinds of harm; a consensus was that a KEO's knowledge exchange activities should not intentionally cause anyone, society or anything any kind of harm, or do anything that could cause harm to people intentionally. Similarly KEOs did want not to do business with organisations which harmed people intentionally or knowingly contributed to harming people intentionally. Several different kinds of harm were identified in the research

findings: mental, physical, environmental: harm to the KEO, harm to the academic, and harm to KEO intellectual property if it was not exploited. Examples included a KEO being involved in developing chemical warfare agents or working with countries that were clearly had a dubious record in terms of security. Other examples included damaging society in some way, such as increasing gambling rates among adolescents, working with tobacco companies, or doing research that could promote a harmful activity or harm society in some way. Some KEOs were less sure about animals as many KEOs had an animal house. KEOs wanted to be seen as environmentally responsible; they would not do anything that could cause harm or create the perception that they had caused environmental damage. One KEO included a conscience clause in their intellectual property policy, where the KEO retained the right to notify the appropriate bodies if it found a piece of research, or an activity it was paid to do which would adversely affect people.

> *"… where you wouldn't be developing chemical warfare agents or working with, with countries that clearly had a dubious record in terms of security."* (Interviewee No.14–Post-1992 university)

In the research findings, end use was an ethical boundary in two ways: the purpose or how the results or outcomes of the research would be applied, and the means used to conduct research. If a tobacco company wanted to work with the KEO, the proposed end use or purpose of the research, such as discouraging or promoting smoking, could be a deciding factor. On the other hand, there was a question of the extent to which the end use of research could be identified at the start of the research. However, a different end purpose could dissuade a researcher from undertaking particular research. Some KEOs would not undertake research where the purpose of the research was inappropriate; for example, promoting the take-up of smoking. This could be perceived that the KEO was undertaking unethical research. Other knowledge exchange practitioners were concerned about how a KEO's collaborator operated and made its money, such as through exploiting people in the developing world, particularly in Africa. Although KEOs tended to have policies about not working with tobacco companies, few KEOs seemed to have any guidelines on the ethics of end use.

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> *"There are ethical standards of behaviour for researchers within our research grants, but I don't think we set guidelines for the ethics of the potential end use."*
> (Interviewee No.9-PSRE)

There were concerns about the prospect of KEOs' research being used by outside organisations to exploit people in the developing world. KEOs had to ensure that they did not do anything ethically irresponsible; for example, a KEO could get into trouble over child labour in Pakistan when buying new uniforms. There were reservations about working with governments who were in conflict with countries from where their students came.

KEOs had a duty or responsibility of care to several different kinds of constituents or stakeholders: students, staff, and academics in KTPs and to society. A KEO had a duty of care to sponsored Masters students and student placements. As an employer, the KEO had a duty of care to its staff. KEOs also had a duty of care to ensure that patient data did not get into the wrong hands. Interviewee No.29 (Post-1992 university) gave an example of how an academic at their KEO exploited resources and took advantage of the power and influence in their relationships with their PhD students by taking up a contract worth more than £100,000 as private consultancy, and requiring their PhD students to undertake the work.

> *"And then there was somebody who essentially was doing some large consultancy that was using our PhD students, I mean quite large because they had a contract in excess of £100,000 and the university was phoned up by the client saying "You're not delivering on this contract" and we said "What contract?" because it wasn't with us. And eventually after this all came to light, that person ended up being dismissed as well."* (Interviewee No.29–Post-1992 university)

There were concerns that KEOs should stay within the scope of and comply with the law. These included legal boundaries such as criminality, environmental responsibility; for example, not stealing or using other organisations' intellectual property or seeking to circumvent competitors by trying to bypass UK or EU competition law. KEOs would not do anything that would be criminal or work with an organisation which acted criminally, or had done anything criminal. However,

KEOs were most concerned about working with legal, viable organisations and companies which were contributing to the UK economy, were paying their taxes, and not doing anything illegal, immoral or inappropriate. So for some KEOs, the fact that tobacco was a legal product could in some instances be used as a justification to work with tobacco companies; funding which came from the profits from the sale of tobacco was legitimate. Other KEOs were less concerned about the ethics of the nature of their business. Some KEOs felt that a key criterion was whether the Government did or was prepared to collaborate with an organisation. If it was, this reassured KEOs; for example, working with tobacco companies.

Knowledge exchange was about helping companies to innovate and KEOs did not want put road blocks in the way; so long as it was within the law, it was acceptable. Some KEOs included provisions in their research contracts that pharmaceutical companies were not allowed to use the data in a particular way or to truncate them; how they could use the information must be transparent and comply with data protection and human rights law.

> *"And it is all incorporated into the particular research contract itself. They were not allowed to use these data in a particular ways, truncate them, or whatever. The way they used the information must be transparent, subject to the Data Protection Act, and the Human Rights Act."*
> (Interviewee No.3–Post-1992 university)

"Other ethical boundaries" could be grouped into those around behaviour and reputation. Ethical boundaries would be assessed individually as KEOs were very sensitive; there was potential to damage their reputation if they became involved in the wrong projects, especially as KEOs were big businesses who worried more about their branding and public relations; anything that could infringe, damage or threaten a KEO's reputation was a significant ethical boundary. Protecting the reputation and integrity of a KEO was paramount. Different sectors and kinds of business had different ethical boundaries; there were more unethical working practices in particular sectors. As KEOs were in the public sector, those who worked there received public funding, and should do things properly; deals should be done openly and transparently rather than under the counter.

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> *"Yes I mean all of those would be individually assessed and universities would be very, very sensitive, because of course there's lots of potential for incredibly bad PR if they get involved in the wrong projects, and universities as we've already said are very big businesses and will.. and in my experience of university … we'll spend more time being concerned about downstream branding and PR issues did."* (Interviewee No.34–KEO-Other)

Independence of academic thought was paramount; KEO staff, including knowledge exchange practitioners, could not be told what decision or result they were going to come to; academics should not have their opinion swayed. As part of this, knowledge exchange practitioners had to rely on their own personal integrity and judgement, their own sense of what was right and wrong. Knowledge exchange practitioners should always try to be professional in how they engaged as it was not about the ethics of the project; it was the ethics of the situation. Most academics would not do anything inappropriate or immoral, but senior staff came under great pressure. Academics wanted to take a truthful line. KEOs' ethics policies did not always seem to apply to knowledge exchange; they tended to apply to research and teaching only. Some knowledge exchange practitioners felt that knowledge exchange's ethical boundaries were the same as the KEO's. An interviewee summed up the position on knowledge exchange ethical boundaries.

> *"The question is the intent. So would you say that there are positive boundaries that the KEO? Yes, there are. There are things like criminality; they're like environmental responsibility, and so on."* (Interviewee No.1–Post-1992 university)

In the next section, the views of knowledge exchange practitioners on the kind of ethical issues which concern them are explored.

5.5.2 Ethical concerns

Many of the ethical issues which concerned knowledge exchange practitioners are discussed at several points in this chapter. This section captures the main ones which tend to overlap to a large extent with ethical boundaries. Figure 5.9

gives an overview of the eight kinds of ethical concerns which emerged from the research findings.
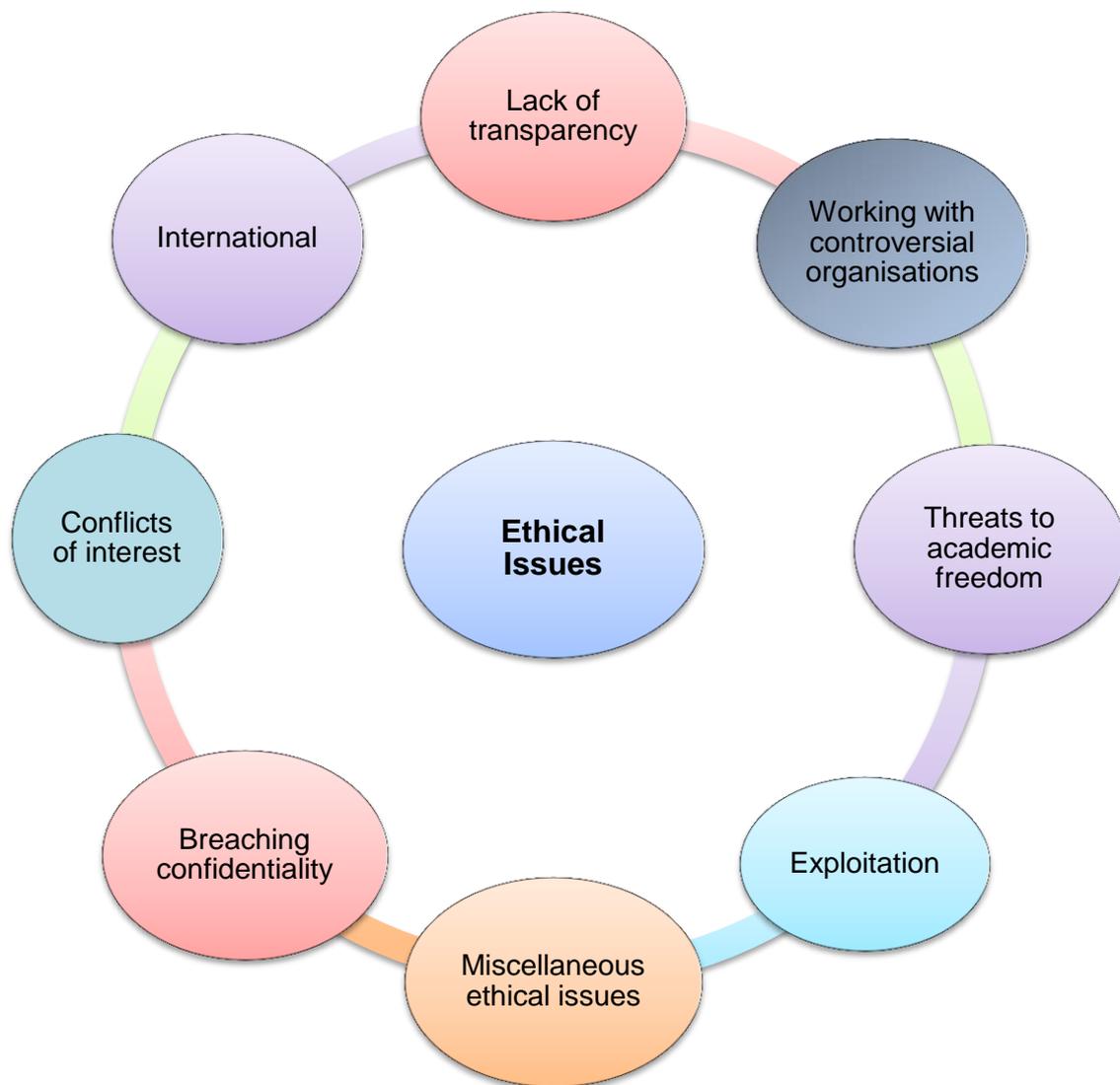
Figure 5.9 Overview of ethical concerns in knowledge exchange

Lack of transparency as an ethical concern raised several issues. The most significant one was a KEO or an academic having different ethical approaches in their relationships with business and other outside organisations from those which they had in research and teaching.

> *"…. we have had issues of lack of transparency of companies and... public contracts, where academics have not been open about their roles, and there are processes, so this office knowing how you can easily look things up and it's not actually complicated, secret information, but I mean we have had I think just once instance of an academic colleague who was not applying best practice in terms of openness and transparency, and that we were able to deal with it, with our existing provision."* (Interviewee No.18–Pre-1992 university)

Maintaining confidentiality could be an ethical issue; for example, sharing sensitive information about an organisation or activity with those who could be affected adversely, or breaching confidentiality of patient data. Breaching confidentiality was seen as an ethical concern as it reflected a lack of professional respect.

> *"And so I don't know whether you spotted there's been a recent case at Birmingham University where the academic published a paper which contained some confidential company information without their approval."* (Interviewee No.34–KEO-Other)

Conflicts of interest were also an issue: for example, when an academic established their own company to exploit research undertaken through their KEO, and did not declare any conflicts of interest. The other main concern was KEOs and academics being secretive, not being open about the kind of research they undertook and their other activities when Government or other public funding supported these.

> *"So we have got academics who have their own exploitation company. So they put their research through the university and then exploit it through their private company, and there's no declaration of interests. So you can, can't stop it. You have them, taking their research outputs and paying for patents themselves"* (Interviewee No.2-Post-1992 university)

Another concern was KEOs or academics doing deals in secret or trying to circumvent a KEO's processes, checks and balances. There was a concern about how some academics did not explain or account for their role or involvement, or had an interest in companies or organisations which the KEO might invite to tender or with whom they might place a contract. This could also

be an example of a conflict of interest. There was a risk of companies inviting KEOs to undertake research on their products and how this could become an endorsement: the boundaries between research and consultancy could become blurred and threaten the integrity of both of them.

Working with controversial organisations such as tobacco companies and defence organisations, particularly defence for attack, was seen as an ethical concern.

> *"......so we were working with the RAF for some time, developing a piece of software for.. basically meant their missiles were better targeted than they currently were, and another academic was arguing profusely against this because how can we work with defence organisations? Because ultimately their aim is death and destruction and, you don't know, even if you're maintaining the right to work with the UK Air Force, who knows who they might go to sell that same technology to some other force."*
> (Interviewee No.20–Post-1992 university)

Working with tobacco companies was perceived as unethical as this was a product that could kill humans and could damage a KEO's reputation. Some KEOs disagreed with this and argued that tobacco was a legitimate product and so was within the scope of the law. Another aspect of this was that some KEOs had large health faculties and it would be hypocritical for another part of the organisation to collaborate with a tobacco company. Some knowledge exchange practitioners thought that testing on animals or tissue samples was an ethical issue for them. Some interviewees were unhappy about KEOs working with companies that made their money out of other people, such as gambling. Working with pharmaceutical companies could raise ethical concerns; for example, when the business wanted to charge a premium to people in a third world country for a drug invented by the KEO. Concern was expressed about how pharmaceutical companies in the US had manipulated the data to improve the results of drug trials, or could take advantage of the NHS by charging excessive prices for drugs or medical devices.

Threats to academic freedom were a significant area of concern. The main one was constraint being placed on academic research which could arise in several ways (Section 5.3.2). This included academics being asked to undertake

research or activities that were counter or against public policy. Open access publishing was seen as an ethical concern as arts and humanities academics felt that STEM dominated the arrangements and there much debate about this. Arts and humanities academics felt that a longer embargo period was needed and so access would be restricted longer.

> "…… *there are a lot of debates in the arts and social sciences community about this* [open access publishing]*, because they view it as something that has been imposed from this STEM perspective, around green and gold. So we say we're going to go for gold but green's acceptable… And on green, what we've said for arts, humanities and social sciences twelve month embargo period. "Oh, that's too short," they say. The reason being that actually articles, they're so long, particularly in arts, you've got monographs. … So they're very expensive to publish, they have a longer half-life of citation than science journal publications. So the idea is that if you can't pay the article processing charge to get gold or open access, that you should be green, and that you should have this embargo period so that the journal has a chance to recoup their money. So you're restricting access.*" (Interviewee No.7– PSRE)

Ethical issues in exploitation covered three main areas. The first one concerned academics and KEOs who wanted to exploit someone else's intellectual property or idea without their agreement or having any rights to do. The other issue was KEOs or academics who gave away for free intellectual property which had been developed with public funding. The other area involved KEOs and academics working with companies and organisations whose business and activities involved exploiting people in the developed world, particularly Africa, or KEOs being involved in supply chains that involved third world countries. The third concern was KEOs working with countries or organisations which had poor human rights records.

> *"Well, the concerns are kind of broader concerns about how that company is operating and making its money, and may be exploiting people in the developed world, especially, especially in Africa. So, you know, from a personal point of view, I would like to think that a drug company was making a reasonable amount of money, you know, in those markets where people can afford it, but, not exploiting, poor buggers in the developed world that are dying because they can't get access to drugs and treatment."* (Interviewee No.23-KEO-Other)

Some knowledge exchange practitioners had some ethical concerns which could be classified as international issues; for example, where a local company was owned by a foreign company and whether a KEO would want to work with its competitor in another country. Licensing curricula to overseas organisations such as government bodies could raise ethical concerns; for example, where the local culture included issues that would not be acceptable in the UK, such as the position of women, and the dilemma was whether the KEO should adapt the curricula to meet local cultural requirements. A related issue was whether KEOs and academics should set up campuses or run courses in countries which had poor human rights records or were undemocratic. Linked to this was whether KEOs could work with governments that were in conflict with countries from where their students came. There was a lack of policy on collaborating internationally on commercialisation projects. KEOs were about the free exchange of information, and a balance needed to be struck between trying to persuade academics to concentrate more on knowledge exchange within the UK or with UK companies.

> *"So we're taking curricula and licensing them to overseas organisations often government bodies, to deliver those curricula in their local contexts. But that's a culture where there are fundamental cultural things that would not be acceptable in the UK, and the way women and homosexuals are treated in certain Islamic countries would, for example, would be a classic. You then have as part of your contract negotiation how you deal with things that would be an absolute must here, would not work culturally in another country."* (Interviewee No.5-Pre-1992 university)

There were a group of miscellaneous ethical issues that encompassed a range of concerns. These included the amount of resources being spent on knowledge

exchange when it was not relevant to real need on the ground which needed addressing. Another area was KEOs making business decisions under undue influence or pressure, or making business decisions that overrode any ethical concerns. Similarly, KEOs or academics collaborating with suspicious partners and receiving significant gifts was seen as dubious. Hampering the development of science was flagged as an ethical issue. A lack of duty of care to students, staff or KTP associates, and for students on foreign placements or internships was also seen as an ethical responsibility for KEOs.

> "*So the question is, do parents when they put little Johnny into a university, consider that the university has a duty of care to the student and to the environment in which they work?*" (Interviewee No.2-Post-1992 university)

Sometimes academics could have divided loyalties between their employing organisation who paid their salary, and the KEO which gave them an honorary title and lectureship or professorial role. A KEO or academic could cause different kinds of harm such as physical harm, mental harm, or reputational harm.

5.5.3 Ethical boundaries and ethical concerns

The discussion in Section 5.5.2 showed the ethical boundaries and ethical concerns could overlap. Comparing ethical boundaries and ethical issues which emanated from the research findings, seven ethical boundaries and eight ethical issues were emerged. These are summarised in Table 5.5.

Ethical boundaries	Ethical issues
Do not harm	Lack of transparency
What the letter and spirit of the law allows	Working with controversial sectors and organisations
Purpose and end use of research	Threats to academic freedom
Exploiting resources and people	Exploitation
Duty of care	Breaching confidentiality
Protecting and sustaining reputation	Conflicts of interest
Independence and integrity	International issues
	Other ethical issues

Table 5.5 Comparing ethical boundaries and ethical issues

This shows that exploitation of people and resources is common to both: as an ethical boundary and an ethical issue. Although ethical issues seem to be more

about values such as threats to academic values and lack of transparency, independence and integrity are ethical boundaries.

Interviewee No.30 aptly summarised the question of ethics and knowledge exchange.

> *"I think we have to have trust and faith in the ethical stance of the university and I think that when we…, which I think comes back to my point about the 'is knowledge exchange different?' …. the work of the ethics committee some years ago and my view at the time was well it's exact.. if we embrace the same ethical sort of quality and standards and things that we do in our research, then that's what we should do. I don't think we can have a different level of ethical stance because of our business or enterprise relationships. We have…, as an institution we sign up to certain behaviours and ways of thinking and that applies to whatever we do."* (Interviewee No.30–Pre-1992 university)

5.6 Conclusion

This Chapter has looked at what the research findings have revealed about the ethos of KEOs and how this applies to knowledge exchange by considering the relevance of CSR, academic and KEO values, and ethical boundaries and concerns.

CSR was perceived as mutual, for knowledge exchange practitioners; CSR and ethics were seen as interchangeable. The ethical dimension of CSR had several components, such as public good and broader social responsibilities which were linked closely to KEOs' roles. CSR was inherent or implicit in KEOs' mission and values and among academics. Most people worked for KEOs because they valued something about the place; they believed in what they did. Some KEOs sought to undertake the kind of projects which would not maximise financial return, but would optimise benefits for the population. These three aspects (ethics, community and inherent) link CSR in KEOs with knowledge exchange: KEOs exploiting knowledge and technology for social good, ensuring that the knowledge a KEO had was used for the best intention and best advantage, using their knowledge to answer social questions and transferring the knowledge to partners.

Concepts of academic ethos and values were still valid. Academic freedom was seen to be an integral element of academic ethos: an academic being able to choose what to research to undertake and how, deciding with whom to collaborate, and having the ability to use knowledge they gained from in research in future studies. If academics were not open, truthful and independent, they would lose their status, promotion, their networks, and their research outputs as no one would want to use them. In the research findings, across all KEOs, integrity emerged as the most highly rated academic value, followed by reputation, independence, public accountability, credibility, and then by transparency and trust which were ranked equally ranked.

Concerns that knowledge exchange threatened academic standards and academic freedom were real; academics were under severe pressure to publish, generate knowledge and ideas, and engage more with outside world. The introduction of impact meant that academics were tending to modify their anti-commercialisation principles. Stronger academics were willing to engage with knowledge exchange and impact, and used their judgement to strike the right balance between knowledge exchange and research. The responses to the scenarios, which explored how academic values were applied in knowledge exchange, showed how academic values of independence, objectivity, and autonomy underpinned academics' and KEOs' decisions. There were some indications that some boundaries were becoming blurred; for example in companies locating equipment on KEOs' premises and allowing academics to use it.

KEOs varied in whether they had a set of organisational values. KEO values tended to reflect the KEO's position towards ethical issues in knowledge exchange. Some KEOs who were funders or commissioners felt that they would not look to make any ethical or moral judgement, and check whether the organisations with which they were collaborating recognised the need to consider and manage ethical issues. Most KEOs tended not to have separate guidance on knowledge exchange issues. Sometimes knowledge exchange issues were covered by their KEO's conflicts of interest policy; other KEOs had a code of conduct, and some KEOs relied on their financial regulations.

