Opening the Black Box of the Health Technology Assessment Process at NICE

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ABSTRACT

The thesis addresses the diversity of concerns to be represented in the calculative practices of clinical efficiency decisions. The empirical site taken is the National Institute for Health and Clinical Excellence (NICE) and its Health Technology Assessment (HTA) process. The HTA process represents many diagnostic areas within one centralised, calculable process. The qualities of calculative practice, which mediate such complexity within one central framework, are explored.

The theoretical lens used to examine the perceptions of calculative practices, from diverse human contributors in HTA, is Actor Network Theory (ANT). In particular, Callon's (1986b) Sociology of Translation is used along with key insights from Latour (1987, 2005). This is underpinned with an interpretative approach to defining calculative practices.

The empirical examination involved observations of HTA meetings and interviews with key actors who were involved in contributing to HTA decision making. The degree of enrolment which human actors had with the NICE HTA black box, was shown to vary with several networking elements. These included diagnostic area, tenure of HTA experience, repertoire of health economics, personality/motivation and inter-contributor dynamics. Findings are presented within these particular issues and are analysed through the four stages of Callon's (1986b) model: problematisation, interessement, enrolment and mobilisation.

Theoretical and empirical contributions are centred on the examination of NICE, using ANT. Accounting's use of ANT is advanced. The thesis contributes to accounting's work within a healthcare context and advances the need to examine calculative practice with a broad and reflexive interpretation as to what constitutes form.

DEDICATION

For Jacqui, who taught me the true meaning of strength and beauty.

For Stuart, who taught me the meaning of integrity and respect.

For Alicia, the brightest star in the sky.

For Bob, loved by the Gingersnap-from-Coventry.

For Flora, Betty, Margaret and Tommy – in loving memory.

For the Table, whose existence has never been successfully determined.

For Craig, who is *everything*.

ACKNOWLEDGEMENTS

First and foremost, I would like to thank Andrea for everything. Your lovely, gentle voice has provided calm and helpful guidance on more occasions than I care to remember. To my wonderful family and friends, I am a far richer person for knowing you all than if I owned all the gold in the world. To all of my wonderful friends and colleagues from my PhD journey, I thank you wholeheartedly. Thank you to David Jack for first encouraging my methodological enquiry. And lastly thank you to the table, whose existence has never been successfully determined.

There are a few points I would like to immortalise. Dad, despite all this, I still cannot remember how to wire a plug or change a light bulb. Oh and big paws, do not large dogs make. Mum and Marion, you are proof that the best things in life really do come in small packages. Stuart, we both know who the man is and who the mouse is. Rachel, no I will not go to the games room with you. Jim, I am hopeful that the leaping gazelle will capture at least one good angle. Craig, you still don't agree with anything I've said, do you?

Some helpful life phrases –

"C.R.A.F.T moment!"
"Fairy snuff!"
"Show me a good loser and I'll show you a loser."
"Lovely biscuits!"
"Will you Google that for me please?"
"Hello Jim!"
"Is it a duck?"
"What's for you won't go by you."

TWO SCENES

A scene from the film Lucy

"**LUCY:** Every cell knows and talks to every other cell. They exchange a thousand bits of information between themselves per second. Cells join together forming a joint web of communication, which in turn forms matter. Cells get together, take on one form, deform, reform — makes no difference, they're all the same. Humans consider themselves unique, so they've rooted their whole theory of existence on their uniqueness. "One" is their unit of "measure" — but it's not. All social systems we've put into place are a mere sketch: "one plus one equals two", that's all we've learned, but one plus one has never equalled two — there are in fact no numbers and no letters, we've codified our existence to bring it down to human size, to make it comprehensible, we've created a scale so we can forget its unfathomable scale." (Besson, 2014)

A scene from the film Men In Black

"AGENT K: Alright kid, here's the deal. At any given time, there are around fifteen hundred aliens on the planet, the majority right here in Manhattan. Most of em' are decent enough, just trying to make a living.

EDWARDS: Cab drivers?

AGENT K: Not as many as you'd think. Humans, for the most part, don't have a clue. They don't want one or need one, either. They're happy. They think they have a good bead on things.

EDWARDS: Why the big secret? People are smart, they can handle it.

AGENT K: A person is smart. People are dumb, panicky dangerous animals and you know it. Fifteen hundred years ago, everybody *knew* the earth was the centre of the universe. Five hundred years ago, everybody *knew* the earth was flat and fifteen minutes ago you *knew* that people were alone on this planet. Imagine what you'll *know* tomorrow.

EDWARDS: So what's the catch?

AGENT K: The catch...the catch is you will sever every human contact. Nobody will ever know you exist, anywhere. Ever." (Sonnenfeld, 1996)

CONTENTS

LIST OF ABBREVIATIONS

ANT = Actor Network Theory
HTA = Health Technology Assessment
ERG = Evidence Review Group
OPP = Obligatory Passage Point
NICE = National Institute for Health and Care Excellence
QALY = Quality Adjusted Life Year
ICER = Incremental Cost Effectiveness Ratio
FAD = Final Appraisal Determination
ACD = Appraisal Consultation Document
DoH = Department of Health
InterTASC ISSG = InterTASC Information Specialists' Sub Group
SMC = Scottish Medicines Consortium

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CHAPTER ONE
THESIS INTRODUCTION

1.1 - Introduction

I have always had a philosophical interest in the differences and similarities which make us human beings. As I progressed through my accounting education, I became fascinated by theorists who proposed that reductive, calculable technologies are borne from social, political and economic circumstances, just as any other idea which has evolved. I am interested in people and how people group together to form institutions. During my accounting studies, I read an article which would prove to become pivotal in directing the course of my PhD. Adam Wishart (2009) wrote about his experiences in trying to make sense of the decisions made during Health Technology Assessment's (hereafter HTA's) at the National Institute for Health and Care Excellence (NICE) (previously the National Institute for Clinical Excellence). I identified personally with many aspects of Wishart's (2009) journey and motivation, particularly the bewilderment of those affected by clinical decision making.

Adam Wishart's work extends to different forms of media. Strongly motivated by a personal journey of witnessing his father enduring a battle with cancer, Wishart (2007) presents an accessible narrative on the advancements made in developing cancer therapies. In 2009, in connection with the BBC, he released a documentary entitled "The Price of Life". The story of those mentioned in the written case study is given more fully. The paradox of health budget rationing and individually based patient demand is keenly felt by the viewer. Wishart (2009) in both film and the case study, follows different participants in the decision making process of a drug called Revlimid. Revlimid, otherwise identified as a health technology, is assessed by the National Institute for Health and Care Excellence (NICE) in a process known as Health Technology Assessment (HTA). Throughout the film and the case study, the viewer is introduced to some of the contentious issues facing HTA decision makers.

1.2 - Health Technology Assessment

With an ever increasing focus on cost manageability within the National Health Service (NHS), the process of HTA details the paradoxical issue of meeting the needs of patients who require complex health technologies. These health technologies can take various forms for example drugs, devices, interventions. The conditions which these patients suffer from can be rare and complex (a rare condition can also be known as an orphan disease (Arenson, 2006)), meaning that the criteria for appraising their effectiveness is also complex.

The contentious issues involved in a resource allocation debate are seen in the context of compelling patient narratives, some of whom suffer from rare, end of life and chronic conditions. HTA decisions are made centrally, by the appraisal committees at NICE. Within a finite healthcare budget, decision makers hear from a diverse range of evidence givers from a process that begins with the scoping of potential appraisals. Potential consultees are sent draft scopes following which a period of review and consultation occurs. A decision is made on whether to formally refer the appraisal or not. The appraisal begins with representatives from key evidence givers and manufacturers. Decision makers hear evidence from multiple groups and can use a "reference case" (NICE, 2013) approach which is guided by both centrally defined criteria and the use of judgement. The decisions made by the appraisal committee are reached from a careful synthesis of multiple forms of evidence and are based on the ultimate determination of a technology's cost and clinical effectiveness. Cost and clinical effectiveness are interrelated in determining a technology's fate within a finite healthcare budget.

The evidence used in determining cost and clinical effectiveness comes from a diverse range of consultees which includes patients and patient representatives, clinical specialists, manufacturers, evidence review groups, among others. The forms which this evidence can take include hearing anecdotal narratives from patients/patient representatives and ratifying cost and clinical effectiveness reports

from the manufacturer. Key aspects of determining cost and clinical effectiveness includes the use of relevant and robust comparator data in evidence.

When I was first learning about HTA, I could see the potential polarisation of methodologies of centrally defined calculative practices, for determining the cost and clinical effectiveness of medical conditions which can vary widely in terms of patient population. In the context of a finite health care budget, my thoughts turned towards the calculative practices used to represent diverse interests. Some conditions are quite rare and the relevant body of knowledge can be lesser than more commonly understood conditions. I thought about the difficulties in maintaining consistency of decision criteria when the reality was that resource allocation in HTA approval could depend on such subjective measures. I felt that there was an issue of fairness to consider, to both the nation which NICE serves and the different patient populations who are advocated for in different technology appraisals. At any one time, anyone from the nation could find out that they are suffering from a rare disease. Adam Wishart (2009) introduces the reader to the complicated nature of putting a monetary value on pharmaceutical research.

A commercial entity, the pharmaceutical company who might pioneer a new treatment for a rare condition, also known as an orphan condition, might inevitably have to heavily recoup research and development costs in the infancy of a treatments availability. The robustness of a technology's efficacy exists in somewhat of a catch twenty two situation. For any technology to be advocated by NICE, it must have rigorous evidence to support its efficacy. If a pioneering technology is for the treatment of an orphan disease, it faces both limitations in the acceptability of peer-reviewed comparators/evidence and the initial recoupment of expensive research and development costs by the pharmaceutical company. Goozner (2004), as interviewed by Wishart (2009) disputes the cost of developing novel technologies, finding that a fifth of the quoted research and development costs would be sufficient to produce new treatments. Aronson (2006) captures the key tensions in both the limitations faced by treatments for orphan diseases and the fairness of having these high costs

being met at the potential sacrifice of patient populations with wider known (and thus potentially lesser priced) treatments: “The tension between equity and affordability is unbearable and pulls in both directions – those with rare diseases deserve to be treated but those with common diseases should not be expected to subsidize them,” (Aronson, 2006: p. 245).

1.3 - HTA and Accounting

NICE (2013) discuss the importance of adopting a consistent approach across different technologies. This involves the use of a reference case approach. There are methodological debates concerning the methods used in HTA; the reference case allows decision makers to make choices that are “essentially value judgements” (NICE. 2013: p. 34). From an accounting perspective, there are comparisons to be made with the methodological debates of health resource allocation frameworks. Within national frameworks, the debate on how to account for resource allocation from a central perspective can become more complex when the focus is on localised resource needs. Methodological differences between centrally devised calculative practices and their implementation at a local level can be seen for example in the literature regarding Diagnosis-Related Groups (DRG).

DRGs are used as a statistical classification system that sorts patients in the context of billing for resource consumption: “DRGs which measure output via the types of inpatients discharged from acute care hospitals,” (Chua, 1994: p. 117). In the context of accounting technologies in healthcare, there are similarities to be witnessed in comparing the methodological variances at a central and local level of DRGs and HTA calculative practices. Themes within the DRG literature include the variability of DRG calculative practices in national frameworks and critiques on the ability of DRG to capture key tensions between clinicians and healthcare managers. The reduction of healthcare complexity within economic rationales is critiqued for example see Samuel et al (2005) and Jarvinen (2009). This gave credence to an

increasing research motivation to explore what I suspected might be contrasting tensions within a healthcare resource allocation debate.

Within the context of HTA, I was considering these issues (that were prompted from my accounting background) and how calculative practices at NICE can centrally navigate healthcare complexity, within the context of a finite budget. Any person, at any time can potentially be an interested party in the appraisal process. As someone who might have a familial tendency towards developing certain conditions, I was motivated to understand both the navigation of healthcare complexity and the success of technology approvals relating to those specific conditions. The diversity of evidence used by HTA decision makers seemed key to understanding how a central organisation like NICE, mediates intense healthcare complexity. The methodology of HTA decision making is outlined in the public sphere through guidance documents and appraisal guides (NICE, 2013), (NICE, 2009a, 2009b).

However, guided by my accounting background, I knew that there was a difference between the mediation of centrally defined frameworks and their application at more localised/specialised levels. In this case, the local level can be taken to mean a lens on a specific health condition. Instead of taking NICE's definitions of calculative practice, I decided to consider the views of those evidence givers who are essential to reaching technology approval decisions, and the committee members who reach these decisions. An important distinction to make at this point is to note the independence of the appraisal committees at NICE from NICE itself. Although they are guided by NICE protocol, they are not precluded from using their own value judgements, for example in the context of the reference case. NICE (2013), state that although the reference case is the "Institute's" preference, that "it does not preclude the Appraisal Committee's consideration of non-reference case analyses if appropriate" (NICE, 2013: p. 34).

1.4 - HTA and Actor Network Theory

The HTA decision process has been the emphasis of the focus in this introduction so far. The final approval decision and the methodology for how it is reached are given by NICE to the public domain. The calculative practices for reaching these final decisions and the diversity of evidence and evidence givers is what is of interest to me. There are multiple perspectives to consider in determining if there is the potential for another account of HTA practice to be heard, this time from the independent decision makers and evidence givers.

At the same time as I was researching NICE, I was developing my understanding of Actor Network Theory (ANT), particularly the Sociology of Translation from Callon (1986b), as the eventual basis for the theoretical framework I would go on to use in the NICE case study. Originating in science and technology studies, ANT is a semiotics based approach to social theory which traces relations between materials and concepts. The status of a material as being a fact is conferred by relations between other materials and concepts. Definitions and the acceptance of facts are traced in ANT studies, to determine the network of relations which create, sustain and reject them. The emphasis of ANT studies is on the *process* of tracing different elements of a network, relative to that observer's particular motivation. Key developers of ANT include Bruno Latour, Michel Callon and John Law.

There are key concepts within ANT which clarify its emphasis on process. Latour (1987) clarifies that the current iteration of a network is the result of previous users' efforts: "Before attributing any special quality to the mind or to the method of people, let us examine first the many ways through which inscriptions are gathered, combined, tied together and sent back," (Latour, 1987: p. 258). The people referred to, exist in relations of materials and semiotics. I found that there were key concepts within ANT which complemented the increasing interest I had for learning about opposing tensions in the HTA debate. These concepts include actors, networks, inscriptions, black boxes and translation. Briefly, actors are those who have an ability to persuade and enrol others that its will is the right path to go along. The only

boundary around the form that the actor might take – whether it be human or non-human – is the ability to act within relations between relevant materials and semiotics. Networks can be seen as assemblages of constituents that come together in reciprocal translations of varying kinds of associations. The actor who wishes to enrol others into their will, will seek to gain control over the network which sustains something as a fact. The network boundary lies at length of network involvement required to sustain the idea that the network perpetuates. If the associations within a network are stable, it can be said that the reality perpetuated in the network has become a black box. The settlement of a controversy, where many elements of a network are made to act as one (Latour, 1987) creates the stability of a black boxed social domain. Elements of the settled controversy now no longer need to be considered. The methods used by challenging dissenters to gain control over the black box take the form of inscriptions. Inscriptions act as devices to rearrange associations within the network that is sought to be black boxed. Inscriptions can mobilise ideals to aid the persuasion of actors within the network. The persuasion of actors within the networks, by a dissenter, through the use of inscription devices is known as the translation of interests towards the new social domain.

In addition to these key concepts, I used Callon's (1986b) Sociology of Translation as part of the theoretical framework for the NICE case study. Briefly, Callon (1986b) proposes that in an instance where someone wishes to challenge the status quo of current knowledge/facts, they undergo four stages of involvement in eventually translating others' interests to their own. These four stages are a) problematisation (introducing the concepts required to change what is indispensable to those necessary to the network) b) interessement (forming the required relationships and fulfilling the right resource requirements to enable you to change the network) c) enrolment (the eventual agreement by those deemed necessary to network changes once new identities and duties have been subsumed) and d) mobilisation (the dissemination of the new status quo by the challenger and those who have now accepted its current iteration as indispensable. The dissenter is seeking to control the black box, and seeks to translate the interests of those within the network by convincing them of the indispensability of the Obligatory Passage Point (OPP) to the

achievement of their goals. The dissenter controls passage through the OPP and defines the identities and duties of those involved in this new iteration of the network.

1.5 – Research Questions

In Figure 1, I have introduced a visual representation of the black-box concept. In itself, this can be argued to be my creation/use of an inscription device. As the thesis progresses, so will the detail of concepts represented through the black box diagram. Initially, Figure 1 shows the focus of my investigation. I have outlined in this introduction, tensions between central HTA decision processes and complex health areas and the wider implication of this in the debate about clinical effectiveness and affordability. The use of subjective practices in reaching HTA decisions for example the reference case, and the mediation of this with how evidence is gathered and assessed is at the centre of the black box within Figure 1. Taking a public account of the NICE methodology from NICE (2013), NICE (2009a,b), I want to understand the process of navigating through these tensions, from the perspective of all those in the HTA network who contribute evidence that is deemed necessary to decision making and by decision makers themselves.

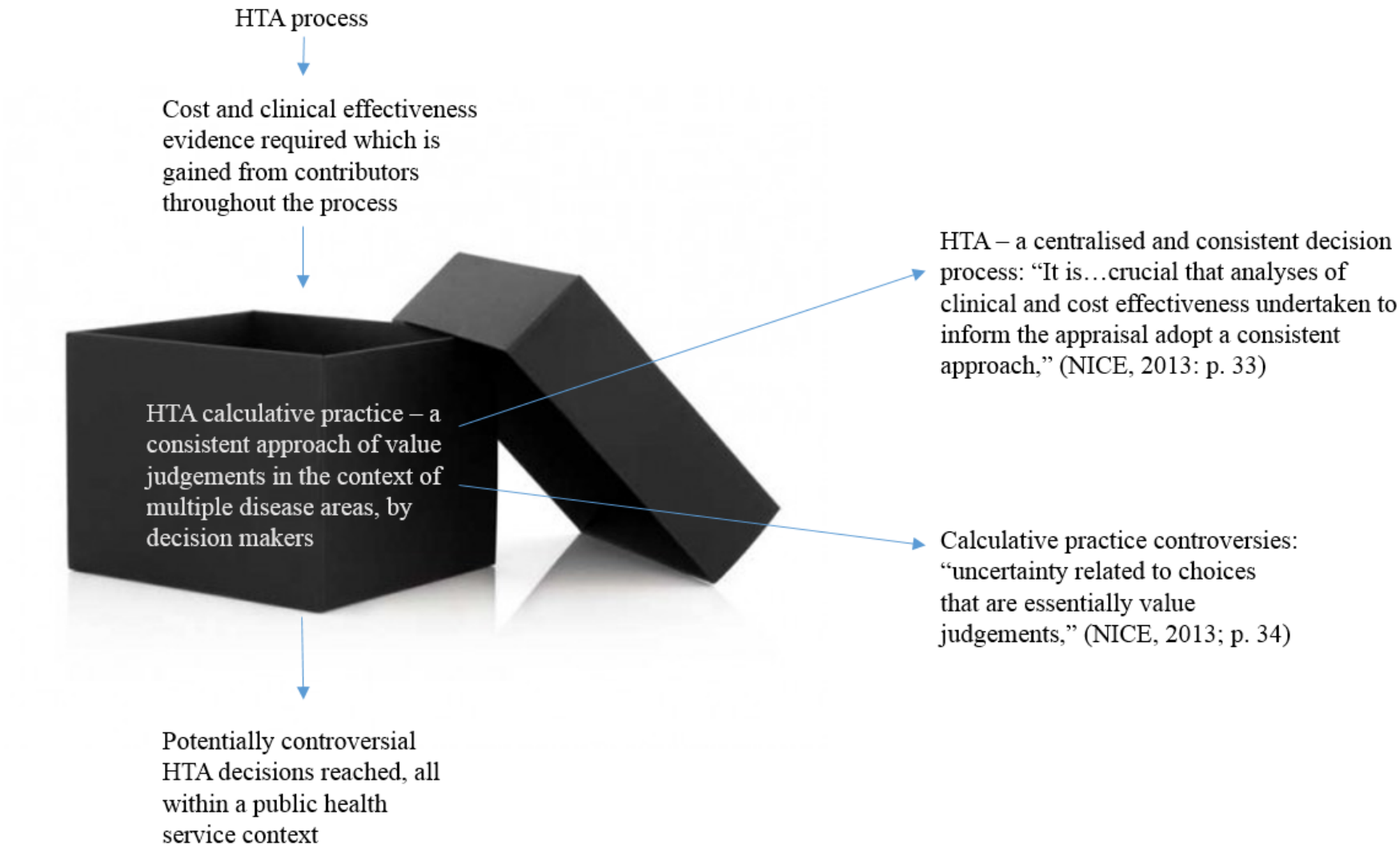
Taking an ANT perspective on things, I argue that the public account of the process – with key roles for participants already outlined – is that which is controlled by NICE. I want to explore the grey area of process which is difficult to capture within multiple healthcare areas. I want to know if the local conditions of different healthcare conditions are factors in HTA process differences. The public account speaks for those decision makers and contributors. Latour (1987) labels this public account as the nth level. By going backwards from this level and "going back to the people in the land" (Latour, 1987: p. 234), I argue that elements of HTA networking are revealed as factors in process differences. I take HTA networking to mean the fulfilment of duties as contributors or decision makers.