Conflicts of interest were a recurrent theme in knowledge exchange and KEOs took different approaches to managing them. Managing conflicts of interest was difficult as academics saw themselves as independent; they did not always realise when they had a conflict of interest; they did not always see that there could be a problem, understand their legal responsibilities, or recognise where their loyalties should lie. One perspective was that managing conflicts of interest was all about declaring an interest and being open about the potential conflict.

The views of knowledge exchange practitioners revealed that the role of ethics committees in KEOs varied; there was an apparent inconsistency in their role and scope. Some ethics committees seemed to focus on research ethics; other committees included knowledge exchange projects in their remits. In most cases, KEO ethics committees had an advisory role; senior KEO management was responsible for making final decisions.

Ethical boundaries could be classified into seven categories: do no harm, what the law allows, end use of research, exploitation, duty of care, reputation, and independence and integrity. Ethical boundaries in this category focused on different kinds of harm; a KEO's knowledge exchange activities should not intentionally cause anyone, or anything, any kind of harm. Working with controversial organisations such as tobacco companies and defence organisations, particularly defence for attack, was seen as an ethical concern; anything that could infringe, damage or threaten a KEO's reputation was a significant ethical boundary.

This chapter has explored how knowledge exchange practitioners' perceptions of the values and culture of KEOs and of knowledge exchange. In the next chapter, Chapter 6, the implications and significance of the research findings are considered in the light of the literature to explore possible emerging features of the landscape of Responsible Knowledge Exchange.

Chapter 6:   Elements of Responsible Knowledge Exchange I

6.1   Emerging features of Responsible Knowledge Exchange

This Chapter 6 and the next one (Chapter 7) define the features of Responsible Knowledge Exchange. The conceptual framework set out in Figures 1.2 (Section 1.3, p.10) provides the starting point for generalising beyond the research findings set out in Chapters 4 and 5, and for comparing them with the issues and themes which emerged in the Literature Review in Chapter 2.

The objective of this research is to explore the concept of Responsible Knowledge Exchange by investigating the interaction of social responsibility and ethics with knowledge exchange. The research questions, which act as signposts towards the landscape and main features of Responsible Knowledge Exchange, are:

1.   What are the scope of and rationale for knowledge exchange?
2.   How is CSR applied and practised in knowledge exchange?
3.   What are the ethical boundaries and underpinning values of knowledge exchange?

An overview of the main features of the landscape of Responsible Knowledge Exchange can be glimpsed in the themes and issues which emerge in the Literature Review in Chapter 2 and the research findings in Chapters 4 and 5. However, the emphasis on some of them differs in the literature and the research findings; these differences may offer new insights. For example, KEO culture and ethical climate are emerging themes in the research findings and these do not appear in the Literature Review (Chapter 2).

Figure 6.1 summarises the main emerging features of Responsible Knowledge Exchange. This provides a more detailed view of the content of the shaded part in the middle of Figure 1.1 (Section 1.3, p.9) where the areas of knowledge

exchange, CSR and business ethics intersect and overlap. Moving clockwise from the top of Figure 6.1, the discussion in this chapter focuses on the first three hexagons: roles and perceptions of KEOs, dimensions of knowledge exchange (scope, drivers and benefits), and engagement. The remaining three (KEO-CSR, knowledge exchange ethos, and knowledge exchange values and ethics) are examined in the ensuing chapter, Chapter 7.

Figure 6.1 Emerging elements of Responsible Knowledge Exchange

6.2   KEOs' roles

Understanding the scope of and rationale for knowledge exchange requires an appreciation of its position within and how it is linked to KEOs' other roles. The research findings focus on four aspects of KEOs' roles (Section 4.2.1, pp.66-72) and these are considered here in the light of themes which emerged in the Literature Review (Section 2.3, pp.20-29).

6.2.1   Changing roles of KEOs

Some of the changes in the roles of KEOs have been linked to the emergence of academic capitalism (the apparent increasing influence of business and other external influences on KEOs), the triple helix (the apparent convergence of the roles of KEOs, government and business), and changes in the nature of research from pure ("Mode 1") to more applied ("Mode 2") research (See Section 2.3.4, p.25). Although KEOs are complex organisations and have multiple objectives (Bercovitz and Feldman 2006), the research findings show that KEOs have four key roles: a big business, research, teaching and community. The implications of this and how they interconnect with understanding the position of knowledge exchange are considered next.

6.2.2   Knowledge businesses

The research findings (Section 4.2.1, pp.66-67) show that KEOs are run like large, academic led businesses. While the introduction of business practices and language into KEOs is discussed in the literature, KEOs tend to be perceived as public sector organisations and many of them are established legally as charities through their royal charters (Morgan 2015b). KEOs can be described as "knowledge enterprises" (Rinne and Koivula 2005) or as part of a knowledge based service industry (Abdul Razak et al. 2014). KEOs trade knowledge and academics are a pool of knowledge resources to be exploited commercially through research, teaching and knowledge exchange (Kok et al. 2010; Abdul Razak et al. 2014).

The research findings indicate that KEOs are seen as places to teach, not as places of learning. Many academics see their main professional objective as educating students (Mendoza 2009). Although teaching and research are seen to be interrelated aspects of KEOs' roles, KEOs can find it difficult to meet expectations in both research and teaching (Sánchez-Barrioluengo 2014). As large businesses, KEOs now provide educational products and services (Parker 2011). KEOs face increasing pressure to be profitable, to find new sources of funding (Abdul Razak et al. 2014), and to become more business aware and business-like (Kok et al. 2010). KEOs run and value courses for which they can

charge fees and attract funding (Kayrooz et al. 2001). KEOs compete for students and for funding at home and internationally (Ehrich et al. 2011); each KEO is trying to establish their own profile, identity, and reputation (Kok et al. 2010; Nadeem and Kakakhel 2012).

There is a strong debate about whether students should be educated for employment, or for their cultural and intellectual development (Bond and Paterson 2005). Investing in and acquiring a higher education is now seen as a means to securing a good job, a form of vocational training; higher education is no longer seen as something valuable in its own right (Shore and Taitz 2012; Wright 2014). KEOs' collaboration with business has led to an understanding that education should be for business: KEOs often use terms such as "enterprise" and "meeting the needs of industry" (Lynskey 2013). KEOs are seen as service providers and students as customers, with KEO education providing useful, practical skills that the economy needs (Boulton and Lucas 2011). Such an approach echoes claims in the research findings that KEOs are run as big businesses.

Some researchers see the introduction of knowledge exchange as part of the shift to KEOs becoming more like big businesses (Kezar 2004); other scholars believe that KEOs have become hybrid organisations (Thornton 2009) as they have been forced to adopt business-like structures, management and processes (Henkel 2007). The widespread use of business practices and language such as strategic planning and marketing confirm that KEOs are big businesses; success is judged in terms of research income and student numbers (Kezar 2004; Parker 2011; Shore and Taitz 2012; Kleinman and Osley-Thomas 2014). This approach to management in KEOs includes a drive for efficiency and effectiveness that responds to government pressure for monitoring, reporting and accountability (Kezar 2004; Parker 2011). The research findings illustrate how Vice-Chancellors are called Chief Executive Officers (CEOs), their governing bodies have become more like corporate boards and senior management teams are called Executive Boards; power is centralised with plans and targets (Parker 2011). Such moves reflect efforts to create a business-like or entrepreneurial

culture; it can be difficult to work out what KEOs are and who "owns"' them (Shore and Taitz 2012).

Although KEO management see themselves as part of leading, major (international) businesses, academics see themselves as part of an organisation which works for the public good in teaching, research and outreach (Shore and Taitz 2012). Some scholars believe that KEOs behave and operate differently to business (Kelly 2008); their organisational ethos and structure are quite different; academic freedom is still important (Tierney 2001). Pressures on KEOs to make money conflicts with their role as a public good and promoting free open sharing of research and knowledge (Thornton 2009). Academics see KEOs as places for sustaining a balance between commercial values and academic values, public or social good, and knowledge and education (Giroux 2002).

These changes in KEOs can also be viewed through the lenses of institutional theory and institutional logic (Vilkas and Katiliute 2014); the "corporatisation" of KEOs and their evolution into "businesses" can be understood as market logic (or academic capitalism) tending to prevail over academic logic (Canhilal and Lepori 2014; Geschwind and Karlsson 2014; Vilkas and Katiliute 2014). An entrepreneurial KEO is seen as linking ivory towers to the real world by using a KEO's research and knowledge for social and economic purposes (Redford and Fayolle 2014). The emergence of knowledge exchange has accompanied the move towards developing a more business-like culture, and both have potential implications for KEOs' roles of research and teaching.

Opinions are divided between those who see knowledge exchange as a threat to KEOs' traditional roles of research and teaching for the public good (Kezar 2004). Some scholars welcome the changes, and see KEOs as another kind of organisation which contribute to economic growth; public funding should be provided on this basis (Horowitz Gassol 2007). Many researchers have assumed that the move to entrepreneurial KEOs is part of a historic trend and is almost inevitable (Lam 2010). The changes in KEOs have brought conflicting interests, with academics having to balance different values and expectations in making decisions, and resulting ethical tensions (Ehrich et al. 2011).

One facet of KEOs' business is the research they undertake and the research income for which they compete (Kok et al. 2010). Although some scholars writers believe that KEOs have moved from undertaking pure ("Mode 1") research to conducting applied ("Mode 2") research (Dan 2013), the evidence is ambiguous (Van Looy et al. 2004); it is not clear how significant these changes are, their extent or the degree to which they have affected KEOs (Scott 2003). The research findings show that the boundaries between pure and applied research could be blurred in two ways; there is feedback between pure and applied research (Scott 2003; Slaughter et al. 2004), and there is an iterative process between knowledge exchange and research. In the research findings, knowledge exchange practitioners talk about "pure" and "applied" research rather than "Mode 1" and "Mode 2" research which the literature discusses. Some academics are unconcerned about the distinction between pure and applied research as long as they have challenging issues to explore and are indifferent about who funds it (Slaughter et al. 2004).

6.2.3   KEOs and the community

The research findings (Section 4.2.1, pp.69-71) confirm the literature about how KEOs play a significant role in their community or region. KEOs are embedded in their regions and communities (Howells et al. 2012); they have historic connections with their region and help to shape local and regional identity (Kitson et al. 2009; Lawson 2014). Questioning of public support has led many KEOs to consider how they can demonstrate their relevance and usefulness locally (Kelly 2008). KEOs contribute to regional economic growth through a range of activities including research collaboration, licensing and technology transfer and cultural development (Howells et al. 2012). This is part of KEO's expanding social and economic development remit, to show how they are relevant to and can support their communities (Chatterton 2000; Bond and Paterson 2005).

Knowledge exchange practitioners understand that KEOs feel that they have a social responsibility to support local business and economic development. Many KEOs were established to meet local business and economic needs and many of them originally provided vocational training (Watermeyer 2011). KEOs contribute to the development of local business in several ways: they provide a space where

local businesses can meet, network, collaborate and share ideas, access expertise and facilities, and help to develop relationships between business, and local public and third sector organisations (Kitson et al. 2009; Breznitz and Feldman 2012). KEOs support local regeneration; they can attract Government funding, and other investment and resources to their region (Howard 2011; Breznitz and Feldman 2012; Trippl et al. 2012; Dan 2013).

The research findings confirm the literature by showing how KEOs play an important and leading role in their communities and how KEOs contribute to their regions in several ways: as large employers, bringing in monies by attracting international students (Bond and Paterson 2005; Kelly 2008), contributing to and providing cultural activities, and sharing sports and cultural facilities with local residents; their staff and students live and work locally (Kitson et al. 2009; Ward and Hazelkorn 2012; Lawson 2014).

Perceptions of KEOs are mixed. The research findings (Section 4.2.2, pp.72-76) indicate that knowledge exchange practitioners feel that the public do not understand what academics do and believe that all KEO research is utilitarian. Stereotypes linger, of academics as boffins and KEOs remote from their communities, undertaking irrelevant research (Chatterton 2000; Rinne and Koivula 2005). Although this is changing, KEOs' use of jargon and "technical" language can create barriers (Chatterton 2000). Some academics are still seen as reluctant to demonstrate the relevance of their research and teaching (Bond and Paterson 2005). KEOs are seen as honest brokers, as trusted impartial intermediaries: they provide space, and freedom to express and criticise different viewpoints (Peters 2002). KEOs provide a neutral public space which is linked to KEOs' roles as central hubs in their communities. The idea of KEOs and academics as honest brokers (Kitson et al. 2009) means policy and decision makers, and the Government asking KEOs and academics to share their ideas, knowledge and expertise (Andereggen et al. 2012). The interaction of KEOs with policy and decision makers is an example of how KEOs engage with external organisations, including the Government and business, and this is explored in Section 6.4.

The different roles of KEOs show how they have evolved to reflect changes in society and changing expectations, focusing on and balancing different aspects of their roles (Sánchez-Barrioluengo 2014). KEOs have different ranges and diverse profiles of research, teaching and third stream activities, depending on whether they focus on education, research, or their community; some KEOs may focus on or more, or a combination of these functions (Rossi and Rosli 2014). The different roles of KEOs influence the breadth of and motivations for knowledge exchange and these are the focus of the next section.

6.3   Scope and rationale of knowledge exchange

This section explores the dimensions of knowledge exchange, a motif which emerged from the research findings rather than the Literature Review (Chapter 2), as illustrated in Figure 6.2. The dimensions of knowledge exchange comprise three elements: scope of, rationale or drivers, and benefits (impact) of knowledge exchange), and these are the focus of this section.
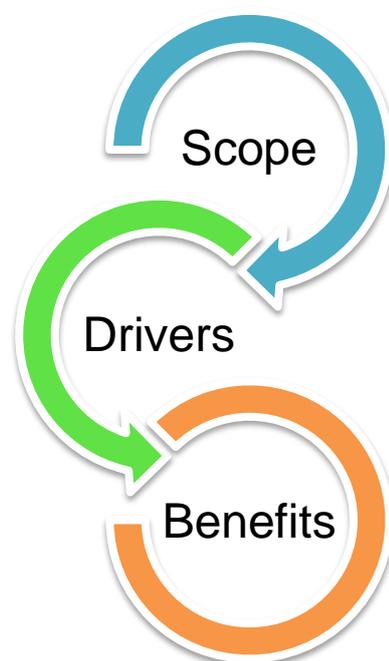
Figure 6.2 Dimensions of knowledge exchange

6.3.1 The scope of knowledge exchange

In trying to define the parameters of knowledge exchange, scholars attempt to find approaches to understanding it as a phenomenon. One approach is to

identify and categorise the activities which are involved. Scholars have classified knowledge exchange activities according to their common features, such as the nature of the activity, such as problem-solving, people-based (Abreu 2009; PACEC and the Centre for Business Research 2009b). The scope of knowledge exchange can be viewed from a different perspective. As Figure 4.4 (Section 4.3.1, p.82) shows, the range of knowledge exchange activities extends from public and community engagement to technology transfer, or from student graduate projects to hard end consultancy. The nature or type of the intellectual property involved determines whether an activity comes within or is categorised as knowledge exchange, knowledge transfer or technology transfer. Activities that involve tacit or softer intellectual property are classified as knowledge exchange; exploiting codified or registered intellectual property, such as patents through licensing and spinouts, is categorised as technology transfer. So knowledge exchange forms a continuum of activities along a spectrum which starts with tacit or "soft" and graduates and moves to "hard" or codified intellectual property. Knowledge exchange activities can be categorised according to the nature, degree of softness or hardness of the intellectual property involved.

This approach to understanding the scope of knowledge exchange partly echoes the model which Abreu and Grinevich (2012) have developed. Here knowledge exchange activities are classified according to the kind of knowledge on which they are based and whether or not intellectual property is protected. This is reflected in Table 6.1.

Knowledge exchange activity category	Activities	Intellectual Property protection	Gains/Benefits for KEO
Formal commercial activities	Licensing Spinouts	Usually appropriate	Profit/surplus
Informal commercial activities	Consultancy Contract research	Less appropriate and harder to secure	Profit/surplus
Non-commercial activities	Informal advice Public lectures	Not appropriate, inappropriate or not possible	Reputation, prestige, influence research funding, student recruitment access to equipment

Table 6.1 Knowledge exchange activities classified according to use of different IP protection method Adapted from Figure 1 (Abreu and Grinevich 2012, p.5)

KEOs and the Government tend to give higher priority to exploiting codified knowledge through patents, licensing, spinout companies and contract research, even though they do not generate significant financial returns for KEOs or much regional impact. Codified knowledge in the form of patents and publications is more readily exchanged. Exchange of tacit knowledge needs more effort, more personal interactions and makes knowledge exchange more costly (Bercovitz and Feldman 2006; PACEC and the Centre for Business Research 2009a). Although Abreu and Grinevich (2012) propose a more complex conceptual framework, Figure 4.4 (Section 4.3.1, p.82) offers a more immediate way of understanding the scope of knowledge exchange by moving along the spectrum or range of knowledge exchange activities, and seeing how they connect with different kinds of intellectual property and knowledge.

6.3.2 Knowledge exchange as a process

As well as classifying knowledge exchange activities, knowledge exchange can also be understood other ways as Figure 6.3 shows.
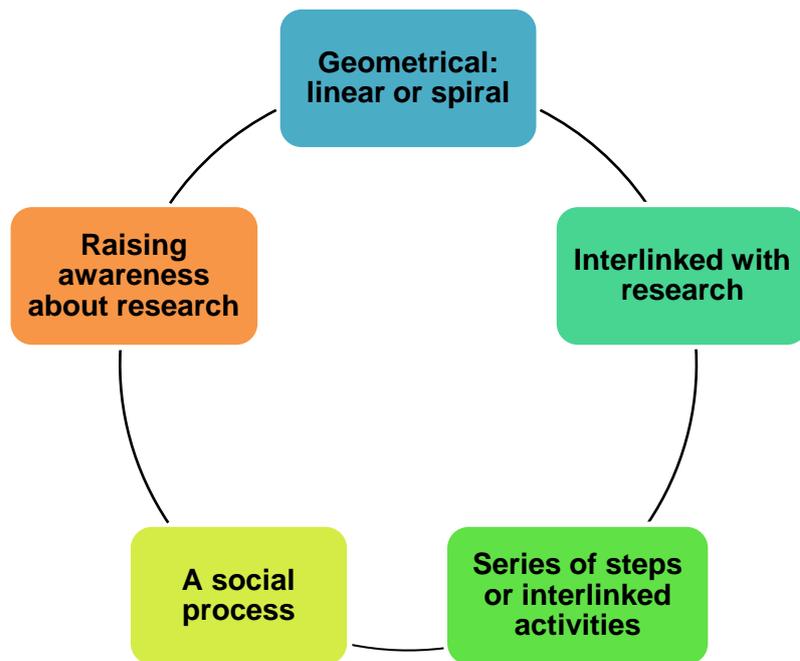
Figure 6.3 Ways of understanding knowledge exchange

Figure 6.3 shows how knowledge exchange can be perceived in five other ways as geometrical, as interlinked with research, as a series of steps or interlinked activities, as a social process, and as raising awareness about research.

Using geometry as a metaphor to understand knowledge exchange involves using two different shapes: linear and as a spiral. In the literature, linear approaches to knowledge exchange share common features: finding a problem or issue that needs solving, undertaking the research, adapting particular research results, encouraging use of the knowledge, monitoring its use and assessing the impact (Graham et al. 2006). This model is common in STEM and the research findings echo this to some extent by seeing knowledge exchange as a pipeline of knowledge where research moves from KEOs and academics to the market, and to research users (Ulhoi et al. 2012).

Seeing knowledge exchange as a linear process does not always reflect the complexity and mix of formal and informal interactions and relationships between KEOs and business (Bercovitz and Feldman 2006). The focus on technology transfer in STEM overlooks different kinds of knowledge exchange in other disciplines which are just as significant (Hughes and Kitson 2012). Some scholars offer an alternative to linear approaches and models of knowledge

exchange. Fewer studies have considered knowledge exchange activities in arts, humanities and social sciences (Hughes and Kitson 2012; Abreu and Grinevich 2014). These different understandings of knowledge exchange involve multiple pathways and complex connections that link academics and research users in different networks (Harrington and Kearney 2011). Models of knowledge exchange need to recognise the complexity and many aspects of knowledge exchange (Davies et al. 2008). In the research findings, knowledge exchange in social sciences and the humanities is seen as a spiral. According to the data, knowledge exchange in social sciences, arts and humanities is about influencing policy, and public and political debate about issues rather than creating new products and services as in STEM. There are indications that knowledge exchange has changed from a focus on technology transfer and a linear approach which was prevalent in the early 2000s. The model of knowledge exchange is now more about innovation, productivity, quality of life, cultural and creativity, and regenerating communities (Lockett et al. 2015).

Knowledge exchange can also be seen as a social process. Knowledge exchange is part of the research cycle where research users can contribute to shaping research questions; this is particularly true for social scientists. Research is an evolution rather than a linear process and knowledge exchange provides a feedback loop as part of an iterative process. The aim is to ensure that the knowledge generated from the research is relevant and can be used (Visram et al. 2014). Different research users can be involved at different stages of the process (Graham et al. 2006), and contribute their ideas about what is important and so influence the information and knowledge which they receive (Shaxon et al. 2012). This can involve adapting particular research results and outputs to meet particular needs, and implies consultation with research users to identify possible application(s). Academics can tailor the messages from the results of their research for different audiences and present them in different ways and formats (Shaxon et al. 2012).

These models shed an interesting light on the research findings by identifying elements of the knowledge exchange process (Shaxon et al. 2012). Other research confirms that knowledge exchange is multi-faceted and complex (Abreu

and Grinevich 2012; Perkmann et al. 2013). There is increasing recognition that knowledge exchange is carried out in different ways depending on the kind and form of the knowledge, with codified knowledge needing more formal mechanisms and tacit knowledge requiring more personal interactions. Exploiting codified knowledge is only a small part of knowledge exchange; there are many more informal channels or mechanisms or ways of undertaking knowledge exchange (Perkmann and West 2012). The pressure on KEOs to exploit their knowledge can be a reason for undertaking knowledge exchange and these kinds of drivers are the focus of the next section.

6.3.3   Knowledge exchange drivers

According to the research findings, Government policy is the main driver or reason for KEOs undertaking knowledge exchange: the Government encourages KEOs to contribute to economic growth and to generate income. The literature emphasises that KEOs' role in contributing to economic growth was one of the main reasons for the emergence of knowledge exchange (Fazackerley et al. 2009; Benneworth and Jongbloed 2010). The Government believes that the UK's economic success depends on its ability to create develop new goods and services from the research that KEOs undertake (Decter 2009), that there is a direct relationship between the research which KEOs undertake and economic growth (Boulton and Lucas 2011; Lynskey 2013; van Rooij 2014). The Government uses financial incentives to ensure that KEOs assume the roles which the Government wants them to play and create the results that expected of them (Boulton and Lucas 2011). The Government also uses KEOs to attract large companies to invest in research and development, and manufacturing in the UK. The economic crisis of 2008 and the resulting economic recession have influenced expectations about KEOs' capacity and capability to contribute to economic recovery and to resolving global technology and environmental challenges (Munck et al. 2014). On the other hand, the idea that KEOs should contribute to the economy is not new, and has not damaged research and teaching. Collaboration between KEOs and business is long standing and provides opportunities for solving problems and technological development (Larsen 2011).

Generating income is a driver for knowledge exchange, both in the research findings (Section 4.3.2, pp.90-91) and in the literature. The development of knowledge exchange has been prompted partly by KEOs' need to find additional funding as public funding declines and Government pressure on KEOs to secure more financial returns by exploiting their research (Bercovitz and Feldman 2006; Abdul Razak et al. 2014; Lockett et al. 2015). The need to secure research funding has become a motivator for KEOs and influences the behaviour of KEO management (Boulton and Lucas 2011). Although the Government had assumed that exploiting KEOs' intellectual property would create new income from licensing and spinouts (Lockett et al. 2015), financial gains to KEOs from these kinds of activities have been minimal compared with other forms of knowledge exchange (Howard 2011).

KEOs are uncertain about whether they undertake knowledge exchange for the public good or to generate additional income. Most authors tend to favour the former, citing the lack of significant financial return in US universities (Lambert 2003; Saraga 2007). This is offset by the growing debate about the "impact" of publicly funded research; knowledge exchange's economic impact is perceived as being for the broader good of UK plc rather than for KEOs' financial benefit (Lambert 2003; Saraga 2007). Some scholars feel that the Government should make an explicit statement about the purpose of knowledge exchange, that it is undertaken for its wider social and economic benefits rather than to generate income (Fazackerley et al. 2009). There is still some uncertainty about the extent to which KEOs have incorporated knowledge exchange into their central mission, whether KEOs undertake for knowledge exchange for its own sake. The rationale for knowledge exchange is also closely linked to one of the main benefits of knowledge exchange. As the research findings show, a benefit of knowledge exchange can also be a driver or reason for undertaking it and this is explored in the next section.

6.3.4   Knowledge exchange benefits – impact

Creating "impact" has emerged as the main requirement of Government funded research in KEOs. This is reflected in the need for academics to identify "possible pathways to impact" when they apply to the research councils for

research grant funding and when they finish research projects (Hughes and Kitson 2012.; Watermeyer 2012; Watermeyer 2014a; Farla and Simmonds 2015). "Impact" can be defined as making a difference or creating some kind of benefit. This means getting the results of research used in some way, applying and making sense of research so that research users can understand it. The Treasury's Green Book recognises that "impact" includes economic, cultural and social aspects (environmental, health, quality of life) and the research councils recognise this (Kelly 2008). However, funders such as RCUK and ESRC differentiate between different kinds of impact, such as academic, and economic and societal impact, or as instrumental (influencing a change in policy or in practice) and conceptual (helping to shift debate round an issue) (Economic and Social Research Council (ESRC) 2014), as the examples of definitions of different kinds of impact show.

> *"Academic impact The demonstrable contribution that excellent research makes to academic advances, across and within disciplines, including significant advances in understanding, methods, theory and application."* (Economic and Social Research Council (ESRC) 2014; Research Councils UK (RCUK) 2015)

> *"Economic and societal impacts The demonstrable contribution that excellent research makes to society and the economy. Economic and societal impacts embrace all the extremely diverse ways in which research-related knowledge and skills benefit individuals, organisations and nations by fostering global economic performance, and specifically the economic competitiveness of the United Kingdom, increasing the effectiveness of public services and policy, and enhancing quality of life, health and creative output."* (Economic and Social Research Council (ESRC) 2014; Research Councils UK (RCUK) 2015).

"Economic impact" tends to overshadow other kinds of impact, such as quality of life, and cultural development. Economic growth contributes to other kinds of social, cultural and environmental impact (Howard 2011; Bozeman et al. 2015). Trying to define impact raises questions of how to assess and evaluate it. Since 2010, the Government has been keen to use KEOs' external income as a measure of impact. Even KEO business collaborators find it difficult to assess

the monetary value of the KEO research they use (Lockett et al. 2015). There are several issues to resolve in assessing impact as Table 6.2 shows.

Challenges in assessing impact
Knowing where and when to look for impact
Determining who research users are
Estimating how long it takes for impact to happen, the time between undertaking and completing research and its impact
The kind of particular impact the research has had
Determining whether research is really the main factor and how to assess this
The difference the impact has made
Whether the impact is good or bad
How the impact is sustained

Table 6.2 Challenges in assessing impact of research (Developed from Graham et al (2006) and Bannister and Hardill (2013) (Graham et al. 2006; Bannister and Hardill 2013)

Table 6.2 highlights the inherent difficulties in measuring or evaluating impact. The least of these is being able to identify it, determining how, when, where impact occurs, and whom or what it has affected. Another significant element is the extent to which it can be asserted whether research or knowledge exchange is a main or significant contributory cause of the particular impact. There is also an assumption that impact is a force for good and tends to overlook the risk that the impact of particular research or knowledge exchange could turn out to be negative.

The increasing focus on impact, particularly in REF has revealed the lack of research and evidence on impact (Hughes and Kitson 2012; Cosh et al. 2014) and the need to develop other ways of assessing impact, beyond publication, spinouts, patents and licensing. Impact is also thought to be the same recognisable force in STEM and the social sciences. However the research findings show that impact can vary in different disciplines. Impact in STEM is more tangible and visible, such as a new product, service or process. In the social sciences, impact is harder to trace; it is more intangible and indirect: an academic can contribute to shifting debates and making people think about issues (Sánchez-Barrioluengo 2014); the measures are different (D'Este et al. 2013). Most measures of impact tend to be based on technology transfer and

exploiting codified intellectual property, such as patents, licensing, spinout companies and investment in research and development; impact metrics tend to underestimate the effects of other knowledge exchange activities, and in humanities, arts and social sciences (Kelly 2008; Hughes and Kitson 2012; Bannister and Hardill 2013).

Social scientists have found it difficult to assess and demonstrate impact on policy making. The range of knowledge exchange activities that academics are involved in shows the many potential pathways to impact, and the minor role of technology transfer in this (Hughes and Kitson 2012). Stronger approaches and more analytical methodologies are needed to evaluate knowledge exchange impacts (Kelly 2008).

The relationship between knowledge exchange and impact is blurred; it is not always clear whether they were separate or synonymous. The common theme is that knowledge exchange is a means to, a way to achieve impact. Knowledge exchange can be seen as a means of translating research results for an external organisation; impact is the output or way of interpreting an outcome; it is longer term. Knowledge exchange is a means by which investment in research can be translated into policies and activities that benefit society, and can ultimately generate more tax revenues for the Government (Hughes and Kitson 2012). Impact can be considered as an outcome of KEOs engaging with the external world, of knowledge exchange (Jacobs 2013).

Impact can also be seen as KEOs and academics assuming responsibility for how they use Government funding, giving something back by promoting their discipline and applying it to the outside world. The introduction of impact by the Government and funders such as HEFCE and the research councils has led to a change in culture in KEOs (Pettigrew 2011). Establishing impact as a key measure of KEO and academic "success" is interpreted as part of the growing influence of academic capitalism, treating knowledge as a commodity and weakening the traditional role of KEOs, with an increasing emphasis on their delivering knowledge, as providers of knowledge services (Watermeyer 2012; Watermeyer 2014a). In other words, "impact" is an element of or reflects the trends that are prevalent in the changing roles of KEOs, such as changes in how

knowledge is produced and moves towards more applied research (Pettigrew 2011).

The literature confirms the pressure on KEOs and academics to justify the money put into research and show the return on public investment, demonstrating the difference research makes, the benefits it brings (Horowitz Gassol 2007; Kitagawa and Lightowler 2013). KEOs and academics are being asked to recognise that there is an implicit contract with the taxpayer who funds their research. In exchange for public support, KEOs and academics are invited to engage with the outside world, to inform people about their research and to show how their research could benefit society. Like the rest of the public sector, KEOs are subject to the pressure to show value for money, towards greater accountability and transparency, and to have their performance and achievements monitored and evaluated through REF (Bond and Paterson 2005; Watermeyer 2011; Bannister and Hardill 2013; Watermeyer 2014a), to maximise the social and economic benefits in return for public investment in them (Markman et al. 2008). Such an approach echoes the discussion in Section 2.5.4 (pp.37-38) where the idea of a social contract between KEOs and society is explored. The concept of impact reinforces this understanding of the relationship between KEOs and society (Bannister and Hardill 2013; Lockett et al. 2015). *"As publicly funded researchers, we clearly have a responsibility to contribute something in return to society – in other words, there is some form of a social contract that we are obliged to honour. As part of this, there is an obvious need for public accountability."* (Martin 2011, p.247). The relationship between knowledge exchange and impact focuses on the outcome or difference that KEOs undertaking knowledge exchange can make. The next section explores how KEOs' approach engaging with the external world, first by looking at their relationships with their stakeholders and how they decide with which organisations to collaborate.

6.4   Engagement

This section explores how KEOs relate to the outside world. It first considers how KEOs engage with stakeholders, and then how KEOs decide to work with

business as a particular stakeholder, and organisations in different sectors, where ethical issues can arise.

6.4.1 Stakeholders

The concept of stakeholders emerges out of the discussion of the literature on CSR in Section 2.4.5 (pp.34-35). Knowledge exchange practitioners have different views about defining stakeholders and their relevance for KEOs. Freeman, the originator of the term "stakeholder", uses the term in two ways: those groups who are vital to a KEO's success, and more widely, to mean any group that influences or is affected by a KEO (Bowie 2012; Fassin 2012). Although the term "stakeholder" is used widely including in KEOs, knowledge exchange practitioners confirm that it is not always clear to what or to whom the term is supposed to refer; consensus on an agreed definition has yet to be reached (Mainardes et al. 2011; Bowie 2012).

Although the theory of stakeholder management is well established in the literature, the research findings show that KEOs can find it difficult to manage relationships with their stakeholders. Reasons for the apparent lack of stakeholder management in KEOs or taking a haphazard approach to it can include challenges in managing stakeholders' different, and often conflicting, expectations, and working out how to best communicate with them (O'Riordan and Fairbrass 2008). Stakeholder management is a means for KEOs to be accountable by balancing the interests and concerns of different stakeholders (Fassin 2012; Jondle et al. 2014), and often by involving stakeholders in decision-making and governance (Greenwood 2007).

The literature is not clear about how KEOs are meant to manage different stakeholders or what criteria to use (Mainardes et al. 2012). Some scholars assume that the more relationships a KEO has with its stakeholders, the more it can manage them, the more responsible and accountable it is being to them (Greenwood 2007). Many organisations find stakeholder management expensive and complicated (Groves et al. 2011), and the research findings confirm that this seems to be true for KEOs. Little research has been done to explore the nature of relationships between KEOs and their stakeholders (Johansson 2008;

Mainardes et al. 2012). It is not clear whether these difficulties apply to other kinds of organisations as well as KEOs, which could imply a gap in stakeholder theory. Empirical research is needed to help organisations, including KEOs, to decide to which stakeholders they should be giving time and attention, when and how (Alves et al. 2010; Mainardes et al. 2012).

As KEOs have different roles, they can have different sets of stakeholders, and knowledge exchange practitioners disagree about whether KEO and knowledge exchange stakeholders are the same or overlap. In some instances, knowledge exchange stakeholders can be a subset of a KEO's stakeholders; some knowledge exchange stakeholders are relevant for other parts of the KEO. Particular stakeholders can have connections with different parts of a KEO (McAdam et al. 2012), such as schools, faculties, departments, different parts of professional and support services, and the knowledge exchange office. Although Jongbloed et al (2008)'s analysis of KEO stakeholders is exhaustive (Jongbloed et al. 2008), some of the categories, such as joint venture partners and financial intermediaries are inappropriate for KEOs in the UK. A stronger categorisation of KEO and knowledge exchange stakeholders emerges by combining what the research findings revealed in Table 4.6 (Section 4.4.1, p.101) with a simplified version of Jongbloed et al's analysis (Jongbloed et al. 2008), as Table 6.3 illustrates.

Stakeholder category	Constitutive groups, communities
Governing entities	Government and local authorities, governing board
Management	Vice-Chancellor; senior KEO management
Staff	Academics, administrative staff; schools, faculties, departments, professional services, support staff
Clients	Students, parents/spouses, student loan company/tuition, Student Loan Company, service partners, employers, field placement sites, business, key people the knowledge exchange office is engaging with, knowledge exchange clients/customers/companies that might exploit KEO research
Suppliers	Secondary education providers, alumni, other colleges and universities, insurance companies, utilities, contracted services
Competitors	Private and public providers of post-secondary education, potential: distance providers, new ventures substitutes, employer-sponsored training programmes
Funders/donors	HEFCE, research councils, Innovate UK, charity funders, such as Wellcome Trust, EU Commission, individuals (includes governors friends, parents, alumni, employees, industry)
Business	SMEs, large companies/multi-national corporates, LEPs, Chambers of Commerce
Community	Local authorities, including city councils, city/town/region, local community, residents, neighbours, school systems; social services; special interest groups
Government	BIS, other Government departments and sister organisations such as the Ministry of Defence (MOD), Home Office, devolved administrations, policy makers /policy bodies. Her Majesty's Revenue and Customs (HMRC), Department for Work and Pensions, Intellectual Property Office, UK Trade & Investment
Other public sector	NHS, sector skills councils, charities and third sector
Non-governmental regulators	Foundations, institutional and programmatic accrediting bodies, professional associations
Knowledge exchange	Banks, fund managers, analysts, venture capitalists and angels, alliances and consortia

Table 6.3 Stakeholder categories and constitutive groups
(Source: Table 4.6 combined with Jongbloed et al (2008) (Jongbloed et al. 2008 Table 2, p.309)

Table 6.3 reinforces the research findings; that KEO and knowledge exchange stakeholders overlap. The most significant KEO stakeholder relationships are with academics, students, BIS, funders such as HEFCE and research councils, and business (Miller et al. 2014). Some stakeholders fulfil more than one function in their relationships with KEOs; for example, the research councils are both funders and knowledge exchange practitioners. As a stakeholder, the

Government through BIS plays a prominent role and, together with pressures from other external stakeholders, has influenced the changing role of KEOs (Hatier 2014). With the Government providing funding to support knowledge exchange, it has increased its prominence as a KEO and as a knowledge exchange stakeholder; Government has power, legitimacy and urgency (Miller et al. 2014). The emphasis on accountability and reporting to stakeholders such as the Government and funders, such as HEFCE and the research councils, may mean that KEOs can tend to give them higher priority than other stakeholders.

6.4.2   Collaborating with business

Some studies look at the motivations of business for collaborating with KEOs and some research has been done on academics' involvement in knowledge exchange (D'Este 2011; Abreu and Grinevich 2012). Little, if any, research has been undertaken on how KEOs approach collaborating with business, on how they decide with whom to work. Few KEOs have clear and consistent policies on collaborating with business (Howard 2011). KEOs have a range of approaches and policies in how they decide whether to collaborate with other organisations and business. KEOs have few, if any, clear strategies, policies, approaches and criteria which they use in deciding with which organisations and business sectors to work. Research on interactions and relationships between KEOs and business have tended to focus on technology transfer, such as creating spinouts, licensing and patents. However, KEOs interact and have relationships with a wide range of external organisations as well as business, and some researchers have been trying to explore and capture these, as well as the rationale and motivation for them (Olmos Peñuela et al. 2011).

The examples used in the research findings (Section 4.5, pp.107-115) showed how KEOs approach working with two "controversial sectors" of tobacco and defence. The research findings illustrate how some KEOs have considered possible issues that can arise; they have deliberated on and developed policies about which kind of businesses and sectors with whom they are happy to collaborate. Figure 6.4 builds on Table 4.9 (Comparing KEOs' approaches to working with tobacco and defence sectors, p.114) and summarises the main

constraints which KEOs set for themselves in deciding with which organisations and business sectors to collaborate.
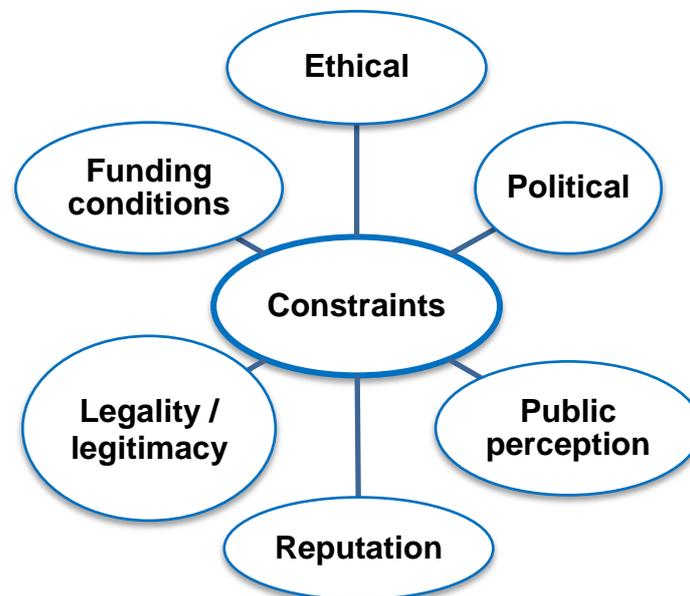
Figure 6.4 Boundaries within which KEOs operate in deciding whether to collaborate with business

Some of the constraints in Figure 6.4 overlap; for example, some KEOs do not want to work with tobacco companies because they believe that it would be inconsistent with their organisational values to do so; at the same time KEOs want to avoid creating a public perception or gaining a reputation that they are willing to undertake research that could potentially harm or kill others, or the end use of which could be illegitimate; for example, undertaking research that could be seen to promote gambling. Another KEO may decide that political factors and legality may be more be significant influences in their decision-making; for example, if a Government department or KEO funder is happy to work with a particular kind of organisation or sector, a KEO may decide that it would be appropriate to do so as well. Some KEOs may question whether it is illegitimate to work with particular sectors; for example, smoking is still not prohibited by law and tobacco companies contribute towards taxation. On the hand, the research findings show that some KEOs feel that terms and conditions which other grant funders offer may override this; for example, health research funders may require KEOs to agree not to collaborate with tobacco funders. However, there is little

literature on the role of the respective KEO and knowledge exchange actors involved in making decisions about which organisations to collaborate with, particularly where potentially contentious issues can arise, and the strategies and criteria they use in doing so. Therefore the current research has addressed a gap in the approach KEOs take in deciding with whom to collaborate.

6.5 Conclusion

This Chapter has explored the first three features of Responsible Knowledge Exchange as shown in Figure 6.1 (p.176): roles and perceptions of KEOs, scope and rationale of knowledge exchange, and engagement, how KEO engage with the outside world, in the light of the literature, and evaluated their implications.

Although KEOs are complex organisations which have multiple objectives, KEOs have four main roles: as big academic businesses, undertaking research and teaching and contributing to their communities. While the introduction of business practices and language into KEOs is discussed in the literature, KEOs are seen as public sector organisations. KEOs' collaboration with business has led to a new understanding that the purpose of KEO education is to train future employees, for the workforce; KEOs are seen as service providers and students as customers, and are run like large, academic-led businesses. The emergence of knowledge exchange has accompanied the move towards developing a more business-like culture, and both have potential implications for KEOs' roles of research and teaching. KEOs play an important and leading role in their communities and KEOs contribute to their regions in several ways: as large employers, bringing in monies by attracting international students, contributing to and providing cultural activities, and sharing sports and cultural facilities with local residents. KEOs are seen as honest brokers, independent and impartial, as trusted intermediaries who provide a neutral public space which is linked to KEOs' role as a central hub in their community.

Although scholars have classified knowledge exchange activities according to their common features, knowledge exchange can be understood as a spectrum of activities depending on the nature, degree of softness or hardness of the intellectual property. Activities that involve tacit intellectual property can be

classified as knowledge exchange, while exploiting codified intellectual property such as patents through licensing and spinouts is classified as technology transfer. So knowledge exchange and technology transfer activities can be matched with the degree of "softness" or firmness" of the intellectual property that is being used. This provides an alternative way of understanding the scope and range of knowledge exchange activities.

Understanding knowledge exchange as a linear process does not always reflect the complexity and mix of formal and informal interactions and relationships between KEOs and business. Knowledge exchange can be perceived in five other ways: as geometrical (linear or spiral), as interlinked with research, as a series of steps or interlinked activities, as a social process, and as raising awareness about research. These different understandings of knowledge exchange involve multiple pathways and complex connections that link academics and research users in different networks. In the research findings knowledge exchange in social sciences and the humanities is seen as a spiral. Knowledge exchange can also be seen as a social process. Knowledge exchange is part of the research cycle where research users who could contribute to shaping research questions. Research is an evolution rather than a linear process and knowledge exchange provides a feedback loop as part of an iterative process.