This rationale leads me to the first of my two research questions: **what network elements are revealed in speaking directly with HTA contributors and decision makers?** The contents of the black box in Figure 1, which are controlled by NICE, I am seeking to re-open. In ANT terms, I am seeking to reopen the controversy to investigate whether any elements of the HTA process are sacrificed in the public account. I argue that this can only be done by speaking directly with contributors and decision makers.

As I became more familiar with Wishart's body of work, I truly began to see the tensions felt by those affected in the HTA process. Individual patient narratives are compelling; following a patient's life story and the worthwhile contributions they make to society, inevitably make the viewer sympathetic to their case. However, each case is as equally compelling. There are multiple hats to be worn in a conversation about the key tensions within the HTA debate: as a taxpayer, I am concerned about the finite healthcare resources available within the NHS and those allotted to HTA; as someone of a particular age and gender I am concerned about the resources available to me or my family in the case of a dire emergency; as someone who may have a genetic tendency towards breast cancer I am concerned about the resources made available to me if I am unlucky in the future. However, I realise that some of these concerns potentially conflict with one another. I would be more concerned about the calculative practices of one area, at one time in my life, and more concerned about another at a later time in my life. I am motivated to understand the process of decision making, namely the qualities of calculative practice that can balance meeting the diverse needs of patients.

In this first chapter, I have introduced the concerns for accounting technologies within HTA and healthcare in general. Finite public resources coupled with controversy in the calculative practices used in decision making, provide the background tensions for very complex patient demands upon HTA specifically and

Figure 1 - Opening the black box of HTA decision making at NICE



the NHS in general. Advancing upon the ANT conceptual framework and the findings from research question one, there are things to be revealed about decision making and calculative practices. NICE is in control of the public account of how decisions are reached, and are limited in what they can say in terms of reconciling the importance of using consistent approaches in decision making and the need to take reference style approaches to HTAs, which use subjective value judgements. The network elements revealed in speaking directly with HTA contributors and decision makers, takes the detailing of HTA processes back to the people in the land. By approaching analysis at a local level (by speaking to individuals), I can explore how the grey area between centrally managed consistent calculative practices and subject value judgements, which is the justification of the second research question: **what do these network elements reveal about HTA calculative practice at NICE**? The elements of HTA networking which are only revealed at this local level will reveal aspects of the decision making process and HTA calculative practice which exist between the centred power at NICE and the independent power of the appraisal committee to make reference case judgements on individual technologies.

1.6 - Thesis Exposition

The rest of this introduction will outline the contents and purpose of each chapter.

1.6.1 - Chapter Two : Accounting and Healthcare

This chapter establishes the work done by accounting researchers within the empirical boundary of healthcare. A very broad view of healthcare is taken in this chapter. The need for a pragmatic intention by the researcher is advanced. This links the complexity of the clinical setting to the representations of micro healthcare values within macro calculative frameworks. This chapter also introduces the topic of HTA. An overview of the key debates within HTA are given, from a non-accounting perspective. The particulars of HTA at NICE are also outlined.

Three main issues for accounting research in healthcare are identified: the differences between accounting and economic value systems, clinical complexity and the clinical profession's resistance to accounting frameworks. Solutions to these issues are explored, including; the hybridisation of clinical and management professionals into one role, accounting for clinical complexity and the difficulties inherent in representing local healthcare values within wider frameworks. These general themes are applied to the Diagnosis Related Group (hereafter DRG) literature, to highlight the similarities of issues faced with accounting framework development in the context of HTA's. Variability of DRG framework calculative practices is used to support further arguments in HTA variability.

1.6.2 - Chapter Three: Framing Accounting and Healthcare with ANT

This chapter extends the three issues identified from Chapter One. The question of how to conduct a study into the variability of centralised HTA calculative practices begins with a review of Actor Network Theory (hereafter ANT). ANT studies from both accounting and healthcare literature are reviewed.

Core principles of ANT are outlined including; actors, the Obligatory Passage Point (hereafter OPP), black boxes, translation, inscription and networks. Theoretical framework points are taken from Latour (1987, 2005) and Callon (1986b). Callon's (1986) four stages of translation (problematisation, interessement, enrolment and mobilisation) are outlined and used as the structural basis for the conceptual framework employed in this thesis.

Key advice for the conducting of an ANT account is taken from accounting and healthcare studies which use ANT. Issues include using reflexive interpretations of calculative practice, the timeliness of studies, the institutional values of clinicians and the complexity of healthcare boundaries.

1.6.3 - Chapter Four: Methods and Methodology Chapter

This chapter outlines the core methodological principles that are applied to the definitions of accounting used in this thesis. A multiplicity of values, attached to accounting models, is given preference over a singular financial language. The strengths and weaknesses of the case study method are addressed.

The primary data recruitment process for the HTA case study is then discussed. The full collection of evidence is given to include HTA meeting observations, attendance at a patient conference, interviews with contributors and decision makers and background reading of NICE appraisal methodologies. The chapter then goes onto discuss the manual coding process of the interviewee transcripts.

1.6.4 - Chapter Five: Findings and Analysis

This chapter presents the main findings from the HTA case study. The first part of the chapter gives an overview of the HTA function. The materiality of who is involved and the calculative practices used are explained in relation to the theoretical framework points outlined in the earlier chapters.

The second part of the chapter presents the findings from "going back to the people in the land" (Latour, 1987: p 234), about the contents of the black box of the HTA process. The presentation of evidence comes mostly from key personal observations and interviewee findings from patient representatives, clinical experts, manufacturers, Evidence Review Groups (hereafter ERGs) and appraisal decision makers (committee members, vice chairs and chairs). Five main elements of HTA networking are identified as the variable parts of HTA contribution/decision making. These include; diagnostic area, personal qualities and motivations, repertoire of health economics, tenure of HTA contribution/decision making and other contributor dynamics. The findings of the NICE case study are structured around these five networking elements.

1.6.5 - Chapter Six: Discussion – A Translation of the HTA process at NICE

This chapter extends the analysis of the HTA case study findings. The four stages of Callon's (1986b) four stage sociology of translation are applied to the findings. The question of the indispensability of the NICE black box is, to those interviewed, established through the variability of the five identified networking elements. The first research question - **what network elements are revealed in speaking directly with HTA contributors and decision makers?** - is answered and clarified. The latter part of the chapter addresses the second research question - **what do these network elements reveal about HTA calculative practices at NICE?** The variable qualities of calculative practice given by different interviewees are outlined and linked thoroughly with similar points made in the accounting and healthcare literature. The level of enrolment which actors have to NICE calculative practice is considered in the ways they have translated their duties and the resulting variable networking elements

1.6.6 - Chapter Seven: Conclusions, Contributions and Future Research

This chapter concludes the thesis and establishes the main empirical and theoretical advancements made. The complexity of the empirical site advances various ANT techniques and core principles while it also answers calls for contextually technical work from the accounting literature. This chapter reflects on the issue of boundaries within complex clinical settings. Matching this is an equal need to interpret calculative practice reflexively. The journey taken in following the actors is established as an empirical advancement. Career progression within healthcare is discussed, particularly within the context of maintaining links with the rich HTA network established throughout fieldwork.

CHAPTER TWO
ACCOUNTING ISSUES AND TECHNOLOGIES IN HEALTHCARE

2.1 - Introduction

In the introduction, I detailed my motivation to investigate the people involved and represented in the Health Technology Assessment (hereafter HTA) process at the National Institute for Health and Care Excellence (hereafter NICE). The thesis examines the representation of multiple healthcare players and their interests, in accounting practices, specifically the HTA process. In this chapter, I give an overview of HTA literature and also of the HTA process at NICE. The potential for accounting technologies to be sensitive to clinical complexity is a driving research enquiry to be examined in review of the accounting literature relating to healthcare settings. To make a clear boundary, I include within the remit of healthcare, literature which broadly encompasses national bodies of healthcare resource allocation. This literature includes healthcare empirical sites from different countries. It should also be recognised that healthcare is one of the most prominent empirical sites for accounting studies. The issues identified in this chapter are relevant to this thesis but are by no means exhaustive of the areas of scholarly contribution in accounting and healthcare studies.

I begin with a review of literature which corroborates the main issues I have identified for accounting framework development within the healthcare setting; different value systems, the dangers of reducing or conflating the clinical profession, the clinical professions' resistance. These thematised points are taken as important concerns regarding accounting and healthcare. The relevance of these concerns is shown in their application to Diagnosis Related Group's (hereafter DRGs). The three issues, in the context of DRGs, are discussed with respect of assumed similarities between this literature and expected concerns with the calculative practices of HTA's. There is prevalence for DRG systems to have local interests/circumstances

missing from decision making processes, often resulting in variable national calculative policies for example see Ernst and Szczesny (2005), Forgoine et al (2005) and Gaal (2006). A broad interpretation of calculative practice in the HTA case study findings is justified in light of the diversity of healthcare players.

2.2 – The Health Technology Assessment (HTA) Process and the National Institute for Health and Care Excellence (NICE)

In this section, an overview of HTA is given. The HTA process at NICE is contextualised. This is necessary in order to provide the required contextual information which validates the HTA tensions described in chapter one and the eventual answering of research question one: what network elements are revealed in speaking directly with HTA contributors and decision makers?

2.2.1 – Who are NICE?

The National Institute for Health and Care Excellence (NICE) was founded in 1999 as the National Institute for Clinical Excellence. Its original remit was to "reduce variation in the availability and quality of NHS treatments and care" (NICE, 2013). As of April 2013 it has been accorded the legislative status of a Non Departmental Public Body (NDPB) by virtue of the Health and Social Care Act 2012 and although it is accountable to its sponsor (The Department of Health), it is independent of government. The NICE Charter (NICE, 2013) discusses the core functions and principles of the organisation to include the development of national guidance/standards and also to act as an informative resource on how to give high quality health/social care and preventing/treating ill health. The wide array of activities which NICE undertakes to fulfil the remit of improving "outcomes for people using the NHS and other public health and social care services" (NICE, 2013), include:

- The production of evidence based guidance and advice, which can take the form of clinical guidelines, technology appraisals, social care guidance, interventional procedures and public health guidance.

- The continual strive for the appropriate quality standards and other performance metrics such as the Quality Outcomes Framework (QOF), an annual agenda to search for potential criteria indicators in working with General Practitioners (GPs).

- The commissioning of information services for health and social care professionals such as NICE Evidence (an online search engine for related health data).

2.2.2 – What is the HTA process?

The HTA process is part of NICE's remit concerning the production of evidence based guidance and advice, for application to the population of England, UK. It establishes the cost and clinical effectiveness of new and established health technologies (NICE, 2013). This guidance provides referrals for whether or not the NHS will fund the cost of the technology in patient treatment[1]. NICE is only one example of an organisation which makes national HTA decisions. Similar organisations include the Scottish Medicines Consortium (SMC), which makes decisions for Scotland. In Wales, HTA decisions are made by the All Wales Medicines Strategy Group (AWMSG).

The majority of potential topics that could be considered for future appraisals come from the National Institute for Health Research (NIHR) Horizon Scanning Centre

[1] For the purposes of clarity, the referral by the Appraisal Committee does not extend to directions on funding arrangements at the local level for the health commissioners who are impacted by these decisions: 'The National Institute for Health and Care Excellence (Constitution and Functions) and the Health and Social Care Information Centre (Functions) Regulations 2013 require clinical commissioning groups, NHS England and, with respect to their public health functions, local authorities to comply with NICE technology appraisal recommendations that recommend the relevant health service body provide funding within the period specified.' (NICE, 2013:pp 15)

(NICE, 2013). The selection of topics which NICE might consider are filtered through a standard selection process in as expedient a manner as possible, to ensure fair representation. Some topics might not be considered if they are very similar to ones that have previously been considered and eliminated or are similar to current/recent/in progress guidance. Topics will not qualify for consideration if there are no significant health benefits, significant changes in price or appropriate evidence bases (NICE, 2013). Other sources of potential topics come from NHS commissioners, Department of Health (DoH) policy teams or individual health care professionals.

The definitive referrals for technologies are made by the DoH, with the overarching remit to provide guidance to Secretary of State as to the health benefits/cost and to make assessed recommendations to NHS England and Wales (NICE, 2013). These can include; medicinal products, medical devices, diagnostic techniques, surgical procedures, therapeutic technologies, systems of care and screening tools (NICE, 2013). The contexts in which the technology is assessed can include such themes as; the holistic significance of proposed health benefits to the relevant patient population and the corresponding holistic costs to the NHS, the significance of the technologies ability to impact other health-related government policies (the example NICE give is a reduction in health inequalities) and the added value of centralised guidance as opposed to more localised technology assessment that could cause controversy (NICE, 2013).

There are four potential recommendations that NICE can give, although a technology can have more than one recommendation; recommended, optimised, only in research and not recommended. The final decision which is made is published in several different ways and NICE infer an intended audience for each level of technical document produced; the full version (a format suited to implantation by health professionals and NHS bodies), the quick reference guide (a presentation of recommendations in a suitable format for health professionals) and information for the public (written in suitable language for people without specialist knowledge) (NICE, 2013).

There are two types of appraisal process, Single Technology Appraisal (STA) and Multiple Technology Appraisal (MTA). An MTA can be distinguished as either the appraisal of more than one technology or of one technology across a broad set of indications. NICE clarifies that although there are procedural differences between the two processes, the "principles relating to decision-making, the methods of assessment and the decision outcomes are consistent," (NICE, 2013: pp 10). Figure 9 highlights the appraisal committee recommendations since NICE began in 1999. NICE (2015) also provides a link to a document containing of all health technology recommendations made, in more detail.

Figure 2 – Showing NICE recommendations (NICE, 2015)

1 March 2000 to 31 October 2015			
Recommendation categories	**Single Technology Appraisal**	**Multiple Technology Appraisal**	**Total**
Recommended	107 (58%)	248 (64%)	355 (62%)
Optimised	34 (18%)	71 (19%)	105 (18%)
Only in Research	4 (2%)	22 (6%)	26 (5%)
Not Recommended	41 (22%)	44 (11%)	85 (15%)
Tot			

The basic process of HTA process can be summed up in three phases: scoping, assessment and appraisal.

Scoping is the initial stage during which NICE will consider the remit of the technology and draw the boundary around what are relevant questions for example population of patients, the correct comparators to that technology. The identification of the driving issues of health and cost analysis is vital to the assessment process. NICE states that a certain level of contextual knowledge is necessary to truly determine these driving issues, thus relevant consultees and commentators are invited

to participate, with the remit adjusted to pertinent comments accordingly. Figure 3 shows a diagrammatic flow of the scoping process.

Figure 1 Steps in developing the scope

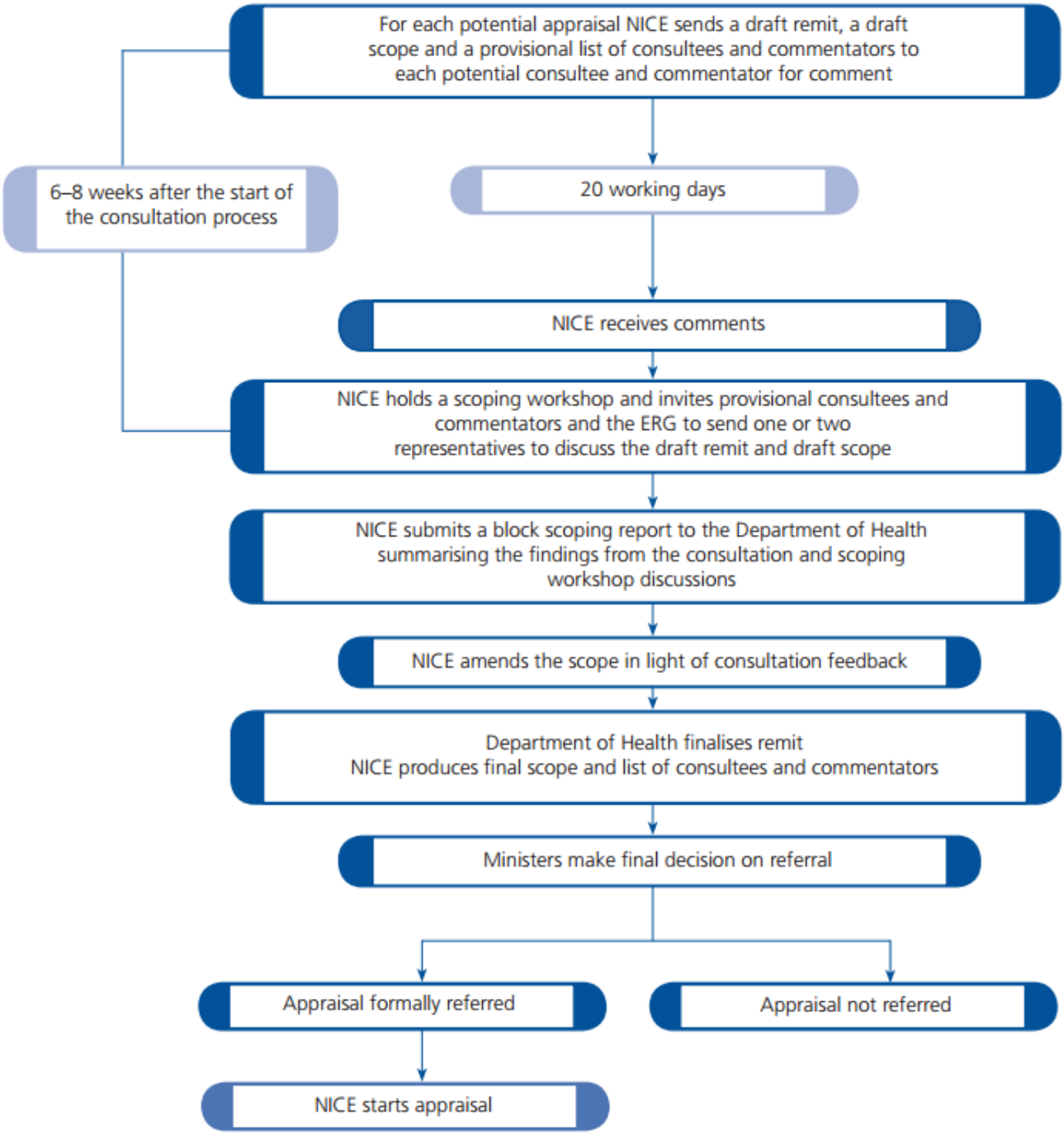


Figure 3 - Showing steps in the flow of the scoping process at NICE (2009a: p. 16)

Assessment of the technology involves a systematic and comprehensive evaluation of relevant evidence, with the clarified aim being to "assess a technology's clinical and cost effectiveness for a specific indication, taking account of uncertainty, compared with the appropriate comparator(s) listed in the scope," (NICE, 2013: pp. 13). Assessment consists of an economic evaluation and a systematic review of all clinically related evidence, where gaps in current knowledge are identified by an independent academic group which for MTA's is called the Assessment Group (who conduct the economic analysis and systematic review) and for STA's is known as the Evidence Review Group (hereafter ERG) (who critique/review the manufacturers submission).

Appraisals are conducted using the information generated during the assessment phase, congruent to evidence submitted by consultees, commentators, clinical specialists, patient experts and commissioning experts. The decision is made by the Appraisal Committee based on this evidence, making judgements on varying factors (NICE, 2013). Figure 4 shows a diagrammatic flow of the appraisal process[2].

[2] For the extent of this case-study's boundary, the diagram shows the process up to and including the networking of those who appear at appraisal meetings. The original source diagram includes further details covering the process of publishing the FAD, appeals et cetera.