The main drivers or reasons why KEOs undertake knowledge exchange: Government policy to encourage KEOs to contribute to economic growth and to generate income. Creating "impact" has emerged as the main requirement of Government funded research in KEOs. Impact can be seen as KEOs and academics assuming responsibility for how they use Government funding, giving something back by promoting their discipline and applying it to the outside world. KEOs and academics are being asked to recognise that there is an implicit contract with the taxpayer who funded their research.

"Impact" can be defined as making a difference or creating some kind of benefit. This means getting the results of research used in some way, applying and making sense of research so that research users can understand it. With the increasing focus on impact, particularly in REF, the research findings show that

knowledge exchange practitioners understand that impact in STEM and the social sciences differ. In the social sciences, impact is harder to trace and more intangible and indirect than in STEM. As a social scientist, an academic can contribute to shifting debates and making people think about issues (Bannister and Hardill 2013).

The relationship between knowledge exchange and impact is not always clear, whether they are separate or synonymous. Knowledge exchange can be seen as a means to achieving impact, a way of translating research results for an external organisation; impact is the output or way of interpreting an outcome; it is longer term. Impact can be considered as outcome of knowledge exchange, of KEOs' engagement with the external world.

Although the literature has expounded theory of stakeholder management substantively, the research findings showed that KEOs can find it difficult to manage relationships with their stakeholders. It is not certain whether the difficulties KEOs encounter in applying stakeholder theory is unique to them, or whether other kinds of organisations face similar challenges. If there is a gap in stakeholder theory, research is needed to help organisations, such as KEOs, to decide how manage their stakeholders. KEOs have few, if any, clear strategies, policies, approaches and criteria which they use in deciding with which organisations and business sectors to work. Contentious issues can arise when decisions are made about which and with what kind of organisations KEOs can collaborate.

In the next chapter, the discussion moves on to consider the remaining features of Responsible Knowledge Exchange: the practice and relevance of CSR in KEOs, the emergence of KEO ethos and how knowledge exchange, CSR, values and ethics come together in Responsible Knowledge Exchange.

Chapter 7: Elements of Responsible Knowledge Exchange II

7.1 Introduction

This chapter continues to attempt to define the features of Responsible Knowledge Exchange, using the conceptual framework set out in Figure 1.2 (Section 1.3. p.10) as the starting point (Wolcott 1994, p.33). Figure 6.1 in Section 6.1 (p.176) summarises the main features of Responsible Knowledge Exchange and Chapter 6 explored the first three of these (roles and perceptions of KEOs scope and rationale of knowledge exchange, and engagement). Moving clockwise from the bottom of Figure 6.1, the discussion in this Chapter focuses on the fourth, fifth and sixth hexagons: KEO-CSR, knowledge exchange ethos, and knowledge exchange ethics and values.

7.2 KEO-CSR

This section explores the relevance of and practice of CSR in KEOs. Discussion of CSR in the Literature Review in Section 2.4 (pp.29-35) focused on defining, approaches to CSR and the relevance of CSR to KEOs. Here, approaches to CSR which emerged in the research findings are compared with an approach to CSR in KEOs taken in the literature; this leads to modified approach to KEOs and CSR, and a new model.

7.2.1   Approaches to KEO-CSR

The main reasons for KEOs to undertake CSR tend to be ethical, legal and regulatory, publicity and reputation, and fulfilling their social contract (Nadeem and Kakakhel 2012). In the Literature Review in Section 2.4.3 (pp.31-32), two models of CSR in KEOs are considered: Carroll's CSR pyramid (Carroll 1991) as modified by Lantos (Lantos 2002) which is shown in Table 2.2 (Section 2.4.3, p.32) and Esfijani et al's approach to USR (Esfijani et al. 2013). Esfijani at al's (2013) model incorporates some of the elements of CSR which the data revealed. The research findings reveal three aspects of CSR in knowledge exchange: links between CSR and ethics, CSR and the community, and implicit

mindset. Ethics is a common feature in Carroll's and Lantos' models, and in the data. The four domains in Carroll's CSR pyramid (economic, legal, ethical and philanthropic) (Carroll 1991) and Lantos' revised model (Lantos 2002) seem to reflect business's role and responsibilities rather than those of KEOs. Esfijani et al's (2013) alternative approach of USR (Esfijani et al. 2013) seems to be a better fit and includes KEOs' different roles, such as teaching and research, which are explored in Section 6.2 (pp.176-182). Links between CSR, ethics and knowledge exchange are explored in Section 7.5.1.

7.2.2   KEO-CSR and community

Unlike Esfijani et al's model, knowledge exchange practitioners feel that CSR is part of KEO's involvement in the community and is interlinked with KEOs' role of having a community focus. The community dimension involves KEOs being a good neighbour, which others are happy to interact with, as they know KEOs have consistent and transparent values; KEOs are understood to have a social responsibility to the public (Watermeyer 2011). KEOs, which are largely financed with public funds, are required to be socially responsible and give something back to their communities (Breznitz and Feldman 2012). KEOs have a social or public good mission, and CSR provides a means for them to differentiate themselves from business, to show that they are not becoming like big businesses (Nadeem and Kakakhel 2012).

While Esfijani et al (2013)'s model reflects KEOs' roles of research and teaching, the research findings show that a framework for KEO-CSR has to take account of knowledge exchange, and the links between CSR and ethics (see Section 7.5.1). Knowledge exchange practitioners feel that KEOs have a significant moral and social responsibility to the community. This includes exploiting knowledge and technology for social good by ensuring that a KEO's knowledge is used for the best advantage of research users. Helping individuals or business make money by exploiting KEO research is a social good (Shore and McLauchlan 2012). Some KEOs are willing to support activities that do not bring them any financial return and to undertake projects that offer broader societal benefit. Some authors suggest that parts of knowledge exchange can be classified as a social mission, where KEOs provide services for free (Dan 2013). Many academics say

that they become involved in knowledge exchange to take ownership of the technology and exploit intellectual property for social benefit (Jain et al. 2009). Academics engage in knowledge exchange for other reasons, such as wanting to be socially responsible for how publicly funded research is used, using publicly funded research for social benefit (Kitagawa and Lightowler 2013). Knowledge exchange practitioners feel that CSR is implicit in what KEOs do, a fundamental part of their mission and values. Although there is not an explicit idea in KEOs that they have to do good for society, academics are aware of their social responsibility; the idea of the role of KEOs as a public good is implied rather than stated openly.

7.2.3   Elements of KEO-CSR

Esfijani et al (2013)'s understanding of USR (Section 2.4.4 pp.32-34) incorporates the link between CSR and ethics which is reflected in Carroll's CSR pyramid (Carroll 1979; Carroll 1991; Nalband and Al Kelabi 2014). USR can be defined as engagement between KEOs and their stakeholders through their roles of teaching, research and knowledge exchange. So USR can be seen as part of a KEO's ethical performance by managing its activities responsibly to improve social development (Esfijani et al. 2013).

In discussing USR, some scholars assert that KEOs should be ethical in their operations and activities, but do not define what "'ethical" means, what standard is to be applied or used (Esfijani et al. 2013). KEOs should seek to operate where and whenever the ethical, legal and economic domains in the three domain model of CSR overlap (Schwartz and Carroll 2003). The ethical dimension of USR should be automatically incorporated into research, teaching, community and public engagement, policies, processes and systems, respecting intellectual property, and knowledge exchange (Esfijani et al. 2013). CSR is about how KEOs integrate economic, social and environmental issues into their values, norms, culture, decision-making and activities in an open and accountable way (Nalband and Al Kelabi 2014). Esfijani et al's (2013) concept of USR is more all-embracing than the research findings reveal and includes different KEOs' roles such as research and teaching, which are explored in Section 6.2 (pp.176-182). KEO-CSR comprises nine elements and is based on a

reinterpretation of Esfijani et al (2013)'s elements of USR (Esfijani et al. 2013). When the elements of CSR which the research findings reveal are combined with elements of USR as defined by Esfijani et al (Esfijani et al. 2013), then a definition of KEO-CSR emerges. This is illustrated in Figure 7.1.
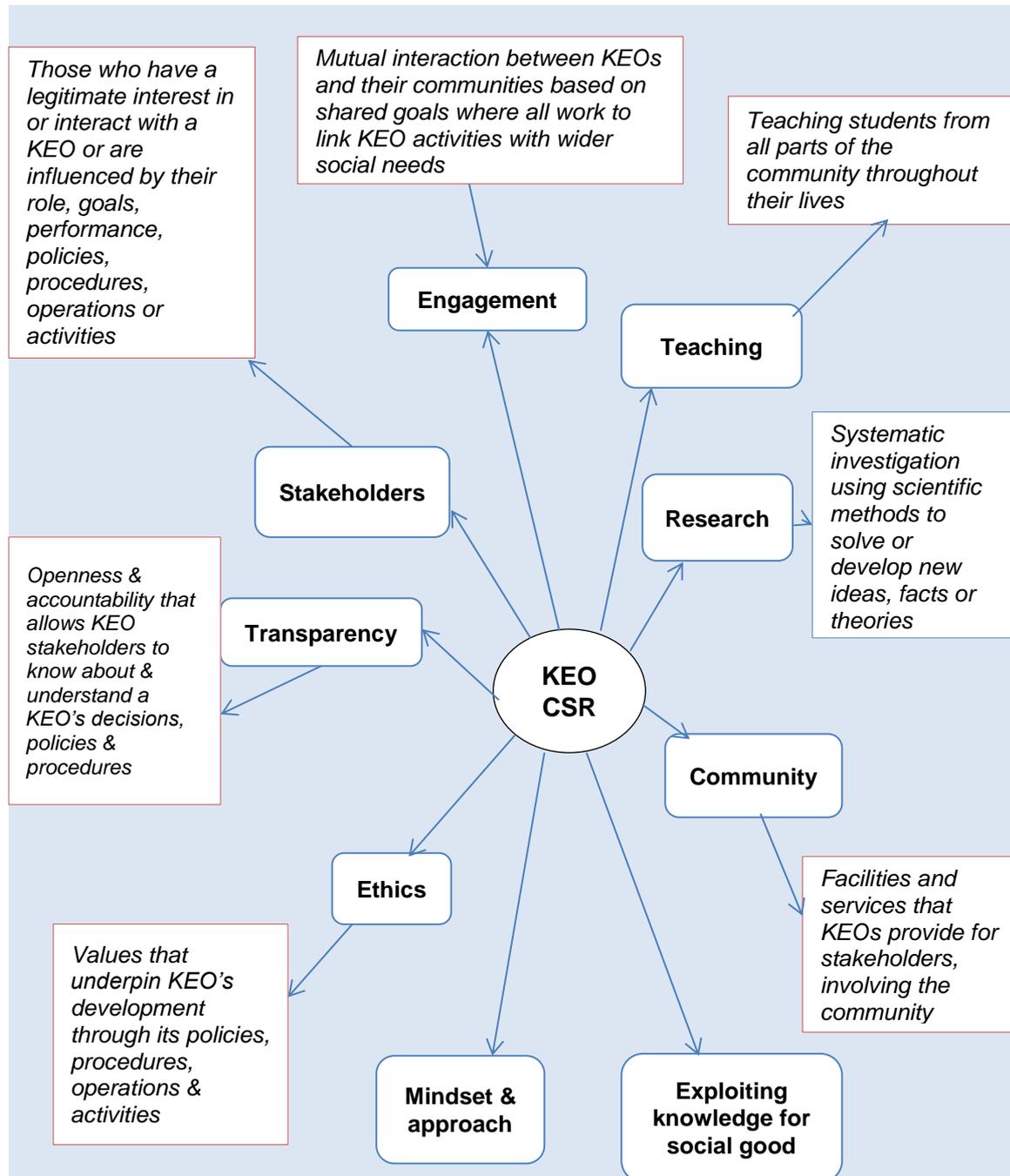
Figure 7.1 KEO Corporate Social Responsibility (CSR)
(Source: Findings of current research combined with Figure 3 USR Ontology
(Esfijani et al. 2013)

There are several differences between Esfijani et al's (2013) understanding of the elements of CSR (which were described in Section 2.4.4, pp.32-34) and KEO-CSR (Figure 7.1). Esfijani et al (2013) refer to "education" (Esfijani et al. 2013) and this is replaced with "teaching" in KEO-CSR. Esfijani et al (2013) mention "services" and this is replaced with "community" which offers a broader understanding in KEO-CSR. KEO-CSR in Figure 7.1 includes two additional elements: exploiting knowledge and technology for social good and mindset (or motivation). A revised interpretation and understanding of the main features of Esfijani et al (2013)'s understanding of USR helps to define some of the main elements of CSR in KEOs.

7.3   Knowledge exchange ethos

This section explores the fifth element of Responsible Knowledge Exchange, KEO ethos, which comprises academic values, knowledge exchange values, knowledge exchange guidance or reference points, and governance of knowledge exchange. In the Literature Review (Section 2.3.5, pp.27-28), academic values are considered as part of the role of KEOs. In the research findings, academic values and how they interact with knowledge exchange emerge as a more significant theme; their interconnection with KEO culture and ethical climate provide a starting point for exploring the ethics and underpinning values of knowledge exchange.

7.3.1   Academic values

As knowledge exchange has been incorporated into KEO's mission alongside research and teaching, academic values can offer insights into the values of knowledge exchange. The research findings show that knowledge exchange practitioners believe in the continued validity of Mertonian norms, albeit in a modified form; Mertonian norms come close to being a "philosophy of academia" (Knuuttila 2012), as ideals rather than what actually happens (descriptive) (Slaughter et al. 2004; Anderson et al. 2010; Lam 2010). Studies have shown that academics do not always practise Mertonian norms, and dislike others breaching them (Anderson et al. 2010). Despite this, Mertonian norms still have a strong influence. Academics can use Mertonian norms to justify a particular

approach to research, as shorthand to summarise academic ideals and norms, to help define their professional identity; academic values influence how academics teach and research, set standards for existing academics and indicate the kind of behaviour to which new academics should aspire (Brey 2004; Anderson et al. 2010; Lam 2010). Knowledge exchange practitioners describe how academics believe that there is something inherently right and truthful about being curiosity driven, about challenging accepted ways; this is reflected the literature. Academics undertake research because they are motivated by the creativity of it, like finding things out, and attempting to understand concepts and phenomena (Lam 2011).

Academic freedom or independence is seen to be an integral element of academic ethos. However, academic freedom or individual autonomy is accompanied by intellectual responsibility (Kayrooz et al. 2001; Gibbs 2013). Some scholars feel that knowledge exchange threatens academic values, particularly academic freedom (Akerlind and Kayrooz 2003). In some scholars' eyes, Mertonian ideals are conflicting with pressure to do research that is relevant, useful and practical (Parker 2011) and the emergence of knowledge exchange (Lieberwitz 2006).

Knowledge exchange practitioners feel that academics have to be open and truthful, to give an independent view. If they do not, they will lose their status, promotion, their networks, and their research outputs as no one will want to use them. Unless an academic tries to establish the truth, their credibility and their reputation suffer. Academics seek to sustain the quality and integrity of their research to ensure their professional standing and reputation among their peers and with funders (Bruhn et al. 2002). So perhaps it is not surprising that integrity and reputation emerge as the most highly rated academic values in the research findings with independence, public accountability, trust and transparency, and credibility following in the rear. Ensuring their reputation and integrity by developing their standing and credibility through their research and publishing is a significant academic aim. The research findings demonstrate how a modified version or set of Mertonian norms persists and are still relevant to academics and knowledge exchange practitioners. However, there is little in the literature about

reputation and integrity as academic values, or their relationship with Mertonian norms and academic freedom.

7.3.2   Knowledge exchange and academic values

The challenge that knowledge exchange can pose to academic values is a theme in the Literature Review (Section 2.3.5, pp.27-28) and in the research findings (Section 5.3.2, pp.136-142). Knowledge exchange practitioners see that academics are under severe pressure to publish, generate knowledge and ideas, and to engage more with outside world.

There are concerns about threats to academic standards and academic freedom as KEOs try to increase their external income by collaborating with business and other sectors. The scenarios which were explored in the data show how academic values of independence, objectivity, and autonomy underpin academics' and KEOs' decisions. There are some indications that some boundaries are becoming blurred, such as companies locating equipment on KEOs' premises and allowing academics to use them.

Academic success is measured by publications and knowledge exchange could inhibit free sharing of knowledge (Bruhn et al. 2002). Academics' freedom to choose what to research and teaching can be constrained by the funding they have available (Chipman 2000; Kayrooz et al. 2001). The move to KEOs having more financial self-determination could threaten academic freedom as new funding sources may influence their research choices and limit the kind of contracts they can accept, especially when they are competing with other KEOs (Henkel 2007; Tartari and Breschi 2012). Funders try to respect academic autonomy and independence, and at the same time to direct research so that it will meet the needs of business (Mendoza 2009; Shore and Taitz 2012).

Academics can recognise the need to collaborate with business, but also appreciate the limits on academic freedom, open knowledge and dissemination of research that knowledge exchange can imply (Bond and Paterson 2005). Knowledge exchange may conflict with traditional academic values to disseminate knowledge by creating conflicts of interest and commitment, and setting boundaries around confidentiality (Slaughter et al. 2004; Rinne and

Koivula 2005; Boardman and Ponomariov 2009; Sánchez-Barrioluengo 2014). Academics have expressed concerns that collaborating with business can involve constraints on publishing and, discussing their research, controlling research results, using intellectual property and create conflicts of interest (Kayrooz and Preston 2002; Davis et al. 2011); academics want to ensure that these are not too restrictive (Lieberwitz 2006; Lam 2010). Business may insist on delaying publication so that they can review research results for material which could patented or to protect the value of some of the research results (Van Looy et al. 2004; Bstieler et al. 2015). These kind of pressures can restrict academics sharing their knowledge, data and methods with colleagues (Mendoza 2009; Pavlidis 2012).

Business and academics often have different views about handling research results (Bruneel et al. 2010). Business see KEO research as a resource, and academics want to use and share research findings to win recognition from their peers (Bruneel et al. 2010). On the other hand, some academics do not see a business requirement for confidentiality as a concern; the kind of information they are asked not to disclose often relates to particular products and is not of much interest to other academics (Mendoza 2012).

Knowledge exchange practitioners consider that most academics will take an objective standpoint and will not be influenced by the fact that a company is paying for the work; this partly reflects the literature. Testing business products at KEOs provides independent credibility, especially when a product has been developed jointly (Ankrah et al. 2012). However, this can blur into endorsement, which can compromise academic independence; research results can be interpreted to reflect well on the funder (Kezar 2004).

The research findings confirm that some academics are willing to engage with knowledge exchange and impact, and to use their judgment to strike the right balance between knowledge exchange and research. Some writers argue that knowledge exchange brings more benefits than disadvantages for academics, their KEO, their careers and their students. There are new kinds of academics who undertake knowledge exchange and research (Szelényi and Bresonis 2014). As the research findings show (see Section 4.3.2, p.91), co-creating knowledge

can be a motivator for academics to engage in knowledge exchange. Academics can also be influenced by market developments, the needs of the society or the economy, and still undertake their research within a framework of academic freedom. Some academics can be comfortable engaging in knowledge exchange as they can publish their research and also patent it (Davis et al. 2011). These kind of academics believe that threats to academic values such as secrecy, proprietary intellectual property and restrictions on publication can be managed (Mendoza 2009). As the research findings show, constraints on publishing findings from collaborative research can be circumvented by removing confidential information, which are an insignificant part of the findings or apply to a particular product (Slaughter et al. 2004; Mendoza 2009).

Some academics do not see any conflict between publishing or sharing information and knowledge, and patenting; industry can legitimately not share information until a patent is proved (Slaughter et al. 2004). Academics who participate in knowledge exchange on this basis believe that they can sustain their academic freedom while giving funders early access to data and ideas; they know how to work round and live with these restrictions so that they can undertake their research as they want (Mendoza 2009). These kind of academics are used to and comfortable working with business, their research is inspired by practical needs, and business are important stakeholders (Mendoza 2012). Some academics who believe in academic values can see the benefits of engaging in knowledge exchange, and are adapting their research to meet business needs (Lam 2010). They are able to sustain and shape their roles and identities to incorporate collaborating with business without undermining their academic ethos. Academics can create an "entrepreneurial" identity that sits alongside their professional academic role, a hybrid identity (Jain et al. 2009; Lam 2011) that does not undermine their academic ethos (Henkel 2007). Knowledge exchange is an extension of their main research and fits with their professional identity (Lam 2011).

Knowledge exchange practitioners believe that academics are starting to see how knowledge exchange can benefit their research and their career in several ways. Knowledge exchange is a way for academics to gain recognition and raise

their research profile, credibility and reputation. Academics can learn about the needs of business and this can influence how they develop their future research and teaching. Collaborating with business can help academics ensure that their research is leading edge, help to get their research disseminated and applied in the outside world, and to find partners for future research (Bond and Paterson 2005; Visram et al. 2014). Knowledge exchange offers academics a range of opportunities and benefits; these include access to experience and expertise in developing products and commercialising them, placements for students and jobs for graduates, and feedback on research, as well as connections and networks, access to equipment, recognition and trust, opportunities for collaborative research (Kayrooz et al. 2001; Mendoza 2009; Perkmann et al. 2013). Academics, who are happy to undertake knowledge exchange, can use their business connections to gain additional funding for their research, and sometimes to supplement their personal income (Jain et al. 2009; Lam 2010; Ankrah et al. 2012).

Knowledge exchange's threat to academic values and academic freedom may not be as damaging as anticipated or believed. The idea that research excellence is incompatible with academics doing knowledge exchange seems to conflict with other research that shows a positive relationship between outstanding research and academic entrepreneurship (Lynskey 2013). Research into the effects of academics and KEOs collaborating with business has not provided clear evidence either way (Behrens and Gray 2001; Davis et al. 2011). Some research shows that collaborating with business does not damage an academic's research (Davis et al. 2011) or does not lead to delays in publication or lead to an increase in confidentiality (Tartari and Breschi 2012). Academics can collaborate with business, and retain their academic freedom, undertake research and publish, particularly where research which business funds, is some distance away from practical application (Mendoza 2009). More recent research is starting to explore the disadvantages of KEO-business collaborations, such as unethical behaviour (Bozeman et al. 2013). However, there have been few studies so far.