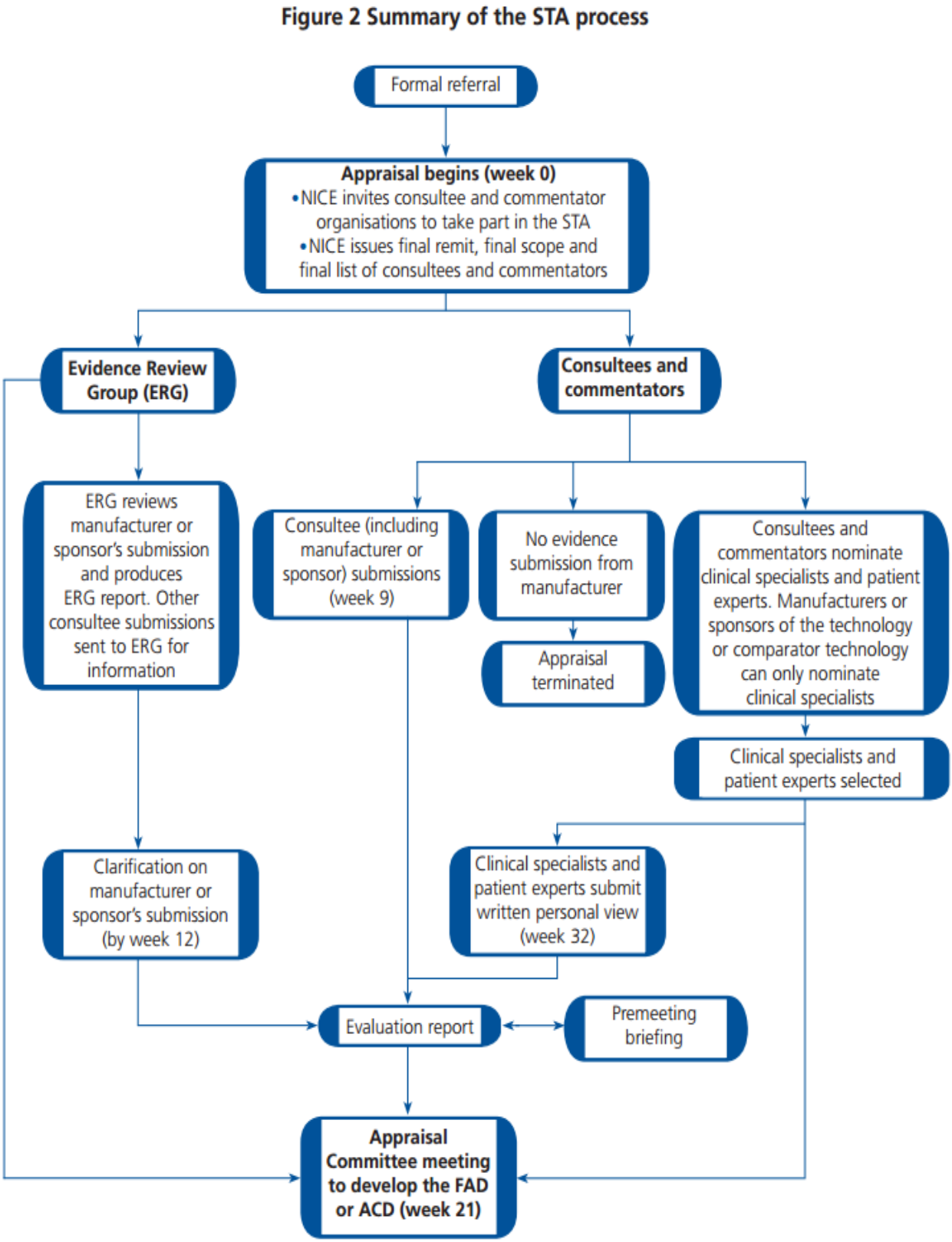


Figure 4 - Showing steps in the flow of the appraisal process at NICE (2009b: p. 20)

2.3 – A Non-Accounting Critique on HTA

In this section, themes and critiques relating to both HTA and healthcare resource allocation are discussed. The discussion in this section is from a clinical audience. There is a large body of research regarding HTA, but I have chosen to focus on research relating to the issues which have motivated the investigation; central calculative practices which mediate healthcare complexity and finite healthcare resources. This discussion is not exhaustive but provides context from a non-accounting perspective which validates these issues.

Taylor and Taylor (2009) defined HTA as "a multidisciplinary activity that systematically examines the safety, clinical efficacy and effectiveness, cost, cost-effectiveness, organisational implications, social consequences, legal and ethical considerations of the application of a health technology – usually a drug, medical device or clinical/surgical procedure," (Taylor and Taylor, 2009: p. 1). They discuss THE ability of HTA to act as a "bridge between evidence and policy-making" (Taylor and Taylor, 2009: p. 2). The authors confirm the mandatory status of NICE decisions within England and Wales.

HTA debates include commentary from clinical audiences, some of which are not involved in the HTA process at NICE. Arellano et al (2011) conducted an exploratory study into the perceptions of ethical considerations within HTA decision making. Using quantitative survey methods, the authors questioned a targeted audience of authors who had published in the International Journal of Technology Assessment in Health Care (IJTAHC) between 2005-2007. The authors found that what respondents agreed about the most was that ethical considerations of a technology decision should include questioning the economic impact on society, of that decision. The justification for making a decision is often dependent upon technical expression/arguments. The ambiguities of issues which are not able to be expressed thusly, such as moral inquiry, are often avoided.

Hoffmann (2008) also contributes to the issue of ethics and HTA. He emphasises the key tensions of HTA decisions within a healthcare resource allocation debate. HTAs are morally challenging, value-laden and dependent upon scientific and technical rigour. HTA is seen as problematic, because once the issue of ethics is addressed, moral questions are raised and definition consensus is hard to reach: "arguments for "integrating ethics in HTA" strongly depend on what is meant by "integrating", "ethics", and "HTA"...although professional, methodological and heuristic values are most apparent and dominating, the HTA enterprise is based on moral values and the goal of making people's life better. Trying to escape this affinity between ethics and HTA (assessment or appraisal) can cause serious challenges: values inevitably follow any attempts to help people," (Hoffman, 2008: p. 427).

Leggett et al (2012) explored the topic of Health Technology Reassessment (HTR). HTR is defined as a "structured, evidence-based assessment of the medical, social, ethical, and economic effects of a technology, currently used within the healthcare system, to inform optimal use of that technology in comparison to its alternatives," (Leggett et al, 2012: p. 220). They identify different national approaches to HTR, although advise that HTR is in its infancy as a healthcare decision making tool. National systems examined include Australia, Denmark, Norway, Scotland, England, Spain, Sweden, United States and Canada. Clifford (2011) found that a review of sixty HTA agencies around the world did not adopt gender-specific issues in their priority setting processes. The author considers this in contrast with the recognition that gender is a social determinant of health (Clifford, 2011).

Clark and Weale (2012) explore the issue of social values in priority setting decisions by healthcare groups. While not specifically about the HTA process, Clark and Weale's (2012) points are valid in the context of how NICE contributors and decision makers' perceptions might add context to the values represented at a central level (the public account) and the more complex local level (particular healthcare areas). They link ethical justification to the resource allocation debate, stating that such justification is made using social values. They have identified process values (transparency, accountability and participation) and content values (clinical

effectiveness, cost effectiveness, justice/equity, solidarity and autonomy) which they argue are present in any healthcare system. The use of Quality Adjusted Life Years (hereafter QALYs) is particularly emphasised in terms of social value judgements. The supposed benefits of QALYs as a decision making criteria include the impartiality they allow clinicians, making it easier to make decisions about resource allocation between different conditions and patient circumstances. It provides a standard that can be expressed for multiple conditions. However, Clark and Weale (2012) outline the controversies surrounding QALYs as a rationing technology, in the context of social judgements. QALYs incorporate subjective perceptions of health states from patient populations, where being asked about the reality of having a condition and its impact is potentially different in each case. Societal benchmarks of well-being and what constitutes a severe burden can influence both patient testimony (which informs QALYs) and the decision makers. Cultural associations with particular diseases (the localised HTA setting) for example cancer, might influence decision makers priority setting because they might think they have a strong understanding of the condition. Finally, the issue of need is also a subjective controversy associated with QALYs. What people think they might need is a different issue as to how a finite health budget can assist individuals with healthcare improvements for example some might see cosmetic enhancement as much as their need as others might see treatment for cancer.

Lehoux and Williams-Jones (2007) consider the issues involved in integrating social and ethical issues in HTA. They find that there are three methodological approaches to implementing such integration. These include getting help from experienced bioethicists and social scientists, conducting qualitative/quantitative primary research and then follow up research which incorporates literature on social and ethical issues (Lehoux and William Jones, 2007). A particular theme from the paper is on the impact of cultural associations on ethical attitudes in HTA. The strength of public attitudes and experiences influences the values attached to different diagnostic areas. Technical evidence is weighted by some in regards to these values. This is potentially problematic for a process which is defined by the rigour of evidence used in decision making:

> "because moral issues and ethical dilemmas "tend to work well in the public debate" and may more easily attract media attention when also compared with, or supported by, "hard evidence" in the form of numbers and statistics, further research could explore the interface between public expectations, values, and HTA-based decision making. Rationing access to technologies that have not been clearly proven harmful or ineffective are common triggers for strong public reaction. The uptake of HTA's conclusions in this case largely depends upon the way policy makers position their policies around public expectations. Thus there is need for a much better understanding of how values support and/or contradict HTA's conclusions." (Lehoux and Williams-Jones, 2007: p. 15)

There are conflicting tensions in HTA decision making, within an ethical framework context. Using consistent criteria like QALYs, which is argued to provide uniform weighting between conditions, makes national decision making fairer in the context of a finite health budget. However, as this literature suggests, HTA decision making also requires subjective decision making which reflects the heterogeneous impact of cultural associations within different diagnostic areas. Healthcare complexity does not simply mean a difference between conditions. Some conditions are chronic, and some conditions do not affect life expectancy. Some conditions do, treatments for which are known as end of life. The concept of social values is relevant here for example how HTA processes capture the value placed on end of life treatments as opposed to chronic conditions.

Round (2012) examines this issue in looking at end of life QALYs. A recurring theme in literature which discusses ethics and social value judgements in HTA is of the limitations which technical and scientific processes have for what are essentially decisions made to benefit people. People attach different values to life. Round (2012) makes the case that end of life QALYs, which provide a common measure between people, lose the perceived benefit of creating uniformity for decision makers. The subjective judgements involved in attaching values for patients with end of life conditions involve asking empirical questions about death. Such research directions

can be considered abstract. Round (2012) effectively captures the difficult role of HTA decision makers.

> "Although the arguments against the QALY for use in end of life care are numerous, there still exists no viable proposed alternative way of measuring health benefits for the purposes of resource allocation decision making. Even if it were accepted that the QALY was not suitable, the needs of decision makers would still exist. Any proposed replacement measure would have to share many of the attributes of the QALY. Crucially, it would need to be suitable for the comparison of the opportunity cost of competing demands for resources and would thus need to be compatible with the QALY or provide a wholesale alternative for use across all healthcare evaluation," (Round, 2012: p. 526)

Within the context of a finite healthcare budget and a diverse nation of taxpayers which funds the NHS, healthcare managers are responsible for using those funds wisely. However, meeting the needs of the nation means that some patients will have occasional use for the system and others will have more complex healthcare conditions which require greater resource allocation. HTA exists because such decisions need to be made. There is an understandable lure of limiting such decisions to the use of technical and scientific processes, to ensure maximum clinical and cost effectiveness is achieved. However, the benefit sought from making effectiveness decisions is a reflection of diverse social value judgements from a nation with complex expectations and assumptions of resource allocation from the NHS.

Harris (2005) also critiques the issue of QALYs, with particular reference to NICE's use of the measure and a 2005 proposal to deny dementia sufferers to the only treatment there was for it, at the time of publishing. Harris (2005) underscores the expectations of measures used to achieve the best possible output for finite healthcare resources. Harris (2005) states that NICE found that treatments were clinically effective, and asserted that the decision to not approve access to treatment was therefore a reflection of cost ineffectiveness in treating this patient population. Harris (2005) goes onto present a perspective on the morality of healthcare judgements. Decisions made on QALYs perpetrate discrimination in respect of some

factor. Harris (2005) logically follows through in showing contradictory statements NICE has made regarding discrimination of age and ethnicity. He finds that through contradictory statements regarding methodology, NICE is guilty of evaluating patients as opposed to treatments. The equality of an individual's claims on a community is a strong part of Harris' critique.

Referencing Harris' (2005) work, Paulden and Culyer (2010) address concerns that the use of QALYs in decisions relating to patients with a short life expectancy is discriminatory. They generally find that Harris' (2005) assertions are difficult to justify. Taking what they describe as a "simple model of NICE's decision making setting" (Paulden and Culyer, 2010: p. 9), conditions to be met for any possible discrimination are described but juxtaposed against the appraisal committee's discretionary powers. Taking into account end-of-life decision making, Paulden and Culyer (2010) suggest that NICE guidance may discriminate against patients with a longer life expectancy. They find that age related discrimination is neither "inherent or inevitable" (Paulden and Culyer, 2010: p. 9).

Littlejohns et al (2012) confirms that the recognition of value judgements is necessary, because sometimes the technical evidence is not always rigorous enough. In reference to NICE, they overview the efforts made to blend scientific arguments and social value judgements. The HTA process is embedded with several core values; scientific rigour, inclusiveness, transparency, independency, challenge, review, support for implementation and timeliness (Littlejohns et al, 2012). The decision process is supported by social value judgements which are presented in "The Social Value Principles" (NICE, 2008).

Facey et al (2011) explored the issues in validating patient testimony. HTA processes often undervalue or under-represent the expression of patient evidence, despite the HTA decision ultimately being made in respect of patients. The authors present the somewhat conflicting issues of the need for rigour in all evidence used in HTA and the perception of patient testimony as subjective. They praise the SMC for their due process mechanisms with patient organisations. A concern from patient groups is that

their participation is rote. Facey et al (2011) identify several steps which may be of help in ensuring that patient representation is built in rigorously to an HTA process.

> "The quality of the deliberative process relies on participants' ability to contribute competently, and on the establishment of "fair deliberation" procedures...Early involvement, training (e.g., about the process, technical language used in HTA, and topic under discussion), the choice of an appropriate participation method and support from HTA organisations, which provides impartial moderation that facilitates mutual respect and opportunity for participation between participants, may help to ensure that patients contribute meaningfully to the HTA process and output." (Facey et al, 2011: p. 338)

Several of these suggestions recur thematically in later chapters as evidence from patient representatives from the NICE case study. Facey et al (2011) go on to state that although more has been done in recent years to capture the patient voice in HTA processes, that it is still not enough. They recommend going beyond a cost/clinical effectiveness reality and advancing the use of patient-focused sections within HTA processes.

This section has shown that there are key tensions within HTA literature concerning the calculative practice formation of HTA decision making. Centrally managed calculative practices, particularly QALYs are challenged at the local level of decision making. Subjective value judgements are both problematic in terms of technical decision processes and essential as part of wider health benefit and moral debates. The constituency and qualities of calculative practice, from a non-accounting perspective are important for both following the three principles described later in this chapter and for understanding the semiotics of NICE specific processes. It is essential to gain a contextual understanding of these issues in order to answer research question two: what do these network elements reveal about HTA calculative practice at NICE?

2.4 – Representing Values in Healthcare

This section discusses the issues surrounding the interaction of different value systems in centralised healthcare systems. The conflict between accounting and economic values is established for example conflicts between accounting and welfare economics. The importance of considering context in relation to the expression of these values is addressed.

Seminal earlier accounting papers emphasised the importance of considering the social circumstances of the accounting technology. To understand the sustainability of an accounting system, perspectives of accounting from healthcare players should be considered in relation to boundaries such as organisation/profession/institution. Napahiet (1988) found that the impact of new accounting developments was dependent on the relationship between the realities represented in calculations as opposed to that gained from everyday experiences. Covaleski et al (1993) found that the internalisation of cost-mix accounting systems was an ongoing process and could be transformed by organisational actors. Lawrence et al (1994) emphasised that accounting systems were deeply connected to the contexts which created them to serve. The apparent success of the internalisation of accounting systems by healthcare players should be considered in terms of contextually flowing frames of reference, an assumption supported by this thesis.

Key findings from Broadbent et al's (2008) examination of key elements of PFI decision making within the British NHS support a broadly constitutive form of calculative practice in the HTA case study. Citing Burchell et al (1980), they examined a total of seventeen PFI cases and found that quantitative risk estimation was the dominant mode of decision making tool. Calculative practice was foremost embedded with an accounting logic that did not privilege qualitative uncertainties.

> "...risk estimation technologies for decision-making, including those for PFI, are driven by accounting logic. In this context accounting is particularly being used in its role as an 'ammunition machine' (Burchell et al., 1980). Moreover, and of key importance, is the point

> that the use of accounting technologies has a constraining influence. In every case that we investigated, major professional firms of accountants or their associated consulting companies were hired to provide assistance with the estimation of the costs and risks for the PSC—particularly the estimation of transferred risks. They use models that are adaptations of other more general forms of cost and risk estimation they have developed for use in different decision situations. Put simply the nature of these estimation processes is accounting driven and accounting determined. The outcome of the processes is limited by what constitutes and is acceptable as knowledge as defined by accounting logic...The dominance of the accounting-led approaches leads to a reduction in the importance of taking into account other uncertainties, which cannot be made subject to measurement technologies in pre-decision processes." (Broadbent et al, 2008: p. 71).

The adaptive models are shown to be rigid by an inflexible accounting logic. The rich and complicated context of a healthcare setting, even in a general sense, must be considered by the accounting researcher. Without approaching the conflict of differing efficiency definitions between the economics and accounting disciplines, the inflexibility of the healthcare allocation tools will not reflect the sensitivity of the clinical setting.

Arnold et al (1994), using discourse analysis, examined the effects of extending an understanding of "health care costs" (Arnold et al, 1994: p. 51) to a public sphere, as opposed to technical spheres. Ascribing their search phrase of health care costs as "multi-accentual" (Arnold et al, 1994: p. 63), the authors found that meanings behind the phrase varied with context and discursive formation. Linking the idea of context with accounting and economic values, they go on to state;

> "The logic of markets constitutes such a set of rules or "system of linguistic relations", in which the expression health care costs takes on a meaning compatible with the practices of commodification, market valuation and rationing. But the cost of sustaining a life takes on different and conflicting meaning when the expression is transported to the discursive formation we use to talk about our social and human relations – as writers, taxpayers, community volunteers and family members," (Arnold et al, 1994: p. 63)

Several links are made to considerations for the HTA case study; the multiple healthcare players are acting as representatives for a certain patient population. Public opinion, knowledge and understanding of the diagnostic area are viable concerns for both the choice of representative and how they represent relevant issues for example it might be assumed that an HTA technology that is related to a form of life threatening cancer might differ in the experiences of representation (by interviewing those involved) of someone representing a chronic, non-life threatening condition.

Mogyorosy and Smith (2005) produced a research monograph which examined the main methodological considerations for costing healthcare services. While being largely a technical research piece, they do comment on the fundamental differences between economic and accounting measurement principles:

> *"*The economic evaluation of health service costs is based on welfare economics, which is concerned with the impact of any changes on the total welfare of the society. Therefore, costing methodologies based on welfare economics try to assess the impact of any decisions (changes) from a societal perspective...On the other hand, accountants are usually assessing decisions from a particular organization's perspective. As a consequence, accountants define and measure costs more or less differently. As a result, mainly due to differences in perspectives, as well as the decision problems to be solved, economists and accountants could apply different costing methodologies, which show significant differences in all the major steps of costing (identification, measurement and valuation of resource use)", (Mogyorosy and Smith, 2005: p. 20).

The authors find the focus of accounting research to be within a boundary. Their description of economic value infers a strongly central value system. In the HTA study, part of the challenge is explaining to societal players (entire public) that this central decision process governs multiple boundaries of perspective.

Stewart (2005) conceptualises the "iatrogenic disorder" (Stewart, 2005: p. 4) that has resulted from an accounting-centric healthcare framework. In the context of the New

Zealand healthcare sector, Stewart (2005) traces the history of healthcare reforms. The assumptions of a marketised healthcare framework are reversed. Citing Chua (1993) and Chua and Preston (1994), Stewart (2005) emphasizes the socially manufactured nature of costs and revenues and the consequences that seemingly objective accounting inscriptions have the reality of what is reported. Stewart (2005) argues for awareness about the fundamental values attached to the dominant ideology and the intersections with the clinical context.

Mathaisel and Comm (2014) found that research about the sustainability of the US healthcare system, had so far been limited to cost accounting. They present a strategy for rethinking sustainability in the context of its having five abilities; availability, dependability, capability, affordability and marketability. These are interpreted as essential values which should be represented by accounting in healthcare.

Cordery et al (2010)[3] examined the discharge of holistic accountability in Primary Health Organisations (PHO's) in the New Zealand public sector. Their findings suggest that a profit-oriented attitude results in the operation of a model which focuses on GPs as opposed to the communities. They find this in line with Abel et al (2005). The relationship between funders and providers was characterised by a reluctance to move away from market-based models and disengagement with wider stakeholders which include groups such as funders, healthcare providers, patients and communities. The diversity of values held by stakeholders is not constrained by an assumed desire for profitability. Profit oriented values and measurement instruments could potentially stymie the expression of multiple interests in such a detailed process as HTA.

[3] The work of Cordery et al (2010), Lapsley (1997), Llewellyn (1997), Ellwood (1997), Llewellyn and Grant (1996), Fischbacher and Francis (1998), Jacobs and Barnett (1996) and Broadbent et al (2001) is of relevance to the move from NICE's mandated power to that of Value Based Pricing. The move from centralised mandatory guidance to more localised decision making within Primary Care Trusts (PCTs) would potentially be an empirical site to revisit in the future, contributing to similar work by the above authors.

2.5 – Healthcare Complexity

The values represented by accounting in healthcare are problematic. Values are both societal (for example cost efficiency in a public health budget) and locally specific (for example variable allocation needs of different health institutions, costing implications of rare medical conditions). Inherent to the healthcare setting is the issue of clinical complexity. The accounting system must not conflate or reduce specific clinical complexity, whilst at the same time be representative of a societal imperative for cost efficiency in a public budget. The differences between accounting and economic measurement principles, within healthcare contexts, was discussed in the previous section. The importance of looking at these in the context of healthcare is important, as healthcare complexities offer a challenging empirical site for potentially reductive measurement principles. In this section, awareness for this richness and complexity is developed.

When faced with a societal value, a question of where the boundary lines must be considered. In a discussion of clinical complexity, clarification of boundary is important for example when discussing national and local resource allocation and specialist/institutional clinical knowledge. The range of empirical sites for accounting studies in healthcare is broadly taken. While some studies make clear that the research was conducted within hospitals for example Scarparo (2006) other studies can be more localised (in setting and diagnostic area) for example Arnabolidi and Lapsley's (2005) site of a Regional Blood Transfusion Service (hereafter RBTS), Hanlon et al's (2006) site of NHS Direct, Goddard and Powell's (1994) site of a psycho geriatric service within a particular Regional Health Authority (RHA) and Holden et al's (2008) site of the Royal Infirmary in Victorian day Newcastle.