The values that KEOs adopt corporately can also influence how academics and knowledge exchange practitioners perceive ethical issues and ethical limits. These are explored in the next section.

7.3.3   KEO values

A KEO's culture can be understood in several ways: its implicit, internal values such as unwritten rules of behaviour, visible signs of dress, language, and rituals (Daumard 2001). Tierney's approach to reviewing KEO culture assumes that a KEO's processes and structure reflect its organisational culture, its values, beliefs, norms and assumptions (Tierney 1988; Kezar and Eckel 2002). Exploring a KEO's culture helps to show how it adapts to changes in behaviour and decision-making of academics, administrators, and KEO senior management (Silver 2003; Beytekin et al. 2010). As KEOs vary in their history, development, values and processes, so their cultures differ (Tierney 1988).

Research shows that organisations can have several cultures (Kezar and Eckel 2002; Plewa et al. 2005). KEOs are a mix of different cultures; there is not one common KEO culture (Silver 2003). Different subcultures arise in different parts of a KEO as individuals vary in how they respond to KEO systems and processes, and different management and stakeholders' expectations create different ethical norms (Grojean et al., 2004). KEOs are collections of groups, clusters or "tribes" based around disciplines, sub-disciplines and departments each with their own climates which define norms, standards, values, status rewards and expectations (Silver 2003; Mendoza 2009). Both disciplines and departments provide professional identity for academics; disciplines and departments are the main sources of culture in KEOs (Mendoza 2009). This is reflected in the research findings where KEO culture can be devolved; faculties tend to manage ethics and projects.

However, academic values have sometimes been confused with KEO culture (Silver 2003). A KEO's explicit values are set out in its mission and value statements which define expectations of behaviour and action in the organisation (Jondle et al. 2014). However, in the research findings, KEOs vary in whether they have a set of organisational values (Section 5.3.3, pp.142-144); KEOs can

use a code of conduct ethics, or ethics policy to replace a set of organisational values. Mertonian norms underpin academic culture; KEO culture seeks to sustain academic norms (Mendoza 2009).

In the research findings, values can be at the heart of how knowledge exchange practitioners perceive their KEOs; for others, organisational values are less important. Some KEOs link their values to their organisational vision and their strategy. Many KEOs have implicit organisational values which are unwritten; in part, these can be indicated in its rewards and incentives, hiring and promotion arrangements (Jondle et al. 2014). In the research findings, tacit values vary among KEOs; it depends on the size of the KEO and the degree of "corporateness". KEO leadership, mission, symbols and values are also important elements of KEO culture (Mendoza 2009).

Scholars disagree about the impact of changes in KEOs' roles and the emergence of knowledge exchange on KEO culture. Some scholars believe that core academic culture still predominates (Mendoza 2009). Other writers feel that KEO culture is being undermined with increasing competition, changing roles, responsibilities and expectations of KEOs and academics, and increased conflict and tension (Silver 2003). When a KEO's culture supports and values effective knowledge exchange, this may encourage academics to be more inclined to participate in knowledge exchange (Vadi and Haldma 2010). With all the changes in roles, responsibilities and expectations of KEOs, research into organisational culture in KEOs has more become more significant (Beytekin et al. 2010).

KEOs' approach to knowledge exchange ethics are aspirational as they can be linked to the kind of organisation that the KEO wanted to be; KEO values tend to reflect the KEO's position towards ethical issues in knowledge exchange. This does not quite fit with the literature where definitions of ethical climate tend to emphasise a KEO's existing values and norms, and understanding of what is right and wrong, acceptable and unacceptable behaviour, rather than aspirational intentions. Each KEO determines its own priorities about "right "wrong", ethical and unethical (Grojean et al. 2004). Grojean et al (2004) citing Nicotera and Cushman (1992) argue that *"an action can be judged as ethical if it upholds*

the value system of that organization'' (Grojean et al. 2004, p.226). Much of academic ethical climate is tacit or implicit (Bruhn et al. 2002); ethical climates cannot be measured or evaluated easily or objectively (Behrens and Gray 2001). A KEO's structure, its history and size influence its ethical climate (Fritz et al. 1999; Malloy and Agarwal 2001). Even so, some KEOs have considered how they can provide guidance or reference points on issues that can arise in knowledge exchange and this is the focus of the next section.

7.3.4   Knowledge exchange "reference points"

Few KEOs have clear separate guidance or reference points on knowledge exchange issues, ethics, policies and processes in KEOs. Knowledge exchange practitioners are bound, like all staff, by the KEO's policies on ethics, research integrity, and conflicts of interest and the financial regulations; other KEOs have a conduct of conduct. Some KEOs do not have any explicit guidance on or for knowledge exchange; others have clear policies on intellectual policy and commercialisation. This apparent gap in KEOs' policies is not discussed in the literature.

Codes of ethics are supposed to provide an ethical framework; compliance with them is meant to encourage ethical behaviour (Hatier 2014). On the other hand, there is little in the literature about the use of codes of conduct and ethics in KEOs, although at least two attempts have been made in the UK to develop some since 2000 (Baines 2011). Codes of ethics or conduct in KEOs tend to focus on research ethics or teaching and seem to be intended to apply to those who undertake research (Jordan 2013). KEOs find it difficult to establish formal codes of ethics or avoid doing so due to potential conflicts between academic values and professional ethics (Kelley et al. 2005). Although academics may have professional codes of ethics, they tend to look to academic values for ethical guidance (Williams-Jones 2013). KEOs encounter challenges in ensuring that academics are aware of and comply with any ethics codes and requirements, such as self-policing, and lack of consensus on what is unethical conduct (Bruhn et al. 2002; Kelley and Chang 2007). Academics recognise the need for ethical standards, but they do not seem to be able to agree on what these should be (Bruhn et al. 2002).

This section has explored how KEO values and guidance on (or lack of reference points) on knowledge exchange issues contribute to organisational culture and the ethical climate in knowledge exchange. The next section considers how ethical concerns and ethical boundaries in knowledge exchange are set and managed.

7.4 Managing ethical concerns

The ethical boundaries which knowledge exchange practitioners feel are relevant to knowledge exchange and the ethical issues about which they are concerned are discussed in Section 5.5 (pp159-171). This section builds on this and on the research findings on the checks and balances which KEOs use in governing knowledge exchange (Section 5.4, pp.147-159). Knowledge exchange practitioners identify conflicts of interest as an ethical issue and this section considers how KEOs attempt to manage ethical issues by looking at conflicts of interest as an example. The section then goes on to consider how KEOs manage and govern ethical issues by looking at the role of ethics committees.

7.4.1 Managing conflicts of interest

KEOs vary in the approach they take to managing conflicts of interest. KEO management and others have tended to see conflicts of interest as a form of academic misconduct (Williams-Jones 2013). However, some scholars assert that conflicts of interest are not unethical or the same as academic misbehaviour, even though they may lead to unethical conduct (Williams-Jones 2013).

Conflicts of interest tend to occur when academics are trying to progress their careers, their department, their students and their KEO (Williams-Jones 2013). They also tend to arise where academics have financial or personal interests that could influence their official duties, either as teachers or in their research (Williams-Jones 2013). Academics and KEOs can acquire financial or reputational interests in the outcome of research. This may lead to a conflict of interest which affects the integrity and independence of their research (Blevins and Ewer 1988; Kezar 2004; Van Looy et al. 2004). If an academic has shares in a spinout or other company which supports their research, then this creates a conflict of interest (Ndonzuau et al. 2002; Ankrah et al. 2012). Some writers

argue that even apparent conflicts of interest can lead to the public losing trust in KEOs and academics (Resnik 2005; Lieberwitz 2006; Andereggen et al. 2012).

Managing conflicts of interest is difficult as academics see themselves as independent and do not always realise when they have a conflict of interest or see that there could be a problem. Academics tend to misunderstand what conflicts of interest are, when disclosure is needed and what has to be disclosed; they feel that disclosure policies are more constraining than they really are, and that academics can monitor their own conduct (Lipton et al. 2004). Academics tend to resist conflicts of interest policies and requirements to disclose them; they tend to see these kind of approaches as KEO management trying to intervene in what academics see as private affairs and their freedom to use their expertise (Campbell and Slaughter 1999). Knowledge exchange practitioners feel that managing conflicts of interest is about declaring an interest and being open about the potential conflict so that the KEO can decide how to minimise the potential for conflict. Some KEOs assume that academics will disclose any relationships; others have arrangements in place under which KEO staff have to declare any conflicts of interest, such as registers of interest which are updated annually.

KEO spinout companies are a particular area where conflicts of interest can occur; they can create conflicts for academics between their academic and their entrepreneurial roles (Ankrah et al. 2012). Knowledge exchange practitioners describe how KEOs are aware of potential risks and consequences of setting up spinout companies. A point can come where decisions, which an academic has to make as a director of a spinout, can conflict with the KEO's interest. An academic can become so closely involved with a spinout company based on their knowledge and expertise; they may become defensive about it, and the KEO has to stay alert to this. Academics can start to put the spinout first, ahead of their responsibility and commitment to the KEO, sometimes to the KEO's disadvantage. Academics involved in a spinout can be tempted to place most of the research with a KEO, often at cheaper rate (Ndonzuau et al. 2002). This can also happen the other way round: when an academic stays with the KEO and tries to charge a spinout less than full cost for research which the KEO undertakes for the company.

Most KEOs tend to have ongoing relationships with their spinouts and some KEOs have guidelines on how to manage the relationships (Ndonzuau et al. 2002). KEOs need to have clear policies and strategies for setting up and managing spinouts, and have appropriate business development skills and capabilities in knowledge exchange offices (Markman et al. 2008). A lack of clear policies and procedures in KEOs about establishing spinouts, inexperienced resources in knowledge exchange offices and a lack of incentives to attract external entrepreneurs to manage spinouts may have hindered the formation of spinouts (Lynskey 2013).

In the research findings (Section 5.4.2, pp.153-154), KEOs differ in whether they are comfortable for academics to be appointed as directors of companies. Some KEOs are wary about appointing academics as directors of companies as academics are not always clear about whether they are meant to act In the company's or the KEO's interest. Many academics do not appreciate what the responsibilities of being a director entail and the implications of these. Although the research findings indicate that KEOs differ in the extent to which academics are allowed to be involved in spinouts, there is little commentary in the literature about KEOs' policies on academics' involvement in these kinds of companies. However, the literature does have a little more to say about managing academic consultancy.

Academic consultancy can be understood as outside organisations commissioning academics to provide technical advice, sometimes on an ongoing basis, using their existing knowledge, knowhow and expertise (Haeussler and Colyvas 2011; Olmos Peñuela et al. 2011). It can lead to conflicts of commitment and of interest if an academic prioritises their client over their academic responsibilities (Wright et al. 2008; Perkmann and West 2012; Perkmann et al. 2013; Williams-Jones 2013). Knowledge exchange practitioners show that KEOs differ in how much time and freedom they give academics to undertake consultancy. Many KEOs have official policies or informal practices whereby academics can undertake outside consulting and often limit this to 20% of their time or one day a week of their time; many academics try to work round this.

Although many KEOs have policies on academic consultancy, they can be difficult to enforce (Goldfarb and Henrekson 2003).

Academic consulting is a more significant and valuable knowledge exchange activity than spinouts and patenting (Abreu and Grinevich 2012). Bond and Paterson's (2005) research indicate that almost a third of their respondents in England have been involved in consultancy and more than a quarter of their respondents in Scotland have done so (Bond and Paterson 2005). Academics can undertake consulting for several reasons: to commercialise their inventions, to supplement their income, to find opportunities and ideas for research and teaching, to apply their knowledge and expertise, and to share their tacit knowledge skills and ideas (Perkmann and Walsh 2008; Haeussler and Colyvas 2011).

Many KEOs feel that allowing academics to undertake consulting is a way to compensate for the lower salary they earn compared with the private sector, a way to retain valuable staff (Horowitz Gassol 2007). Some academics, particularly leading ones, can find ways to redefine their boundaries and identity, and undertake consultancy as a way to support these (Henkel 2007). Some scholars argue that academics value their relationships with business as they can use them to increase their independence, income and reputation (Campbell and Slaughter 1999).

Assessing the extent and impact of academic consulting is difficult. Some academics undertake consulting in their own right and deal directly with their client rather than go through the KEO. This could mean that the level of consulting activity is underestimated (Freitas et al. 2011). The literature seems to have two main gaps. Scholars do not seem to distinguish between consulting which academics undertake in their official capacity through their KEO, and consulting which academics undertake in their own time or within the time which the KEO allows them for this. The literature is ambivalent on how arrangements work when KEOs allow academics to undertake consulting in their working time, whether academics do so in an official capacity through the KEO or as a private arrangement between the academic and their client.

7.4.2   Ethics Committees

Ethics Committees would seem to be one mechanism which KEOs could use to manage issues, such as conflicts of interest, which can arise in knowledge exchange. However, in the research findings knowledge exchange practitioners feel that there is an apparent inconsistency in the role and scope of KEO ethics committees, which vary in the range of their responsibilities and their activities. There seems to be little literature looking at the role of ethics committees in KEOs in the UK, and what role, if any, they have in considering ethical issues that can arise in knowledge exchange; for example, managing conflicts of interest that may arise. What research has been done has tended to focus on KEOs in the US, rather than the UK.

KEOs have found it difficult to enforce ethical decision making and ethical behaviour (Kelley et al. 2005). Some authors feel that some ethics committees have become gatekeepers who see their task as to avoid litigation and controversy, and have become risk averse (Sikes and Piper 2010). Knowledge exchange practitioners feel that KEOs' ethics policies tend to apply to research and teaching only, and that they do not always seem to apply to knowledge exchange. Given the significance of knowledge exchange's role in KEOs, there could be a gap in ethics governance which the literature has yet to consider.

Having explored how knowledge exchange practitioners perceive KEOs manage a particular ethical concern, conflicts of interest, the next section turns to consider the connections between knowledge exchange, CSR and ethics and the elements of Responsible Knowledge Exchange.

7.5   Elements of Responsible Knowledge Exchange

This section attempts to explore the interconnections between knowledge exchange, CSR and ethics and to define the elements of Responsible Knowledge Exchange.

7.5.1 Links between knowledge exchange, CSR and ethics

As the discussion in Section 7.2.1 showed, connections between CSR and ethics can be supported. Like Esfijani et al (2013), knowledge exchange practitioners consider that CSR and ethics are interchangeable (Esfijani et al. 2013). In the research findings CSR issues are often seen as ethical issues, and CSR as ethics is described as being about academic values. In the research findings, CSR is also seen as inherent in KEOs' mission and roles, part of the academic mindset.

Esfijani et al (2013) assert that ethics should be interconnected and integral to a KEO's policies and processes (Esfijani et al. 2013). Esfijani et al (2013) also define ethics as a way or mechanism for KEOs to ensure their decision-making processes are appropriate (Esfijani et al. 2013). KEOs' relationships with their stakeholders should be based on ethical principles such as honesty, trust and integrity (Ehrich et al. 2005). The ethical dimension of KEO-CSR has several perspectives: doing good, values, public good and broader social responsibilities which are linked closely to KEOs' broader role and mission (Esfijani et al. 2013). KEOs understand CSR as ethical behaviour, transparent actions, complying with the law, caring for the environment and collaborating with stakeholders (O'Donohue and Nelson 2009; Sharma and Kiran 2012; Majichrzak-Lepczyk 2014).

Ethics are a way for KEOs to strengthen their operations and activities and (Sharma and Kiran 2012) and their decision making, as integral elements of their activities (Esfijani et al. 2013). Scholars who link CSR and ethics claim that KEOs should be socially responsible as it is the right thing to do (Jones 1999). CSR can be as a kind of ethical boundary of "doing no harm" (Groves et al. 2011). If a normative approach to CSR is taken, then KEOs have to take account of stakeholders' concerns and interests. CSR can be seen as a kind of exchange between KEOs and their stakeholders: a KEO offers a public service or social benefit and in return receives support and approval from their stakeholders. As the community is a stakeholder, so KEO support of the community becomes an ethical requirement (Bowie 2012).

Some scholars see CSR as a way for organisations to justify particular ways of behaving or acting, that CSR is closely interconnected with ethics and values (Majichrzak-Lepczyk 2014). CSR is a starting point for developing an ethical climate (Hemingway 2005). A KEO's ethical climate influences the kind of ethical problems and dilemmas that the organisation recognises and the processes it uses to resolve these issues (Barnett and Vaicys 2000). Although Government pressure and policy has been the main stimuli for the emergence of knowledge exchange, CSR in knowledge exchange can be understood as exploiting knowledge for social good and public benefit; this can be a reason for academics to want to participate in knowledge exchange (Kitagawa and Lightowler 2013). The possibility of knowledge exchange ethics needs to be considered.

7.5.2   Defining knowledge exchange ethics and values

Definitions of ethics are considered in the Literature Review (Section 2.5.1, pp.35-36). Although these show that "ethics" can be used in four ways, the discussion here focuses on ethics as standards of or benchmarks for behaviour, guidance or rules on what is right and wrong, and values that can be used to guide behaviour (Esfijani et al. 2013).

Each approach to considering ethics has its strengths and weaknesses. Teleological approaches focus on the outcomes or consequences of an action rather than the criteria used to guide or determine the action. A main objection to deontological or principles-based approaches to ethics is that they do not provide enough guidance for ethical decision making; principles, rules or responsibilities can conflict (Resnik 2012). Principles-based or deontological approaches to ethics only determine the form or shape of values, not the substance, content or detail and the actors (organisations or individuals) are still responsible for explaining or justifying their actions or behaviour (Ketola 2008). Virtues-based ethics, which focus on personal characteristics, offer organisations a starting point for their conduct and decision making (Ketola 2008; Ehrich et al. 2011). However virtues-based approaches, do not provide a sufficient starting point for making decisions either (Ketola 2008). A virtues-based approach does not help with enforcing ethical policies or codes, or decision-making (Resnik 2012). Although discussions about organisational ethics tend to be divided between

utilitarian and deontological approaches, this divide is not realistic in practice as organisational ethics are more complex in real life (Ketola 2008). A logical conclusion would be that some kind of combined approach would offer a starting point to define knowledge exchange ethics.

One approach to this is to consider the kind of approaches that be taken to describing the ethics of knowledge exchange. There are universal ethical values which can be approached and are found in deontological principles-based ethics (which lead to rights and justice ethics) and virtue ethics (Ketola 2008). Virtues-based ethics or universal values offer a starting point for KEO conduct and actions (Ketola 2008). Developing virtues or moral character and complying with rules or principles complement each other (Ketola 2008).

The research findings show that independence of academic thought is paramount; academics and knowledge exchange practitioners cannot not be told what decision or result they are going to come to; academics should not have their opinion swayed. As part of this, knowledge exchange practitioners have to rely on their own personal integrity and judgment, their own sense of what was right and wrong. Most knowledge exchange practitioners and academics would not do anything inappropriate or immoral, but senior KEO staff can come under severe pressure and can be challenged. Individuals in KEOs making ethical decisions can face such strong outside pressures, that they can risk losing sight of their decisions and behaviour in trying to satisfy their stakeholders (Kelley and Chang 2007).

Some researchers such as Schwartz have tried to link individual values to actions and behaviours (Beatty et al. 1985; Schwartz and Boehnke 2004). In philosophy, values are understood as a form of ethics or as abstract moral principles that enable individuals to choose between different ones depending on the situation (Corner et al. 2014). Values can be seen as a set of moral principles that set standards and provide guides for deciding between right and wrong (Corner et al. 2014). Moral or ethical values are seen as kind of actions that could harm or cause harm to others or are thought of as taboos (Brey 2004). This kind of approach where values are used as ethical boundaries can provide a starting point for defining values in knowledge exchange.

The discussion in the Literature Review (Section 2.5.2, pp.36-37) set out four criteria which could be used to assess the efficacy of applying ethical theory to functions, such as knowledge exchange (Whetstone 2001). The approach used here attempts to reflect these criteria. So any ethical theory which is used to underpin recommendations for ethical practice and behaviour in knowledge exchange should be relevant and appropriate, and provide substantive, practical guidance for knowledge exchange practitioners, academics and management in dealing with day to day issues, situations and challenges (Noland and Phillips 2010). Approaches to knowledge exchange ethics and values need to be based on the research findings and be appropriate. Any approach to knowledge exchange needs to be based on common ground between traditional academic values and knowledge exchange, and reflect the changing roles and position of KEOs and position of knowledge exchange in KEOs.

Using the academic values identified by knowledge exchange practitioners in this research can form a starting point for knowledge exchange values. In defining the ethics and value of knowledge exchange, account also has to be taken of the ethical limits or boundaries which knowledge exchange practitioners identify. As a starting point, the academic values identified in the research findings as the most significant ones can be compared with the ethical boundaries which the data recognised. Table 7.1 summarises this.

Academic Values	Ethical boundaries
Reputation	Protecting and sustaining reputation
Integrity	Integrity
Independence	Independence
Public accountability	Exploiting resources and people
Credibility	Duty of care
Trust	Do no harm – physical, mental and environmental
Transparency	Purpose and end use of research and the means used to carry out research
	What the letter and the spirit of the law allow

Table 7.1 Comparing values, ethical boundaries and ethical issues

Table 7.1 shows that three academic values are also ethical boundaries: independence, integrity and reputation. These can provide a starting point for defining the ethics of knowledge exchange.

As well as defining ethics for knowledge exchange, the values of knowledge exchange also need to be considered. The ethical boundaries which are identified in the research findings express implicit values. So this can provide another approach to defining ethics and values of Responsible Knowledge Exchange. An alternative approach is to compare the values, ethical boundaries and ethical concerns which are identified in the research findings; Table 7.2 illustrates what emerges.

Values	Ethical boundaries	Ethical issues
Reputation	Do no harm – physical, mental and environmental	Working with contentious organisations
Integrity	What the letter and the spirit of the law allow	Threats to academic freedom
Independence	Purpose and end use of research and the means used to carry out research	Exploitation
Public accountability	Exploiting resources and people	Conflicts of interest
Credibility	Duty of care	Breaching confidentiality
Trust	Protecting and sustaining reputation	Lack of transparency
Transparency	Independence	International
	Integrity	Other ethical issues

Table 7.2 Comparison of values, ethical boundaries and ethical issues

As discussed in the literature review Literature Review (Section 2.5.5, pp.38-40), values can be used as ethical boundaries in the sense of personal beliefs, as motives or drives to behave, act and make decisions, as ends in themselves, as guides to behaviour, actions and decisions, and as standards to assess actions and behaviour. For example, Schwartz's selection of values such as "honour", "transparency", "accountability", "honesty" and "responsibility" can be used as a starting point for trying to define knowledge exchange values (Schwartz and Boehnke 2004). In this way, ethical boundaries can be used as values in these senses; for example, an ethical value of "do no harm" can be used as a personal belief, as motives or drives for action, a guide to behaviour, or as a standard to assess someone else's actions.

In comparing academic values, ethical boundaries and ethical issues, there are two common main themes: independence and lack of transparency. This can be taken further. Table 7.3 shows what happens when ethical boundaries identified in the data are compared to assess whether they can also be used as values.

	Values as personal beliefs	Values as motives or reasons	Values as guides	Values as standards/ criteria
Ethical boundary - duty of care	I believe in duty of care	I act to ensure duty of care for my family	It is my responsibility/I have a duty to protect those I love	His behaviour failed to protect the birds
Ethical boundary - allowed by/within the scope of the law	I believe in complying with the law	I comply with the law	What I want to do is within the law	His behaviour was illegal
Ethical boundary - end use	I believe that research should have an appropriate end use	I undertake research to help improve social welfare	Undertaking research to create weapons to attack people is wrong	Research undertaken for illegitimate purposes
Ethical boundary - exploitation	I believe that people should not be exploited	I will not undertake research that exploits people	Exploiting people is wrong	Tobacco companies exploit people
Ethical boundary - do no harm	I believe in not harming animals	I take care to do no harm	I will not hurt anyone	Their behaviour damaged the plants

Table 7.3 Ethical boundaries and values in the research findings

It is interesting to see that the approach used in Table 7.3 does not work for conflicts of interest. It shows that that some ethical boundaries can stand as values: allowed by or within the letter of the law, do no harm, duty of care. The ethical boundaries of end use and exploitation tend hold up as values. Table 7.4 shows the results of using the academic values which knowledge exchange practitioners identified as ethical boundaries.

	Values as personal beliefs	**Values as motives or drives**	**Values as guides**	**Values as standards or criteria**
Ethical boundary – independence	I believe in independence	As I carry my own bag, I am independent	I want to earn my way so that I can be independent	She cannot make her mind up. She is so dependent on what others think
Ethical boundary – honesty	I believe in honesty	I am honest so I obey the law	Being honest pays	He was dishonest
Ethical boundary – transparency	I believe in being open	I am open about my views so that others know what I think	Being transparent means that I am myself	He is not transparent in his dealings
Ethical boundary - trust	I believe in trusting people	I trust others so that they will know that I am sincere	Trusting people is easier than being suspicious	As he distrusted people, he was not popular
Ethical boundary - reputation	My reputation is important to me	I am honest so that I do not damage my reputation	I want to have a good reputation	His reputation was undermined by his dishonesty

Table 7.4 Academic values as ethical boundaries

So some ethical boundaries can stand as values: allowed by or within the letter of the law, do no harm, duty of care. Some values, such as independence, honesty, transparency and reputation can function as ethical boundaries. Some values such as trust do not seem to work as ethical boundaries. So this leads to values and ethical boundaries of: reputation, independence, not exploiting people and resources, integrity, purpose and end use of research and means used to carry out research, accountability, what the spirit and the letter of the law allow, credibility, transparency, and trust. However, it seems that "not exploiting people and resources" and "do no harm" are the same thing, and "do no harm" also means "protect". So the combined value could be "protect people and resources". The combined results of these analyses are set out in Figure 7.2 and can be used as the starting point for describing the ethics and values of Responsible Knowledge Exchange.

Figure 7.2 Values and ethics of knowledge exchange

Most ethical issues are grey rather than black or white and this applies to KEOs as well (Blevins and Ewer 1988). Many KEOs have a range of varied kinds of values (Ketola 2008). In undertaking research, KEOs and academics often have a goal or objective when they start, such as answering a research question. KEOs will need to resolve potential ethical conflicts between their social and public interest roles and becoming more commercial and corporate (Kezar 2004). Academics can hold values that may conflict, such as their personal and professional values (Kelley and Chang 2007). Academics are nervous about too many rules and regulations as they could undermine academic freedom (Bruhn et al. 2002). KEOs will need to find ways to balance growing "corporatism" (see Section 2.3.4, p.24) and commercialisation with their social and public good roles

and responsibilities (Kezar 2004). The approach to values and ethics of knowledge exchange set out in Figure 7.2 offers a starting point for beginning to address this conundrum.

7.6   Responsible Knowledge Exchange

The discussion has explored the features and the landscape of Responsible Knowledge Exchange. The elements of Responsible Knowledge Exchange have been derived from the research findings and elements of the literature review. Figure 7.3 maps the features of Responsible Knowledge Exchange, and Figure 7.4 shows the relationship and interaction of the elements of Responsible Knowledge Exchange. Figures 7.3 and 7.4 attempt to capture the elements of Responsible Knowledge Exchange and the relationship between them; they also attempt to summarise the responses to the research questions.
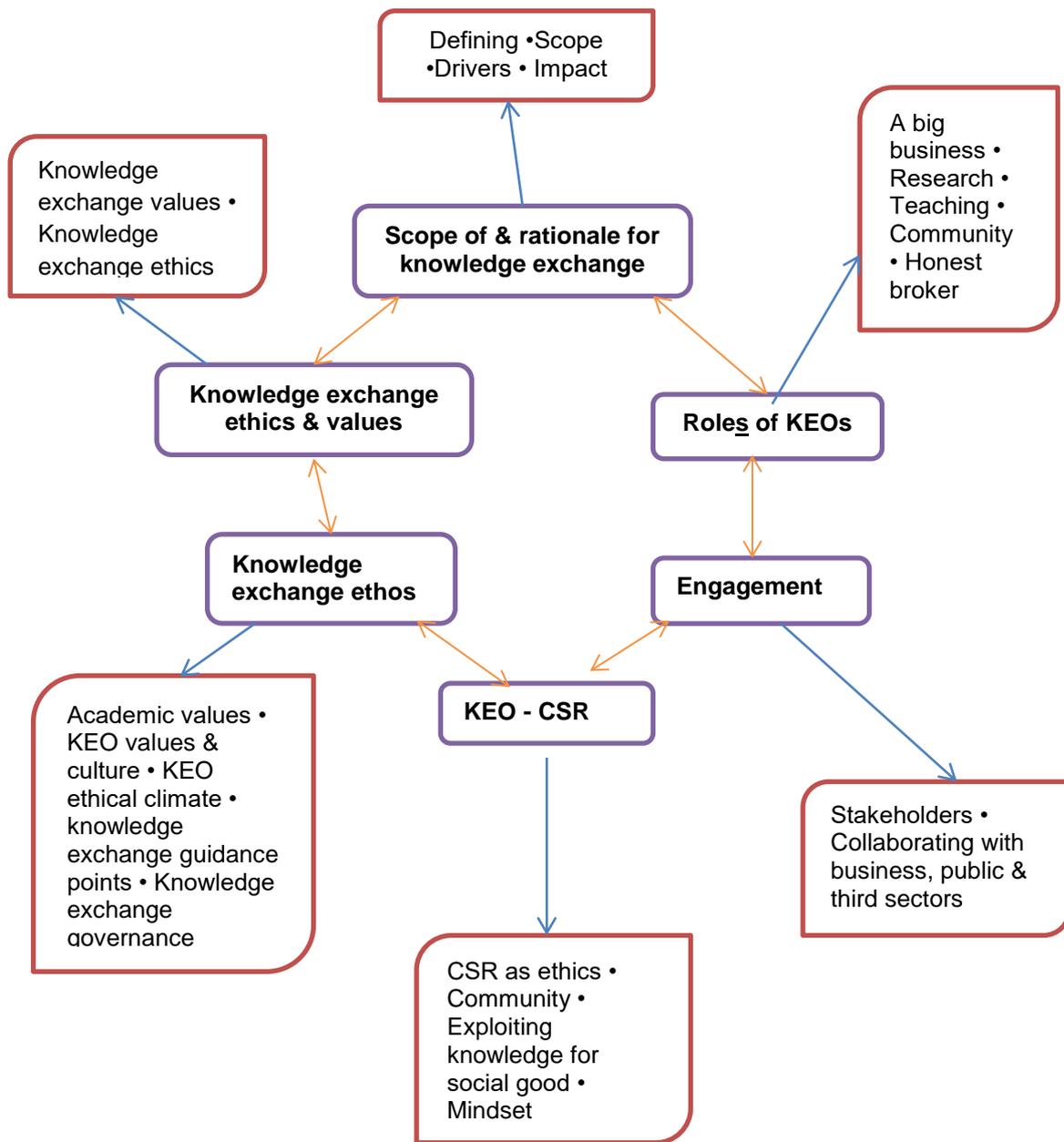
Figure 7.3 Elements of Responsible Knowledge Exchange

Figure 7.4 shows the relationship and interaction of the elements of Responsible Knowledge Exchange.
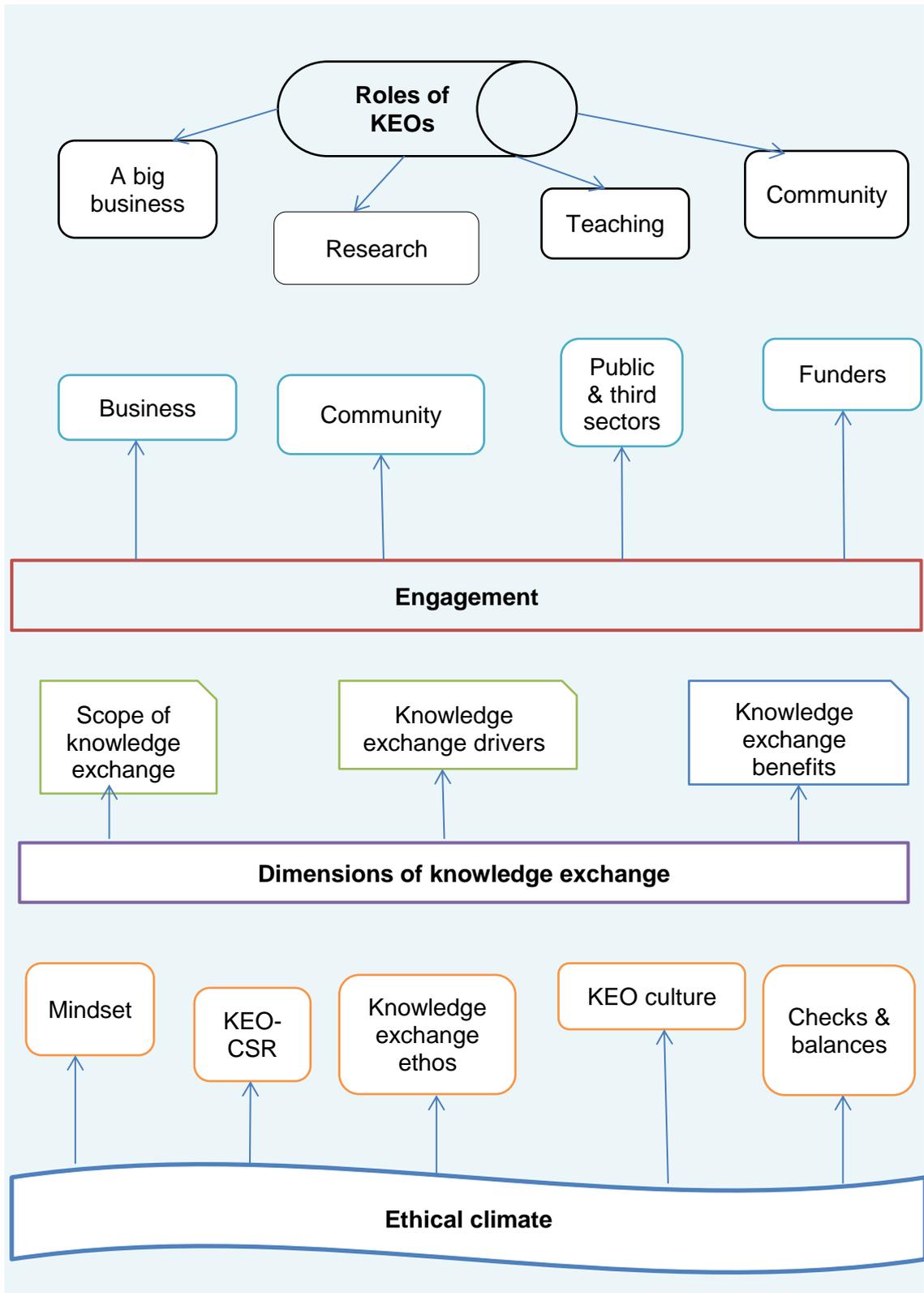
Figure 7.4 The relationship and interaction of the elements of Responsible Knowledge Exchange

Figure 7.4 shows how the four roles of KEOs (as a business, research, teaching and as part of the community) interact with KEOs' engagement with business,

the community, funders, public and third sectors through the dimensions of knowledge exchange (scope, rationale or drivers and benefits, such as impact) come into play. KEOs' engagement activities are influenced by its ethical climate, which comprises mindset, KEO-CSR, knowledge exchange ethos, KEO culture, and the check and balances which KEOs use to govern knowledge exchange.

7.7   Conclusion

This Chapter has looked at the three other elements of Responsible Knowledge Exchange which are illustrated in Figure 6.1 (p.176): KEO-CSR, knowledge exchange ethos, and knowledge exchange ethics and values.

There are three aspects of CSR in knowledge exchange: links between CSR and ethics, CSR as part of KEOs' role in and contributing to the community, and as an implicit mindset of KEOs and academics. CSR and ethics are interchangeable and CSR as ethics is described as being about academic values, with CSR seen as inherent in KEOs' mission and roles, part of the academic mindset. KEOs have a significant moral and social responsibility to the community, as an implicit part of their role. This includes exploiting knowledge and technology for social good by ensuring that a KEO's knowledge is used for the best advantage of research users. The concept of KEOs' role as undertaking knowledge exchange for public good is implied rather than expressed openly.

While Esfijani et al's model (Esfijani et al. 2013) reflects KEOs' roles of research and teaching, a framework for KEO-CSR has to take account of knowledge exchange, and the links between CSR and ethics. By combining elements of CSR which the research findings reveal with elements of Esfijani et al (2013)'s model of USR (Esfijani et al. 2013), a new model of KEO-CSR emerges. This definition of KEO-CSR helps to define some of the main elements of Responsible Knowledge Exchange.

Mertonian values, albeit in a modified form, continue to be valid; Mertonian norms come close to being a "philosophy of academia". Academic freedom or

independence is seen to be an integral element of academic ethos. Integrity and reputation emerged as the most highly rated academic values in the data, together with independence, public accountability, trust and transparency, and credibility. Ensuring their reputation and integrity by developing their standing and credibility through their research and publishing is a significant academic aim, and the role of reputation and integrity as academic values does not seem to be addressed in the literature.

Academics are starting to see how knowledge exchange can benefit their research and their career in several ways. In building relationships with external organisations, academics learn about the needs of business and this could influence how they develop their future research and teaching. Engaging with knowledge exchange can help academics to raise their research profile, status, credibility and reputation. There are concerns about threats to academic standards and academic freedom as KEOs encourage academics to engage more with the outside world and secure more external income. The scenarios which were explored in the research findings show how academic values of independence, objectivity, and autonomy underpin academics' and KEOs' decisions.

KEOs' approach to knowledge exchange ethics are aspirational as they can be linked to the kind of organisation that the KEO wanted to be; KEO values tend to reflect the KEO's position towards ethical issues in knowledge exchange. Values can be at the heart of how knowledge exchange practitioners perceive their KEOs; for others, organisational values were less important. Some KEOs link their values to their organisational vision and their strategy.

Few KEOs have clear separate guidance or reference points on knowledge exchange issues, ethics, policies and processes in KEOs. Some KEOs do not have any explicit guidance on or for knowledge exchange; others have clear policies on intellectual policy and commercialisation. This apparent gap in KEOs' policies is not discussed in the literature.

Approaches used to identify knowledge exchange ethics and values have to satisfy several criteria: be relevant, appropriate and practical, be evidence

based, based on common ground between traditional academic values and knowledge exchange and to take account of KEOs changing roles and the position of knowledge exchange in KEOs' mission. Comparing the academic values which the research findings identify with the ethical boundaries which are found in the data leads to the conclusion that the ethics and values of knowledge exchange are reputation, integrity, independence, protecting people and resources, accountability, purpose and end use of research and means, trust, credibility, transparency, and what the letter and the spirit of the law allow. Figure 7.2 (Values and ethics of knowledge exchange, p.226) captures these.

An overview of Responsible Knowledge Exchange is shown in the shaded area in Figure 1.1 (Section 1.3, p.9) where the areas of knowledge exchange, CSR and business ethics meet and overlap. Chapter 6 and this Chapter 7 have explored the components of Responsible Knowledge Exchange: KEOs' roles, scope of and rationale for knowledge exchange, engagement, KEO-CSR, knowledge exchange ethos, and ethics and values of knowledge exchange and are summarised in Figure 6.1 (Section 6.1, p.176). Figure 7.3 (p.228) summarises the discussion about the elements of Responsible Knowledge Exchange. Figure 7.4 summarises how the discussion in Chapters 6 and 7 has also shown how the components of Responsible relate to and interact with each other.

The next chapter (Chapter 8 – Conclusion), considers how the research questions have been answered, explores the contribution to knowledge, the limitations of the thesis and suggests areas for further research.

Chapter 8: Conclusion

8.1 Introduction

This chapter aims to present the conclusions of the research which has explored the concept of Responsible Knowledge Exchange by exploring the interaction between knowledge exchange, CSR and business ethics. The objective of this was consider the scope and rationale of knowledge exchange, consider the relevance of CSR to KEOs and determine the ethics and underpinning values of knowledge exchange.

This chapter considers how the research facilitates understanding of Responsible Knowledge Exchange, the extent to which the research questions have been answered, and the contribution which this study makes. The chapter concludes by identifying some limitations in the research, and suggesting some potentially fruitful areas for further investigation.

8.2 Revisiting the research aim, objectives and questions

8.2.1 Research gap

Since the mid-1980s the Government's policy has been to try to use KEOs' knowledge and intellectual power as a way to support national economic growth. The development of knowledge exchange as part of KEOs' third mission alongside research and teaching in KEOs has formed part of the changing role of public sector research in the UK. KEOs have policies and processes for handling ethics in research and teaching, and do not seem to have developed and implemented arrangements for managing ethical issues which can arise in knowledge exchange.

This research was prompted by professional encounters of ethical issues in knowledge exchange and finding little policy and guidance to refer to help in resolving these. Most research has focused on the motivation and rationale for academics' involvement in knowledge exchange; little research has been

undertaken on the role of knowledge exchange practitioners in KEOs. Similarly, little research has been done to explore ethical issues that arise for academics and knowledge exchange practitioners, and how these can be managed most effectively. Initial reading showed how KEOs and knowledge exchange practitioners had not considered the possibility of how ethical issues could arise and be managed in knowledge exchange; "knowledge exchange ethics" as such did not seem to exist or to have been considered. This led to a conclusion that an in-depth investigation was required to attempt to fill these gaps.

8.2.2 Research aim and objectives

The aim of the research was to explore and define the features and elements of Responsible Knowledge Exchange, their relationships and interactions. Three research objectives emerged: to define and delineate the principles and key elements of Responsible Knowledge Exchange, their relationships and interactions; to determine how CSR is practised and applied in knowledge exchange; and to explore the ethical boundaries and values of knowledge exchange.

The research questions were:
1. What are the scope of and rationale for knowledge exchange?
2. How is CSR applied and practised in knowledge exchange?
3. What are the ethical boundaries and underpinning values of knowledge exchange?

The focus of the research was the knowledge exchange practitioner representing their KEO in their professional capacity. As this was an exploratory study, the research was carried through a pragmatic qualitative study. The aim was to obtain a holistic understanding of Responsible Knowledge Exchange which arises when knowledge exchange, CSR and business ethics meet and interact, as the conceptual framework in Figure 1.1 (Section 1.3, p.9) shows. The research sought to capture the views and voices of professional knowledge exchange practitioners in KEOs, and their perceptions and understanding of knowledge exchange, its underlying values and ethics. The research also explored possible connections with CSR,

including managing stakeholders and the relationship between academic values and knowledge exchange.

8.2.3   Scope of and rationale for knowledge exchange

The research findings offer new insights into the scope and rationale of knowledge exchange. The thesis proposes a new understanding of the range of knowledge exchange activities by showing how they can be aligned with the kind of intellectual property being used as continuum or spectrum. This differs from the model which Abreu and Grinevich (2012) propose where knowledge exchange activities are classified according to the kind of knowledge on which they are based and using different ways of protecting intellectual property. The new approach offers a more direct and immediate way of understanding the scope of knowledge exchange, by moving along the spectrum or from knowledge exchange range of knowledge exchange activities, and seeing how they connect with different kinds of knowledge or intellectual property.