Bloomfield and Vurdubakis (1997), citing Latour (1987) and Callon (1986b) as influences, consider the concept of framing. Using the NHS as an empirical site, they examine how representation is actively used in boundary work to constitute and sustain "visions of (re)organisations" (Bloomfield and Vurdubakis, 1997: p. 665). With particular reference to data modelling, there is a link to be made between

context dependent variables, techniques and the Latour/Callon inspired boundary work;

> "Our argument is that representational practices such as information requirements analysis, data modelling and the like, are conceived and employed as technologies of control. They are to be understood as efforts at "world-making" (Goodman, 1978; Kallinikos, 1994), as attempts to institute particular versions of the organization, its members, and their activities,' (Bloomfield and Vurdubakis, 1997: p. 641).

The findings of actor perceptions of data modelling revealed the politics of the NHS site. The ability of "conventions" (Bloomfield and Vurdubakis, 1997: p. 657) of data modelling to mediate multiple divergent interests is assumed by NHS professionals. The ability of data modelling, as an inscription device, to enact "clear decision making" (Bloomfield and Vurdubakis, 1997: p. 658) is seen as an organising practice. In answering research question one, one of the HTA network elements identified is that of the repertoire of health economics, a part of which includes regular methodological dissension over health economics data modelling. Bloomfield and Vurdubakis' (1997) findings from senior data modelling staff reveals telling perceptions of the ability of apparently technical inscription devices to perpetuate a stable decision process.

Modell (2001), citing Oliver (1991), used Neo-Institutional Theory (NIS) to examine the extent to which senior management exhibited pro-active choice in the development of multidimensional Performance Management (PM). Institutional processes were subject to reforms in the Norwegian healthcare sector. Modell (2001) found that pro-active actions by management affected only some de-coupling of performance dimensions. The dimension of healthcare complexity relating to institutional knowledge and boundary is revealed to be sensitive to new realities: "…resisted by physicians on grounds that it is largely alien to clinical realities. The institutional constraints, originating from inconsistent norms and rationalities, effectively contribute to the lack of integration and coherence in PM," (Modell, 2001: p. 460).

Arnaboldi and Lapsley (2005) emphasise the complexity of the healthcare setting in their study on the potential for an ABC framework within an RBTS. While stating that it was not a new problem, the authors stated that identifying activities and drivers was "certainly not straightforward" (Arnaboldi and Lapsley, 2005: p. 69).

The robustness of boundary setting, from an accounting perspective, depends on both the focus i.e. societal, professional and the depth of analysis in the focussed setting. Cardinaels and Soderstrom (2013) carried out an extensive review of recent studies into healthcare with a view to drawing an institutional boundary around the catalyst for accounting system change. They contextually include (hospital) healthcare actors to include: internal actors for example physicians, nurses, CFO, CEO, medical director, management, board of directors, supervisors; governmental bodies for example federal, provincial and local government, legal systems; healthcare market actors for example health insurers, patient groups, hospital competitors, the local community. They make explicit the difference between healthcare and mainstream business enterprises, as empirical sites. Future research avenues should address a broader set of external stakeholders, which includes patient groups, to situate concerns in balancing cost reduction with quality of care. They emphasise the broad view taken regarding performance, within healthcare. Cardinaels and Soderstrom (2013) have shown a breadth of actors to consider in the complex task of healthcare boundary setting.

2.6 – Mobilising Accounting Practices within a Clinical Boundary

Building upon the concerns already established, this section reviews studies which examine the clinical profession's resistance to accounting-based systems of control. Perceived views of dominating accounting logics that conflate and reduce clinical complexity are linked to an unwillingness to extend autonomy and learn new skills, by clinical staff.

Lawrence and Doolin (1997) commented on the changes in discourse due to abrupt reforms in the New Zealand health sector. It had become popular to refer to doctors in two ways; as either "woolly jumpers" or as "the suits" (Lawrence and Doolin, 1997: p. 502). The suits represented a profit-oriented shift in clinical attitude while the woolly jumpers were still committed to the "old public service ethic"(Lawrence and Doolin, 1997: p. 502). Abernathy and Stoelwinder (1995) found that friction between professional and bureaucratic values is decreased when professionals who identify with high levels of autonomy and self-regulation, do not operate in environments where bureaucratic outputs stymie their control.

Seminal to the concerns of juxtaposing accounting control measures with clinical management is the work of Kurunmaki (1999, 2004). Within a Finnish setting, Kurunmaki (1999) examined the shift in power dynamics with the introduction of market forces to health care control. Using Bourdieu's notions of field and capital, the shift from a planning allocation system to that of a competition based resource allocation system was marked by a change in the way that the clinical professionals defined accountability. Kurunmaki (1999) concluded that the process of marketisation had varying limitations and some profound effects. The political concerns of local authorities made them unwilling to create competition, and due to the small number of providers, the required conditions for competition were largely absent. The monetisation of health service transactions did not reveal costs which could not be explained. However, economic reasoning gained in prominence with the majority of the clinical staff.

Kurunmaki (2004) develops her theory of hybridisation, specific to healthcare settings. She establishes the hybridisation of clinical and financial boundaries as one of two accounting areas of research which look at hybridisation. In the Finnish setting, Kurunmaki (2004) establishes that there was a transfer of techniques regarding "calculative practice" (Kurunmaki, 2004: p. 336), between the two professions. Abstract knowledge claims and dominating professional presence did not preside over this transition of the clinical professionals acquiring the new calculative techniques. Citing Abbott's (1988) system of professions, Kurunmaki

(2004) describes the possibilities for hybridisation when inter professional encounters are not presumed to be a "battle" (Kurunmaki, 2004: p. 342). The Finnish example of hybridisation is clarified as occurring within a particular setting, in a national framework. She establishes the call for future research which could contribute to a stronger justification of this occurrence.

> "If the outcome of professional encounters is not always a battle, or if abstract knowledge does not, at all times, play the dominant role attributed to it by Abbott, we seem to need a more nuanced and detailed understanding of inter professional encounters than is currently available. We may find that the ''system of professions'', in a particular national setting and at a specific time, more closely resembles a temporarily stabilized assemblage of skills and techniques, abstract knowledge claims, educational institutions, and academic disciplines," (Kurunmaki, 2004: p. 343).

There are several links to be made between Kurunmaki's (2004) findings above and the accounting framework adopted for the HTA case study. There will be diversity in the professional interactions, skills/techniques, abstract knowledge claims, educational institutions and academic disciplines in the HTA study. Further, the setting, like Kurunmaki's (2004) circumstantial qualification, will occur in a particular setting as part of a national context. The relationship between examining a nuanced accounting ideology and an ANT framework is discussed in more detail in chapter two.

Examining clinical resistance in the relevant healthcare boundary is important. Hybridisation suggests that this be a careful process as the hybrid professional will be specific to particular settings. Scarparo (2006) cited Kurunmaki (2004) in establishing that a similar process to hybridisation had occurred in a comparative study in both Swedish and Scottish healthcare settings regarding the feasibility of incorporating costing information within medical audit frameworks. Scaparo (2006) found that one of the key differences in the mobilisation of costing data in medical audit, by clinicians, was the presence of "adversarial position" (Scarparo, 2006: p. 152) by the clinical directors. Engagement by clinicians who were also part of a

management structure resulted in a positive attitude to the presence of costing Figures in clinical data. However, non-clinical managers did not express a desire to encroach with the "clinicians' sphere" (Scarparo, 2006: p. 152) as did the clinicians who were not part of a management structure.

Broadbent et al (2001) examined the resistance strategies employed by GP practices in the wake of New Public Management (NPM) reforms. The accounting-led reforms were resisted by the GP's. Their resistance is linked to institutionally embedded autonomy. The dual importance of considering the social circumstances from which accounting systems are both created/served and the specificity of complex clinical boundary setting are represented in Broadbent et al's (2001) key findings regarding resistance strategies: "when a normative institutional context which drives organisational behaviour (in this case the behaviour of GP practices), is perceived to be threatened by a regulative and/or cognitive institutional environment, organisational resistance will be inevitable and apparent," (Broadbent et al, 2001: p. 581).

Ballas and Tsoukas (2004) question the assumptions of an assumed accounting centrality. They find that the impact of accounting systems is marginal in the Greek National Health Service (ESY). The highly politicised Greek context dominates the definition of criteria for organisational and individual performance. There is a distinct tone in the authors' assimilation of accounting to one that is objective and consisting of a set of tools whose purpose is to aide "rational calculation" (Ballas and Tsoukas, 2004: p. 685). The apparent power behind the highly politicised socio-economic system, in the context of ESY, is traditionally held by the medical profession. The constitutive symbols of ESY are held synonymously with those in power. Resistance to accounting systems is found to be easily mobilised. The accounting system is argued to represent a discourse of "technical" (Ballas and Tsoukas, 2004: p. 685) visibility, which is distanced from the representation of contextual values.

Webster and Hoque (2005) examined the issues relating to a cost accounting system in an Australian teaching hospital in light of public sector reforms. These included the increased use of private sector principles and tools. Resistance by clinical staff is significantly linked to the question of the accuracy of costing information. They found that the institutionalisation of the cost accounting system by actors was unfinished but that the attempts (managerial seminars et cetera) were starting to devolve further into the organisation.

Purdy and Gago (2009) examined the changes in perceived autonomy during a period of significant change in the Galician healthcare system. In-depth consultation with a financial manager and change co-ordinators formed the basis of this longitudinal study. Particular comments relating to the clinical resistance to accounting surround the fact that the financial manager did not receive training for a role change and co-ordinators were inappropriately tasked with expenditure efficiency. Purdy and Gago (2009) cite Oakes et al (1998) in reference to the "field restricted production" (Purdy and Gago, 2009: p. 68) of medical practitioners. They assert that if this is so, then medical practitioners were already autonomous in pre-change medical centres and that they value this autonomy more than is perhaps understood by Galician legislation.

2.7 – Accounting and Healthcare Issues in Practice – Diagnosis Related Groups

This section applies the three accounting and healthcare concerns to the particular boundaries of Diagnosis Related Groups (hereafter DRGs). Due to the breadth of the accounting literature on healthcare, the chosen focus of DRGs as a popular empirical site, for example see Chua and Degeling (1993); Preston et al (1997); Chua (1995); Modell (2001); Ernst and Szczesny (2005); Forgoine et al (2005); Gaal et al (2006); Samuel et al (2005); Jarvinen (2009); Lehtonen (2007); Soderstrom et al (2006); Chapman et al (2014), was selected in order to demonstrate the difficulties inherent in healthcare boundary setting. The variability of calculative practice, in relation to the issues so far discussed in this chapter, is explored and discussed. Also, the

insights of DRGs as an accounting technology itself are discussed and linked to diagnostic concerns in the NICE HTA case study. The reasons given for differences in varying DRG framework calculative practices are linked to the contributor experiences in the HTA process and how they perceive calculative practice.