Other findings highlight the interconnection between knowledge exchange and research in two ways: either as something that is undertaken after research is completed in STEM (a linear process) or as a feedback loop between research and knowledge exchange in social sciences, arts and humanities. As these two metaphors indicate, knowledge exchange is a much more multi-faceted and complex process (Lockett et al. 2015). The other insight is that knowledge exchange can be seen as a social process, where potential research users can stand to benefit (Harrington and Kearney 2011). This approach can involve adapting particular research results and outcomes to meet particular needs of research users by consulting with them to identify possible application(s). Knowledge exchange involves raising awareness about a piece of research, its implications and giving potential research users an opportunity to discuss it, and possibly extend it. From this perspective, knowledge exchange is about communicating and creating visibility for research. In this sense knowledge exchange is a way for KEOs to demonstrate their continued relevance to the Government, and enables them to strengthen the case for publicly funded investment in research.

Looking at the drivers for knowledge exchange, the two main motivators stem from Government policy. KEOs allegedly have a role to play in contributing to economic growth and need to generate additional income to replace reductions in public funding (Fazackerley et al. 2009; Benneworth and Jongbloed 2010). An attraction for academics to get involved in knowledge exchange is that it offers opportunities to co-create knowledge by working with external organisations. This helps academics to ensure their research is leading edge, disseminated and applied in the real world. With the coming of impact, academics are increasingly expected to promote their discipline and apply it to the outside world through public outreach or engaging with business (Cosh et al. 2014). Academics are participating in knowledge exchange to find ways of undertaking research they want to do, and because it is now becoming "essential" (Mendoza 2012; Szelényi and Bresonis 2014).

Knowledge exchange and impact are also intertwined. Knowledge exchange is not only creates impact in and of itself, it also assists in creating other kinds of impact. The impact of research in STEM is more tangible, and it can be identified more easily than in the social sciences. In the humanities and social sciences, the impact of research is harder to discern as it might not be linked directly. In KEOs there is a very big push towards justifying the money put into research and demonstrating the return on the investment; impact is a means to prove this. Impact can also be seen as KEOs and academics giving something back by promoting their subject and showing the relevance of their research and teaching, discipline area and applying it to the outside world (Hughes and Kitson 2012; Cosh et al. 2014).

The changing roles of KEOs can be summarised as KEOs wearing four "hats" (as major businesses, research, teaching, and supporting their community). KEOs have always been run like large, academic led businesses, although KEOs tend to make final decisions based on academic rather than financial considerations. The outward facing role of KEOs in their communities is significant as an employer, a supporter of local business, an honest broker and as a public space. Seeing the functions and roles of KEOs in this way provides a context for trying to understand the different approaches to understanding the

changing roles of KEOs, such as academic capitalism, triple helix, entrepreneurial KEO, and pure ("Mode 1") and applied ("Mode 2") research. Although there is some evidence to support each of these models (Etzkowitz et al. 2000; Redford and Fayolle 2014), there are also some contra-indicators (Anderson 2001; Tuunainen 2005; Nelles and Vorley 2010; Mendoza 2014). In practice, knowledge exchange practitioners tend to talk about pure and applied rather than "Mode 1" and "Mode 2" research.

8.2.4 Practising and applying CSR in KEOs

In attempting to assess how CSR is applied and practiced in KEOs, research into CSR has focused on how business have attempted to meet their social responsibilities, the reasons for doing so and approaches taken to understand the phenomenon (Porter and Kramer 2006). However, it seems that consideration of the application and relevance of CSR in KEOs has been limited (Mehta 2011); attempts to do so in practice have tended to focus on sustainability and environmental issues(Higher Education Funding Council for England (HEFCE) 2011b). CSR is relevant to KEOs in four ways: as a synonym for ethics, as an aspect of KEOs' role in the community, as an attitude or mindset in KEOs, and as an aspect of knowledge exchange by exploiting knowledge for social good and public benefit.

The answer to this research question of how CSR is practised and applied in KEOs, emphasises that "engagement" is a significant element of Responsible Knowledge Exchange. CSR in knowledge exchange involves ensuring that the knowledge a KEO has is used for the best intentions and to the best advantage of society. Some KEOs are willing to support activities that offer broader societal benefit. CSR is part of KEOs' involvement in the community and is interlinked with KEOs' role of having a community focus. This community dimension involves KEOs being a good neighbour, an organisation others are happy to interact with, as they are aware that KEOs have consistent and transparent values. It means a KEO understanding its impact on the local community, and giving something back.

The concept of the role of KEOs as a public good is implied rather than expressed openly. CSR is implicit in what KEOs do, a fundamental part of their mission and values. Although there is not an explicit idea in KEOs that they have to do good for society, academics are inherently aware of their social responsibilities. The research findings also demonstrate how CSR in KEOs is a facet of KEOs' roles and is inherent in their remit.

Using these research findings and incorporating them into an existing concept of USR in the literature (Esfijani et al. 2013), a framework for KEO-CSR is developed. This is shown in Figure 7.1 (Section 7.2.3, p.204). KEO-CSR provides an explicit link between the roles of KEOs, including knowledge exchange, CSR and ethics.

Trying to answer this research question opened up two additional areas to consider: KEO and knowledge exchange stakeholders and how KEOs decide how to collaborate with business. Although some research has been undertaken on KEO stakeholders, the research findings show how knowledge exchange practitioners are confused about whether KEOs and knowledge exchange share the same stakeholders (Jongbloed et al. 2008). The research findings confirm that knowledge exchange stakeholders are a subset of KEO stakeholders, particularly where knowledge exchange is integrated into the mission of the KEO as one of its main roles.

Despite the attention to stakeholder theory and stakeholder management in the literature, KEOs seem to find it difficult to identify and manage stakeholders in practice (Mainardes et al. 2011; Bowie 2012). This has led to concern about whether stakeholder theory can readily be applied in practice. It is not clear whether these difficulties apply to other kinds of organisations as well as KEOs, which indicates a potential gap in stakeholder theory. There is scope to develop a modified approach to stakeholder management to help KEOs manage their stakeholders effectively (Alves et al. 2010).

Another significant finding is that KEOs use different approaches and policies in deciding whether to work with an organisation; they do not seem to have any clear or express criteria for doing so. This is more apparent when KEOs are

deciding whether or not to work with controversial or contentious sectors and organisations, such as defence and tobacco. KEOs seem to use criteria other than financial return, such as political, ethical, legitimacy or reputational reasons. Little research has been undertaken into the role of the respective KEO and knowledge exchange actors involved in making these kinds of decisions. The research findings highlight uncertainty in this area, particularly where potentially contentious strategic and reputational issues can arise. Therefore the current research has addressed a gap in the approaches which KEOs take in deciding with whom to collaborate.

8.2.5 Ethics and values of knowledge exchange

The research findings confirm the persistence of a modified form of academic values in KEOs in two ways: as ideals and the relevance of academic values or Mertonian norms for academics and KEOs. Independence or academic freedom is a strong moral value for academics and is seen to be an integral element of academic ethos in three ways; an academic being able to choose what to research to undertake and how, deciding with whom to collaborate, and having the ability to use knowledge they gain in their future research.

Academic values underpin KEO organisational culture. Some KEOs do not have organisational values and tend to rely on academic values as implicit or inherent in their culture. Although there are variations among different kinds of KEOs, across all KEOs integrity and reputation emerge as the most highly rated knowledge exchange values. These are followed by independence, public accountability, credibility, with transparency and trust ranked equally.

Knowledge exchange could pose a threat to academic values, through the demands of external organisations, such as business, requiring confidentiality, wanting a veto on publications and wanting to own the intellectual property in the results of research that KEOs may undertake for or with them. There are concerns about threats to academic values, standards and academic freedom as KEOs try to increase their external income and relationships. The scenarios explored in the fieldwork show that this is a reality for academics, and illustrated how that they endeavour to find ways to adhere to academic norms in these

kind of situations. The research findings show that most academics take an objective standpoint and are not influenced by the fact that a company was paying for the work. The only exception to this is an apparent growing trend for KEOs to accept business locating equipment on KEO campuses for academics and students to use, and so giving an implicit endorsement.

On the other hand, some academics are finding ways to satisfy the demands of collaborating with external organisations without compromising their academic and professional identity. Academics are increasingly willing to engage with knowledge exchange and impact, and to use their judgment to find an appropriate balance between knowledge exchange and research. Academics can be influenced by market developments, social or economic needs, and still undertake their research within a framework of academic values. Knowledge exchange can strengthen academics' research and their career, and raise their profiles. In building relationships with external organisations, academics learn about the needs of business and this can influence how they develop their future research and teaching. Gaining recognition, getting their research used in some way, securing credibility and finding partners for future research are real motivators for academics; knowledge exchange is seen as a mean to achieve these.

KEOs like to think they are seen as principled organisations. Most people work for KEOs because they value something about their ethos. KEOs' values and approach to knowledge exchange ethics tend to reflect their position towards ethical issues in knowledge exchange. Unfortunately many KEOs do not provide guidance on knowledge exchange issues. These are often covered by other policies that apply mainly to research, such as codes of conduct or ethics, or statements of organisational values. Many KEOs deal with knowledge exchange issues on a "case by case" basis, and do not have any knowledge exchange ethics processes, policies or codes of conduct similar to those in place for research for knowledge exchange. The literature on ethical climate implies a link between ethical climate and organisational values. Just as KEOs' codes of ethics tend to focus on research, the lack of explicit values and ethics

for knowledge exchange implies a gap between aspiration and practice which needs to be addressed.

It is also clear that the role of ethics committees in KEOs tends to only embrace research issues and do not extend to knowledge exchange opportunities and issues. It is not clear that the roles and remits of ethics committees reflect the position of knowledge exchange in KEOs; for example, whether ethics committees cover research and knowledge exchange where knowledge exchange is integrated alongside research and teaching or, if ethics committees tend to focus on research issues only in KEOs where knowledge exchange is managed separately from research and teaching.

Using a modified set of academic values provides a starting point for identifying the ethics and values of knowledge exchange. A particular ethical theory or approach such as teleology, deontological or virtues based cannot of itself provide a satisfactory answer to defining knowledge exchange ethics. Any approach has to be evidence-based and practical. In philosophy values are thought of as a form of ethics, a set of moral principles that guide and set standards for deciding between right and wrong. So the values which knowledge exchange practitioners have recognised can provide a starting point for trying to capture the ethics and values of knowledge exchange. Similarly, the ethical boundaries which knowledge exchange practitioners have identified can also be taken into account. A comparison and analysis of the preferred academic values and ethical boundaries and their interaction with KEO-CSR leads to a mapping of the ethics and values of knowledge exchange. These are summarised in Figure 7.2 (Section 7.5.2, p.226). The values and ethics of knowledge exchange comprise reputation, independence, accountability, credibility, trust, purpose and end use of research, and the means used to carry it out, transparency, what the letter and spirit of the law allow, and protecting people and resources. Identifying or mapping the ethics and values of knowledge exchange provides the final piece in the jigsaw of Responsible Knowledge Exchange.

Having answered the research questions, it is clear that the concept of Responsible Knowledge Exchange is plausible. The six elements of

Responsible Knowledge Exchange (Figure 7.3, Section 7.5.2, p.228) comprise: the scope and rationale of knowledge exchange; role of KEOs: engagement; KEO-CSR; knowledge exchange ethos; and knowledge exchange values and ethics. Figure 7.4 (Section 7.5.2, p.229) illustrates how these features of Responsible Knowledge Exchange are interrelated and how they interact.

8.3 Contribution and implications

This thesis contributes to knowledge in three ways: to academic knowledge, to knowledge exchange professional practice, and to knowledge exchange policy. The thesis attempts to bridge a gap in KEO ethics by exploring the values and ethics of knowledge exchange as KEO's third role alongside teaching and research. The study finds interconnections between the roles of KEOs and the practice of CSR, between CSR, academic values and the practice of knowledge exchange. The research identifies a new way of understanding the scope of knowledge exchange, explores the relationship between knowledge exchange and impact, and offers new insights into the roles of KEOs. The thesis identifies potential gaps in the application of stakeholder theory in KEOs and in the understanding of the strategies and approaches that KEOs use in deciding how to work with business, particularly controversial sectors and organisations, such as tobacco and defence. The thesis suggests how modifying an existing approach to CSR in KEOs can offer additional insights to the practice and relevance of CSR to KEOs by defining KEO-CSR. The research indicates that the role and remit of KEOs' ethics committees tends to omit knowledge exchange and their terms of reference could usefully be revisited, where they have not already have been. Academic values, albeit modified, persist and sit alongside the incorporation of knowledge exchange into KEOs' roles and provide a starting point for informing knowledge exchange ethics and values. Finally the thesis validates the concept of "Responsible Knowledge Exchange" and its features as Figure 7.3 (Section 7.5.2, p. 228) illustrates. Figure 7.4 (Section 7.5.2, p.229) takes this one step further by identifying how the elements of Responsible Knowledge Exchange come together and coalesce.

8.3.1 Contribution to academic knowledge

The rationale for this study is twofold: to address a gap in KEO ethics by exploring the issues surrounding ethics and values in knowledge exchange, how they should be addressed and the kind of questions that should be asked; and to consider where and how where the concepts of knowledge exchange, CSR and ethics intersect and overlap to form Responsible Knowledge Exchange.

Several threads are woven into the research. There is a significant body of literature about knowledge exchange, CSR and ethics in their own right; this research has demonstrated their interrelationships. This research takes the discussion forward by demonstrating how CSR is an implicit part of the KEO and academic mindset, how KEOs determine how to engage with external organisations, the relevance of a modified set of academic values in underpinning KEO and knowledge exchange practitioners' decision-making and contributing to defining parameters in which KEOs and knowledge exchange practitioners can operate ethically and responsibly.

The research shows how the scope of knowledge exchange can be viewed from a new perspective. Knowledge exchange can be seen as a spectrum of activities which can be categorised according to the nature of the intellectual property involved. This way of perceiving knowledge exchange offers a richer alternative to Abreu and Grinevich (2012)'s model, as the degree of firmness of the intellectual property determines whether an activity comes within or is categorised as knowledge exchange, knowledge transfer or technology transfer. It also demonstrates how different kind of intellectual property involved to particular knowledge exchange activities.

Although the theory of stakeholder management is well established in the literature, the research highlights KEOs' engagement or involvement with external organisations, and the difficulties that KEOs can encounter in applying stakeholder management, such as deciding which organisations and sectors to collaborate with. The research confirms Alves (2010)'s assertion that an empirical theory is needed to help organisations, including KEOs, to decide to

which stakeholders they should be giving time and attention, when and how (Alves et al. 2010). The research has also addressed a gap in the literature on the role of the respective KEO and knowledge exchange actors involved in making decisions about which external organisations to collaborate with. This is highlighted in the strategies and criteria KEOs develop and use in making decisions about potential collaborations with external organisations where potentially contentious issues can arise.

Most research on CSR has focused on its relationship with business. By building on a recent approach to the application of CSR in universities (Esfijani et al. 2013), the research proposes a new concept of KEO-CSR and confirms that CSR is an implicit part of the academic and KEO mindset. KEO-CSR provides a bridge between the roles of KEOs', knowledge exchange and KEO ethics.

The research shows that knowledge exchange's threat to academic values may not be as damaging as anticipated or believed. The research confirms takes Lam's (2010) study further to show how knowledge exchange practitioners continue to believe in the continued validity of Mertonian norms, albeit in a modified form, where integrity and reputation are the most highly rated academic values. In terms of policy, the thesis throws new light on the roles of KEOs and the persistence of academic values in underpinning KEO culture and ethical climate, after the introduction of knowledge exchange. The research throws light on the spaces or ethical boundaries within which KEOs and knowledge exchange practitioners can operate ethically and responsibly by identifying how values can stand as ethical boundaries.

Knowledge exchange practitioners are the focus of this study. As they tend to share a similar professional outlook, for the purposes of the research, their KEOs are treated as a homogeneous group. However the research has revealed differences between pre-1992 and post-1992 universities in two areas: academic values and managing academic consultancy. For knowledge exchange practitioners based in pre-1992 universities, reputation is the most important academic value, followed by integrity and credibility. In post-1992 universities, on the other hand, integrity is the most highly rated value, followed

by reputation and, independence. Academic consultancy is the other area where differences between between pre-1992 universities and post-1992 universities were observed. Unlike pre-1992 universities which have official policies or informal practices whereby academics can undertake outside consulting, post-1992 universities, have retained their former local authority employment terms and conditions; these do not give academics an allocation of time to undertake consultancy.

8.3.2   Contribution to professional practice

This research has shown how ethical issues arise in knowledge exchange and how managing these is a task that still needs to be completed. Although academic and research ethics have been addressed, knowledge exchange ethics are still out in the wild west, lagging behind approaches to CSR taken in business.

This thesis contributes to practice in knowledge exchange networks, such as AURIL, PraxisUnico and IKT. This research does not aim to argue that knowledge exchange professional networks should look to develop and implement codes of ethics or conduct for their members; this research is not even trying to encourage them to do so. Doing so would have disadvantages as well as advantages. This thesis has made a first attempt to identify knowledge exchange ethics and values. In doing so, it may encourage and open up debate and discussion about ethical issues and concerns that can arise in knowledge exchange, and also help to define ethical boundaries more clearly. Using the concept of Responsible Knowledge Exchange may prompt knowledge exchange professional networks to develop ways and ideas for handling and managing ethical issues in knowledge exchange, such as conflicts of interest.

It may also prompt debate about the responsibilities of knowledge exchange practitioners and how the ethics and values of their roles fit with those of their academic colleagues. Raising awareness about the kind of dilemmas that knowledge exchange practitioners can face could help to foster a more ethical culture and climate in knowledge exchange. This kind of approach could also

be linked to the frameworks for Continuing Professional Development which AURIL and PraxisUnico have developed for their members.

8.3.3   Contribution to policy

The research suggests that there are three gaps in current knowledge exchange policy: ethical issues which may arise in knowledge exchange are not always addressed effectively, effective mechanisms to manage them may not always exist and the governance of ethics in KEOs tends to focus on research, rather than research and knowledge exchange. In the light of the interaction between knowledge exchange and research, there is scope for KEOs, and possibly their funders, to consider how to bridge this gap in the governance of knowledge exchange ethics. The most immediate contribution of this research for KEOs is to encourage them to consider the terms of reference of their ethics committees at all levels, from department, faculty to corporate, to ensure that their remit includes knowledge exchange as well as research.

In attempting to explore what Responsible Knowledge Exchange looks like, KEOs may be encouraged to consider and possibly address the kind of values and ethics that they want to promote inside their organisations. The aim is to foster discussion and debate about the issues that can arise in knowledge exchange and to raise awareness about these in KEOs. The findings from this research, particularly on the values and ethics of knowledge exchange, may help to contribute to developing the kind of criteria that KEOs may look for in recruiting knowledge exchange practitioners.

An unexpected empirical finding from the research is the need for KEOs to consider and define strategies and approaches for deciding in how they work with business, especially contentious sectors and organisations. KEOs need to accompany this by, and developing and implementing criteria which can be used for making these kinds of decisions. While these may already be implicit in KEOs' corporate strategies, and other policies and guidance, they need to be considered, thought about and adopted formally. These would also need to promulgated and include in corporate strategies and similar documents. Similar concerns can be raised about KEOs and their stakeholders and this thesis has

shown how KEOs could do much more to manage relationships with their stakeholders more effectively.

In attempting to develop awareness of knowledge exchange ethics, it is very easy for the question of knowledge exchange ethics and values to be subsumed into concerns about research ethics, particularly given the close connections between knowledge exchange and research. However, it is important that knowledge exchange ethics are recognised and accepted as an area for concern in their own right, and this has been one of the implicit aims of this thesis. KEOs and their funders could go some way to meet this by consolidating guidance on knowledge exchange issues, which are currently contained in different policies and guidelines, such as financial regulations, conflicts of interest, intellectual property, codes of conduct and research ethics policies. These kinds of steps and initiatives would help to promote an ethical climate for knowledge exchange among academics, knowledge exchange practitioners and other professional staff, and KEO senior management.

8.4 Limitations and possible areas for future research

As this was an exploratory study, the scope of the research has deliberately focused on the supply side of knowledge exchange in KEOs and on knowledge practitioners, rather than on business or the public sector as the demand side, or the interaction between KEOs and business. Similarly this research has focused on knowledge exchange rather than other forms of third mission activities, such as community engagement or public engagement, or KEOs' third mission role as a whole. Finally by treating KEOs as a homogenous group, the findings may not fully reflect subtle differences among the views and perceptions of knowledge exchange practitioners.

There could be scope for a study which compares the motivations, ethics and values of both the supply and demand sides, such as academics and knowledge exchange practitioners in knowledge exchange, and their equivalents in business, the public or third sectors. This kind of approach could

allow a comparison between the demand and supply sides of knowledge exchange. Another area for investigation could be to explore the ethics and values of other third mission activities or those of KEOs' third mission role as a whole and how they relate to academic culture. Another avenue for research would be to build on the insights of the current research by, for example, using a case study approach, within say two to six KEOs, or different kinds of KEOs, such as universities and PSREs, or between pre-1992 and post-1992 universities, or focusing on particular faculties, schools and departments within one KEO. Such an investigation could offer other useful findings and perspectives and enrich the insights which this study has produced.

8.5 Conclusion

This chapter has considered the implications of the main findings of this research, explored how this study contributes to academic knowledge, knowledge exchange professional practice, and policy and practice in knowledge exchange. The limitations of the thesis were addressed and areas for possible future were explored, as well as the strengths and limitations of the thesis.

The purpose of this research was to explore the features of Responsible Knowledge Exchange by looking at the interaction of knowledge exchange, CSR and ethics. It did so by considering the rationale for and scope of knowledge exchange, looking at how CSR was applied and practised in KEOs, and investigated the ethics and underpinning values of knowledge exchange.

The hoped for destination for this research was to define and explore the features of Responsible Knowledge Exchange. Although the researcher believes that they have arrived at their endpoint, they recognise that there is further research to be done. The research has offered a new perspective on the scope of knowledge exchange, and the relationship between knowledge exchange and research, and the connection between impact and knowledge exchange. The study has shed new light on the roles of KEOs and on how they manage or do not manage stakeholder theory. This research has explored how KEOs decide to work and collaborate with external organisations, particularly

contentious sectors and organisations. The application and relevance of CSR in KEOs has been highlighted and its interaction with KEOs' different roles identified. The relevance and persistence of academic values such as Mertonian norms were explored in different scenarios and how they are applied alongside knowledge exchange. Discussion of academic values opened up exploration of KEO organisational culture and ethical climate and the relevance of these to considering and identifying knowledge exchange values and ethics. The research considered the kinds of checks and balances KEOs in managing knowledge exchange activities, such as academic consultancy, managing spinouts, managing conflicts of interest and the role of ethics committees in managing knowledge exchange.

The ethical questions and concerns which knowledge exchange raise need to be understood to help inform the future shape and direction of knowledge exchange. It is wished that the kind of approach taken in this thesis will support relationships and interactions among knowledge exchange actors and stakeholders, including government and business. It is hoped that the findings of this research will contribute to the consideration and development of Responsible Knowledge Exchange; that is, of the ethics and values of knowledge exchange and the infrastructure which KEOs use to manage and raise awareness of them among knowledge exchange practitioners, academics and knowledge exchange professional networks.

Appendices

Appendix A   Definitions

Academic: An individual employed by a KEO whose main responsibilities comprise research and/or teaching.

Business: Private, public and third sector partners of all kinds and size with whom KEOs interact and engage in many ways (Higher Education Funding Council for England (HEFCE) 2014, pp.474-475).

CSR: Corporate Social Responsibility.

Knowledge exchange networks

There are three main professional knowledge exchange networks in the UK.

- **AURIL** Claims to be the largest knowledge exchange association for knowledge exchange practitioners in the UK and Ireland. It is the largest knowledge exchange network in Europe, with more than 1600 members from KEOs (AURIL 2015; Gilman and Serbanica 2015). AURIL's members include KEOs which are concerned with knowledge exchange generally (Geuna and Muscio 2009).

- **PraxisUnico** Claims to be a world-leading national professional association for public sector knowledge exchange and commercialisation practitioners. Members work in knowledge exchange and commercialisation (KEC) in KEOs to translate research outcomes into social and economic impact. sector, facilitating interactions between the public sector research base, business and government (Gilman and Serbanica 2015; PraxisUnico 2015). PraxisUnico's members tend to include KEOs more focused on exploiting intellectual property and creating spinout companies (Geuna and Muscio 2009).

- **Institute of Knowledge Transfer** Unlike AURIL and PraxisUnico, IKT claims to be the professional body for individual knowledge exchange practitioners involved in innovation, enterprise, and the transfer, exchange, sharing and management of knowledge (Gilman and Serbanica 2015; Institute of Knowledge Transfer (IKT) 2015).

KEO status: Refers to the role or functions of KEOs who are involved in knowledge exchange. There are five roles or functions:

- Funder – KEOs who fund knowledge exchange activities.

- Commissioner – KEOs who commission, but not necessarily fund, knowledge exchange activities.

- Policy Maker – KEOs who develop Government policies on knowledge exchange and associated issues. This includes central Government departments, such as the Department Business, Innovation and Skills, (BIS).

- Advisor – KEOs who advise the Government, knowledge exchange funders, commissioners and practitioners on knowledge exchange and associated issues.

- Practitioner/Doer - KEOs who practise knowledge exchange and/or undertake knowledge exchange activities. These are not to be confused with individual knowledge exchange practitioners who are employed by KEOs or work elsewhere in the knowledge exchange sector.

Public Sector Research Establishments (PSRE): Those organisations listed in Appendix B ("Responding Organisations") of the Sixth Annual Survey of Knowledge Transfer Activities in Public Sector Research Establishments: A Report for the Department for Business, Innovation and Skills, Final Report, February 2011 (Technopolis 2011).

REF - Research Excellence Framework: The system which HEFCE uses to assess the quality of research in universities by periodic peer review and the results of this are used to determine the allocation of HEFCE funding to universities.

Research users: Those stakeholders, individuals, groups, organisations and business who apply, use or benefit from KEO research and knowledge or may potentially do so.

Spinout companies: Companies established by KEOs to exploit their intellectual property developed by academic through their research.

SME: Small and Medium sized Enterprise.

Stakeholder: Individuals, groups and organisations which have a legitimate interest in, interact in some way with or influence a KEO or are influenced by their role, performance, goals, policies, activities, operations or processes.

Appendix B   Participant Information Sheet

Study Title: Exploring Responsible Knowledge Exchange

Researcher: Linda Baines   **Ethics number**: 4132

Please read this information carefully before deciding to take part in this research. If you are happy to participate you will be asked to sign a consent form.

What is the research about?

I am a PhD student at the School of Management, University of Southampton. My research is looking at the concept of "Responsible Knowledge Exchange" by exploring the social responsibility and ethics of knowledge exchange.

Ethics and corporate social responsibility (CSR) have become key priorities for much of industry and the private sector, and academia has developed sound governance frameworks for research. However, little research has been done to explore ethical issues that arise for organisations and individuals involved in knowledge exchange, and ethical questions that knowledge exchange organisations and practitioners can encounter.

The main areas of the research involve looking at the aims of knowledge exchange and the rationale for doing it, exploring how corporate social responsibility and ethics are applied and practised in knowledge exchange, and the ethical boundaries or limits of knowledge exchange.

Participants comprise senior knowledge exchange staff in universities and public sector research establishments (PSREs).

If you agree to take part in the research, a semi-structured interview lasting 60 – 90 minutes will be carried out at your office or other location agreed mutually between you and the researcher.

There are no risks involved in this research.

A participant can withdraw from the research at any time without their legal rights being affected.

Confidentiality

Conduct of this research and the storage and protection of research data will comply with the Data Protection Act and the University of Southampton's policy on this.

Interviews will be recorded and fully transcribed. The recordings and the transcripts will be stored on a password protected computer in a secure location

and only the researcher will have access. A**n interviewee will be assigned an interview number (using a numeric character). An Interviewee's organisation will be referred to as 'organisation N' (using an alphabetic character) that aligns with their assigned interviewee number. People's names or job titles will not be included in reports, but participants should be aware that they may be identifiable through comments that they make.

Participants will be offered a copy of their interview transcript and provided with the opportunity to take out or amend any part of it that they do not wish reported in the findings.

Concerns

If you have any concern or complaint about this research study, participants may wish to contact the research support officer, Angela Faux (risethic@soton.ac.uk) or Dr Martina Prude, Head of Research Governance (mad4@soton.ac.uk).

Further information

Please get in touch if you would like further information:

Linda Baines: Tel: 07906 076571; email: lbb1g11@soton.ac.uk

Appendix C   Participant - Consent Form

Study title: Exploring Responsible Knowledge Exchange

Researcher name: Linda Baines

Study reference:

Ethics reference:4132

Please initial the box(es) if you agree with the statement(s):

I have read and understood the information sheet (Version 1 – 5 October 2012) and have had the opportunity to ask questions about the study.

☐

I agree to take part in this research project and agree for my data to be used for the purpose of this study

☐

I understand my participation is voluntary and I may withdraw at any time without my legal rights being affected

☐

I am happy to be contacted regarding other unspecified research projects. I therefore consent to the University retaining my personal details on a database, kept separately from the research data detailed above. The 'validity' of my consent is conditional upon the University complying with the Data Protection Act and I understand that I can request my details be removed from this database at any time.

☐

Data Protection
I understand that information collected about me during my participation in this study will be stored on a password protected computer and that this information will only be used for the purpose of this study. All files containing any personal data will be made anonymous.

Name of participant (print name)…………………………………………………

Signature of participant………………………………………………………..

Date…………………………………………………………………………

Appendix D Participant Debriefing

Study Title: Exploring Responsible Knowledge Exchange

Researcher: Linda Baines   **Ethics number**:4132

Thank you so much for participating in this study. Your participation was very valuable. It has been acknowledged that you are very busy and very much appreciate the time you devoted to participating in this study. There was some information about the study that could not be discussed with you prior to the study, because doing so probably would have impacted your actions and thus skewed the study results. This form explains these things to you now.

What is the research about?

The overall aim of this research is to explore the concept and principles of Responsible Knowledge Exchange by investigating intersections and interactions between knowledge exchange, corporate social responsibility (CSR) and business ethics.

The objectives of the research are to:

- define and delineate the principles and key elements of Responsible Knowledge Exchange, their relationships and interactions;
- determine how CSR is practised and applied in knowledge exchange; and
- explore the ethical boundaries and values of knowledge exchange.

The main research question is: What are the elements and principles of Responsible Knowledge Exchange, and how do Corporate Social Responsibility and business ethics contribute to Responsible Knowledge Exchange?

Background to the research

For more than 30 years Governments in the UK and US have believed that using and applying knowledge created in universities and public sector research establishments (PSREs) and making it readily available to the public, particularly business, as a way to support economic growth. There is also much debate about the role of corporate social responsibility (CSR) in business; and professions such as marketing, accounting, law, and IT are developing ethical approaches to their practice.

The emergence of knowledge exchange as part of the 'third mission' alongside research and teaching in UK universities has formed part of the changing role of and expansion of higher education and the alleged 'commodification' of knowledge. PSREs are undergoing similar changes, with increasing pressure for their research to underpin the Government's economic agenda. Most UK

universities have embraced knowledge exchange as their 'third mission' alongside research and teaching, with PSREs adopting a similar approach.

Funding agencies such the Higher Education Funding Council (HEFCE) and the Research Councils require academics to demonstrate the impact of their research, the economic, social, cultural, public policy, quality of life and environmental benefits. Knowledge exchange is seen as a way of proving the impact of Government investment in universities and PSREs. There is confusion about whether universities and PSREs undertake knowledge exchange for the public good or to generate additional income. Knowledge exchange's economic impact is perceived as being for public good rather than for financial return to universities and PSREs. The debate on the "impact" of publicly funded research has tended to reinforce this. There is little in the literature about the ethics of knowledge exchange. CSR is seen as a way of linking ethics to organisations' mission and activities; including knowledge exchange and ethical issues that can arise. Although there is no commonly agreed definition of CSR), led by the Higher Education Funding Council for England (HEFCE), universities have taken up CSR, focusing on sustainability and environmental issues, rather than knowledge exchange activities.

Government has given universities and PSREs a central role in defining who owns, pays for and benefits from knowledge exchange. Universities with the support of public funding and governmental endorsement have become suppliers to business of knowledge and intellectual capital, as key economic resources. University and PSRE stakeholders have little say or influence in this. UK universities and PSREs have yet to consider how they can apply CSR to address underlying ethical issues of knowledge exchange activities; connections between knowledge exchange, CSR and business ethics have not been explored. This study aims to do this.

How the research findings will be used

The data from this research will be used for a PhD thesis, and academic research papers and presentations. The results of the research are expected to have implications for knowledge exchange networks, knowledge exchange organisations, knowledge exchange practitioners, professional knowledge exchange networks, funding bodies and policy makers. The research findings could lead to recommendations for managing ethical issues in knowledge exchange, and development of guidance and best practice that could influence the governance of knowledge exchange.

I did not use active deception in this study.

We hope this clarifies the purpose of the research, and the reason why we could not tell you all of the details about the study prior to your participation.

Finding out more

If you would like more information about the research, you may be interested in the following:

Carroll, A. B. and K. M. Shabana (2010). "The Business Case for Corporate Social Responsibility: A Review of Concepts, Research and Practice." International Journal of Management Reviews 12(1): 85-105.

Fassin, Y. (2000). "Innovation and Ethics Ethical Considerations in the Innovation Business." Journal of Business Ethics 27(1/2): 193-203.

Langley, C. and S. Parkinson (2009). Science and the Corporate Agenda: The detrimental effects of commercial influence on science and technology. London, Scientists for Global Responsibility (SGR).

Macfarlane, B. (2012). "I'm an academic and I want to be proud of it." Times Higher Education(No, 2,070): 5.

Stevens, J. M., and J. W. Bagby (2001). "Knowledge Transfer from Universities to Business: Returns for all Stakeholders." Organization & Environment 8(2).

Zomer, A., and P. Benneworth (2011). The Rise of the University's Third Mission Reform of Higher Education in Europe. J. Enders, H. F. Boer and D. F. Westerheijden, SensePublishers: 81-101.

www.auril.org.uk; www.ikt.org.uk;

If you have any questions or concerns, you may contact me:

Linda Baines Email: lbb1g11@soton.ac.uk; mobile 07906 076571

It is very important that you do not discuss this study with anyone else until the study is complete. Our efforts will be greatly compromised if participants come into this study knowing what is about and how the ideas are being tested. Once again results of this study will not include your name or any other identifying characteristics.

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the research support officer, Angela Faux (risethic@soton.ac.uk) or Dr Martina Prude, Head of Research Governance, Research Governance Office, University of Southampton, Southampton, SO17 1BJ. (mad4@soton.ac.uk).

Appendix E Interview Questions

Introduction - About knowledge exchange

1. How did you come into knowledge exchange?
2. How do you define knowledge exchange? Who is involved? What is involved?
3. Why is knowledge exchange undertaken? / Why do knowledge exchange?
4. How does your university/PSRE define/see knowledge exchange?
5. How does your university/PSRE undertake knowledge exchange? What knowledge exchange activities does it undertake?

Social Responsibility

6. How do you understand/see/define 'social responsibility'? Why?
7. How do universities/PSREs have social responsibilities? Who to? Why? What are these? How does your university/PSRE do social responsibility? Are these defined formally?
8. How does knowledge exchange have social responsibilities? What are these? Who to? What social responsibilities do knowledge exchange organisations and practitioner have? Who to?
9. How are these determined?
10. How do you recognise or see social responsibility in knowledge exchange?
11. How does a socially responsible knowledge exchange activity (e.g. consulting, IP licensing or collaborative research or community engagement) differ from an ordinary knowledge exchange activity? How? Why? How have you been involved in any socially responsible knowledge exchange activities? What was it? What was it like? How was it different to usual/ordinary knowledge exchange activities?
12. How do you contribute to social responsibility in knowledge exchange?

Stakeholders

13. How do you recognise a knowledge exchange stakeholder? What criteria do you use? Who or what are knowledge exchange's stakeholders?
14. How does your organisation manage its relationships with knowledge exchange stakeholders? Who is responsible for this? What is your role in this? / How do you contribute to this?

Ethical Boundaries

15. How does your organisation decide who to do business with, which sectors such as business, public, third sector, community, employers? What criteria do you use?
16. How do any of these help your organisation achieve any social responsibilities?

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17. Has your organisation ever declined/refused to do business with someone/an organisation? How was the decision made? What was the reference/starting point? Does the organisation have a clearly defined and agreed policy on this? If so, who is responsible for this - - developing, implementing and reviewing it? Or does your organisation handle this kind of issues on a case by case basis?

18. How does your organisation describe its approach to knowledge exchange? Does it hold any values for knowledge exchange? Are these made explicit or written down anywhere?

19. What kind of reference points or guidance does your organisation use or provide for knowledge exchange staff? Does your organisation have any ethical guidelines for knowledge exchange? Or would it be something that are dealt with on a case-by-case basis?

20. What kind of checks and balances are there in knowledge exchange?

21. Have you ever disagreed with the organisations/persons that your institution has done business with? What did you do? How did you handle this?

Appendix F Interviewees

Interviewee No.	Role level	Org. Code	Organisation Type	KEO Status	Designation
Pilot Study					
1	Executive Director/Director	A	University	Doer	Interviewee No.1-Post-1992 university
2	Executive Director/Director	B	University	Doer	Interviewee No.2-Post-1992 university
3	Executive Director/Director	C	University	Doer	Interviewee No.3-Post-1992 university
4	Head/Manager	D	University	Doer	Interviewee No.4-Pre-1992 university
5	Executive Director/Director	E	University	Doer	Interviewee No.1-Post-1992 university
Main Study					
6	Head/Manager	F	University	Doer	Interviewee No.6-Pre-1992 university
7	Executive Director/Director	G	PSRE	Funder, Commissioner, Policy maker, Doer	Interviewee No.7-PSRE
8	Executive Director/Director	H	University	Doer	Interviewee No.8-Post-1992 university
9	Head/Manager	I	PSRE	Funder, Commissioner, Doer	Interviewee No.9-PSRE
10	Executive Director/Director	J	University	Doer	Interviewee No.10-Pre-1992 university
11	Head/Manager	K	University	Doer	Interviewee No.11-Post-1992 university
12	Executive Director/Director	L	KEO-Other	Advisor, Doer	Interviewee No.12-KEO-Other

13		M			Recording unusable
14	Executive Director/Director	N	University	Doer	Interviewee No.14-Post-1992 university
15	Executive Director/Director	O	University	Doer	Interviewee No.15-Post-1992 university
16	Executive Director/Director	P	University	Doer	Interviewee No.16-Post-1992 university
17	Head/Manager	Q	University	Doer	Interviewee No.17-Pre-1992 university
18	Executive Director/Director	R	University	Doer	Interviewee No.18-Pre-1992 university
19	Head/Manager	S	University	Doer	Interviewee No.19-Post-1992 university
20	Executive Director/Director	T	University	Doer	Interviewee No.20-Post-1992 university
21	Head/Manager	U	KEO-Other	Funder, Commissioner, Policy maker, Doer	Interviewee No.21-KEO-Other
22	Head/Manager	U	KEO-Other	Funder Commissioner, Policy maker Doer	Interviewee No.22-KEO-Other
23	Executive Director/Director	V	KEO-Other	Doer	Interviewee No.23-KEO-Other
24	Head/Manager	W	KEO-Other	Advisor	Interviewee No.24-KEO-Other
25	Executive Director/Director	K	University	Doer	Interviewee No.25-Post-1992 university
26	Executive Director/Director	X	University	Doer	Interviewee No.26-Pret-1992 university
27_1	Executive Director/Director	Y	University	Doer	Interviewee No.27_1-Pre-1992 university

27_2	Head/Manager	Y	University	Doer	Interviewee No.27_2-Pre-1992 university
28	Head/Manager	Y	University	Doer	Interviewee No.28-Pre-1992 university
29	Executive Director/Director	Z	University	Doer	No.29-Post-1992 university
30	Executive Director/Director	A1	University	Doer	No.30-Pre-1992 university
31	Executive Director/Director	B2	University	Doer	Interviewee No.31-Pre-1992 university
32	Head/Manager	I	PSRE	Doer	Interviewee No.32-PSRE
33	Head/Manager	C3	PSRE	Doer	Interviewee No.33-PSRE
34	Executive Director/Director	D4	KEO-Other	Doer	Interviewee No.34-KEO-Other
35	Head/Manager	C3	PSRE	Doer	Interviewee No.35-PSRE
36	Executive Director/Director	E5	University	Doer	Interviewee No.36-Post-1992 university
37	Head/Manager	T	University	Doer	Interviewee No.37-Post-1992 university

Appendix G Data analysis: codes and concepts

Appendix G shows the first level codes used on the first part of the analysis and the data and the meta or pattern codes into which the first level codes were grouped and with which they were associated.

First level code	Metacode	
KE defining - knowledge exchange (KE)	M-Scope of KE	M-Dimensions of KE
KE defining - knowledge transfer		
KE defining - other terms used to describe it		
KE scope		
Responsible Innovation		
KE links with research		
KE - continuum with research		
KE Activities		
Collaborative research		
Community engagement		
Consultancy		
Continuing Professional Development (CPD)		
Contract research		
KTPs		
Public engagement		
Student and graduate enterprise		
Tech transfer / IP and commercialisation		
KE Rationale - motives for doing KE	M-KE Drivers	M-Dimensions of KE
Income generation		
Economic growth		
Impact		
KE driver - other		
Co-creation of knowledge		
Government policy		

KE and impact	M-Benefits of KE	M-Dimensions of KE
Societal impact		
Economic impact		
Policy impact		
End user		
Research impact		
Social Responsibility		M-Corporate Social Responsibility
HEIs and social responsibility		
KE and social responsibility		
Stakeholders - Defining and Managing	M-Stakeholders	M-Engagement
HEI stakeholders		
HEI stakeholders and KE stakeholders overlap		
KE stakeholders		
Deciding who to work with	M-Business	M-Engagement
Deciding who to work with – process		
Deciding who to work with - decisions – policy, criteria, or case by case basis		
Environmental & Animals		
Defence including weapons and Nuclear		
Gambling & Prostitution		
Tobacco and smoking		
Pharma		
Third Sector/charity/social enterprise & NHS		
A business	M-Role of KEOs	M-Engagement
Charity		
Civic university		
Good citizens		

Research		
Teaching		
Community / region focus		
Business focused		
Academic ethos and values	M-Academic Ethos	M-Ethical Climate
Academic freedom		
Academic declining to work with an organisation.		
Company - infinite confidentiality		
Company wanting to influence results		
Company wanting veto on publication		
HEIs' values compared with business values		
Key Words and Phrases		
Key phrase - public accountability		
Key word - integrity		
Key word - Credibility		
Key word – Trust		
Key word – Reputation		
Key word – Independence		
Key word – Transparency		
KE organisation values	M-KE Values	M-Ethical Climate
KE organisational culture		
KE practitioner values		
Reference points and guidance		
Ethical expectations	M- Perceptions of Universities	M-Ethical Climate
Ivory tower		
Public good		
Public perception		
Pursuit of knowledge, truth		

Honest broker	272	
Public space		
Universities' other roles		
KE balance	M-Checks and Balances	M-Ethical Climate
Conflicts of interest - declaring and managing		
KE balance - spinouts		
KE balance - contracts		
KE balance - academics' consultancy - managing		
KE check		
Due diligence		
Rules and regulations		
KE governance		
Ethics committee		
Ethical boundary	M-Ethical Boundary	M-Ethical Climate
Danger - personal or political		
Within the scope of or allowed by law		
Do no / minimise harm		
End use		
Duty of care		
Third World		
Ethical issue or concern	M-Ethical Issue	M-Ethical Climate

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