Newhouse (1989), in reference to the concerns of accounting and economics conflicts, examined the likelihood of Medicare patient selection by hospitals in the US healthcare system. The advent of the Prospective Payment System (PPS), an attempt to garner more efficient and controllable federal outlays in the Medicare programme, meant that patients could be attributed with varying profitability based on their DRG classification.

In examining the difference between economic and accounting definitions of profit, Newhouse (1989) investigates the impact such variances have on the access of treatment by high cost patients. He refers to "selection" (Newhouse, 1989: p. 33) as the short term admitting practices which hospitals used to achieve good short term profitability. Admitting fewer high cost patients was called "dumping" (Newhouse, 1989: p. 33) and its opposite was “skimming” (Newhouse, 1989: p. 33). The success of DRG, as an accounting technology, is discussed in the differences between profit definitions assumptions between accounting and economics. These differences include; capital valuation, average costs versus marginal costs and that accounting costs are fully allocated. The author summates that "researchers in this field are constrained to use a measure of accounting profit that may or may not correspond well to true economic profit," (Newhouse, 1989: p. 34). This is similar to the earlier points made by Mogyorosy and Smith (2005). The representation of values, in this DRG focus, is privileged depending on the focus of the study.

Preston (1992) emphasised that the change of accounting discourse to something based on cost-reimbursement (in the context of DRGs) must be examined in the historical and social context through which it developed. He proposes the "reconceptualisation" (Preston, 1992: p. 66) of hospitals as a multi product firm with DRGs as products. The skill sets employed by hospitals are to advance themselves in

"DRG gaming" (Preston 1992: p. 95). Preston (1992) reported similar findings in his historical analysis, to Newhouse (1989) regarding the unintended consequences of DRG based accounting frameworks within hospital settings: DRG dumping and cost concerned attitudes to prioritising patient care i.e. profitable patients. Preston (1992) acknowledged the ethical implications of this, the crossing of accounting's power into the decisions and activities of doctors and also of the unintended consequences that DRG had for placing the burden of severe DRG patients on public institutions.

(Preston, 1992) described these issues a "politics of health" (Preston, 1992: p. 95). The particular setting within a national framework means that adopting a societal focus has given a publicly-wide boundary to what is a severe-DRG patient. The same logic exists within the HTA process such that more widely understood conditions like cancer are better placed for a public understanding of calculative practice than lesser known conditions. The perceived incentives of the accounting technology are argued to have changed from original intentions[4]. The advent of DRG had allowed accounting to examine more closely, the minutiae of clinical activities, something previously controlled wholly by doctors. Preston (1992) hypothesised the birth of a new form of clinical accounting whose locus would more fully reflect and regulate the "medical domain" (Preston, 1992: p. 95)

While Preston's (1992) work is about the American health care system, the issues he describes regarding the need to place accounting technologies within the appropriate social, historical and political discourse are very much relevant to the justifications of accounting to be made within the HTA case study. The political and social discourses regarding varying diagnostic area (of the in situ health technology) present variable concerns regarding the representative ability of particular measures. In justifying such representative ability, it is important to place interviewee concerns in line with the political and social circumstances of their diagnostic area for example the experiences of cancer related individuals (with resources available, understanding

[4] Preston's (1992) comments regarding the decoupling of incentives from those originally intended in the design of the measure bring to mind core ANT tenets on the status of 'facts' as dependent upon the transformations in later users' hands (Latour, 1987) and the criticisms of ANT founders in the way in which ANT had been disseminated through different disciplines.

of the disease, support experienced) must be juxtaposed circumstantially with those of a rare and little known disease.

Emphasis on the importance of the social/political/economic circumstances from which accounting technologies were created and serve is again argued by Preston et al (1997). The history of the American DRG prospective payment system (PPS) is considered in reconceptualising DRGs as a form of "government at a distance" (Preston et al, 1997: p. 158). DRG-PPS, as an accounting form, is localised in the process of legitimising rationing decisions in relations between federal government, healthcare providers and the elderly populace. The emphasis on these social circumstances is tied closely with the rhetoric that accounting tools came to be associated with;

> "DRG-PPS was not born in the name of cutting or redistributing health care resources – it was born in the name of eliminating waste, remedying mismanagement, improving efficiency and reducing the role of government, all virtues in the US culture of the 1980s. Its grounding in the rhetoric of economic efficiency was supported and sustained by appeals to expertise and objectivity, and to forms of calculation that would result in a more effective means of administering health care to the elderly. This grounding, along with the apparent "facticity" of DRG prices provided a veneer of expertise that effaced the political nature of the decision to ration health care to the elderly: indeed, it rendered the life and death decisions inherent in rationing invisible," (Preston et al, 1997: p. 161).

The importance of boundary setting and choice of focus is shown with the centralisation of calculative practice, in Preston et al's (1997) example. The richness of clinical complexity is lost and the appropriateness of a financially expressed efficiency rationale is automatically assumed.

Chua (1995), citing Callon (1986b) and Latour (1987), examined the emergence of new forms of accounting, namely case-mix systems, particularly DRGs. The networking activities of experts in professional actor groups affect the shift in choice of accounting form, rather than certainty of economic outcomes. Chua (1995)

discusses the form of the DRG as an inscriptive device, which exemplifies the way an accounting framework has extended control of the clinical domain. The danger of calculably reducing the clinical domain is expressed for example, "A costed DRG is not identical to a physical entity called Mr Packer who had suffered a heart attack" (Chua, 1995: p. 140). The complexity of the clinical boundary is further addressed when Chua (1995) challenges the assumed centrality of DRG calculative practice. The reality of resource allocation decisions is subject to context.

> "Capital expenditures were not immaterial items. They made up a sizable proportion of a hospital's expenses. However, the Group excluded such expenses from consideration – primarily because there was no method by which they could easily trace consumption of capital assets by individual product lines. And thus like the designers of the American Prospective Payment System, the Group decided to put all items labelled "capital expense" in the "material but too-hard basket"...The Group accepted that such an assumption of identical relative resource consumption might not be valid since differing treatment protocols could exist between the two countries," (Chua, 1995: p. 133).

Chua's (1995) argument highlights the concerns of the healthcare context and appropriateness of the accounting framework. The costing differences between the two countries (Australia and America) are an important element for DRG development. The context of resource allocation and institutional knowledge are often at odds with central DRG calculative practices. This results in contextually different DRG calculative practice for example see Soderstrom et al (2006); Ernst and Szczesny (2005); Gaal et al (2006). It is important to consider these differences in the context of the HTA case study. There are context dependent methodological differences in the costing practices of various HTA contributors for example by ERG institution, between the ERG and the manufacturer, by diagnostic area. It is worthwhile mentioning here that context dependent differences in calculative practice are further analysed for a nuanced form using ANT

Jarvinen (2009) examined the relationship between managerial agenda and occupational identity in interviews with management accountants in five Finnish

public hospitals. The change in the New Public Management (hereafter NPM) agenda is represented in the evolution of accounting systems from Activity Based Costing (hereafter ABC) methodologies to DRG frameworks. Jarvinen (2009) contributes to discussion on the difficulties facing central DRG practices when faced with context dependent resource allocation.

> "One key feature of the National DRG Standardization Project was to implement a uniform cost accounting system in hospitals irrespective of local needs or strategy. Interestingly, this suggests that key decision-makers may have disregarded the notion common in accounting literature that strategy, structures and accounting control systems should interact (see, for example Abernethy and Lillis, 2001). Instead, strategy was seen by the interviewees as irrelevant and attention was directed to benchmarking strategies (see Llewellyn and Northcott, 2005). The actual costing system implementation, however, was decentralised and left the majority of decision-making power at the local level. Like Grafton and Lillis (2005) we found that reactions to public policy agenda and standardisation differ somewhat, and that decentralised autonomy has the potential to influence how goals of managerial reforms are achieved," (Jarvinen, 2009: p. 1204).

The trade off between strategy and benchmarking exemplifies a strong philosophy of economic efficiency. This, coupled with a confirmation of context dependent decision making might infer that the decentralised autonomy is still influenced strongly by an economic philosophy. It is interesting to consider these findings in the context of future work with HTA's and the changes to be made within PCT's due to the advent of Value Based Pricing.

Samuel et al (2005) extends the discussion regarding the centrality of non-clinical professionals' autonomy over clinical boundaries. The values imputed by these professionals' highlights the danger of calculably reducing clinical complexity. The contextual complexity of the clinician's boundary is considered in relation to the power of other professional "rivalries" (Samuel et al, 2005: p. 252). The history and social context of the emergence of DRGs is linked to an initial design by engineers, the development of theory by economists and the realisation of a "business

opportunity" (Samuel et al, 2005: p. 249) by accountants. The legitimisation of these professions is argued to have lead to the creation of a "physico-fiscal body" (Samuel et al, 2005: p. 274).

> "We suggest that since DRGs statistically tie organ-systems to fiscal categories they constitute the components of a ''physico-fiscal body''. As DRGs circulate throughout the healthcare industry, knotting together patients, doctors, insurers, and state agencies among others, they spread the illusion that the body is an artefact fabricated by engineers, economists, doctors and accountants. People are being seduced to understand themselves through the physico-fiscal categories which professionals, jostling for jurisdiction, have imputed to them," (Samuel et al, 2005: p. 274).

Like Chua, the physico-fiscal body is seducing healthcare players to value health services in these terms.

Lehtonen (2007) addresses the concern of clinical staff resistance to accounting frameworks, in particular DRGs. Key findings were similar to Scarparo (2006) in that a willingness to engage by clinicians was essential to the transition of accounting change. Embedding changes in institutional processes required engagement at the central level; perspectives and use of DRGs diverged when it came to departmental/individual analysis.

Lowe (2000) examined the effects of adopting DRG coding and case-mix accounting systems on internal operations within a New Zealand public hospital. The effect of an accounting-dominated framework on clinical agendas and activities centred on new rational ideologies. The paper found real changes in patient management procedures, hospital management structures and resource allocation decisions.

Chapman et al (2014) conducted an analysis of the interdependencies between DRG systems and costing practices. The paper prefaces the state of American healthcare, the growth of DRG systems and the impact that they have had on management

accounting practices in the healthcare context. The influence which policy makers have on healthcare provider's costing practices is considered in a framework of interdependencies between DRG systems and costing practices. They consist of the following (relational) costing elements to healthcare practice; costing practices, costing guidance, DRG systems and clinical practice. In positioning the variability of DRG grouping and definition, the costing elements are analysed in relation with geographical DRG use, cost inclusion/exclusion (for example the German DRG system excludes infrastructure costs from cost calculations), auditor impact and the accountant/clinical staff divide in the development of costing practices. Some of the implications of this DRG variability (as an accounting-based technology) are explored; the creation of the "medical controller" (Chapman et al, 2014: p. 359) (an accountant staff member accountable to clinicians), the development of a "rival practice" (Chapman et al 2014: p. 361) perspective between accounting and non-accounting healthcare players, referencing Kurunmaki's (2004) theory of hybridisation.

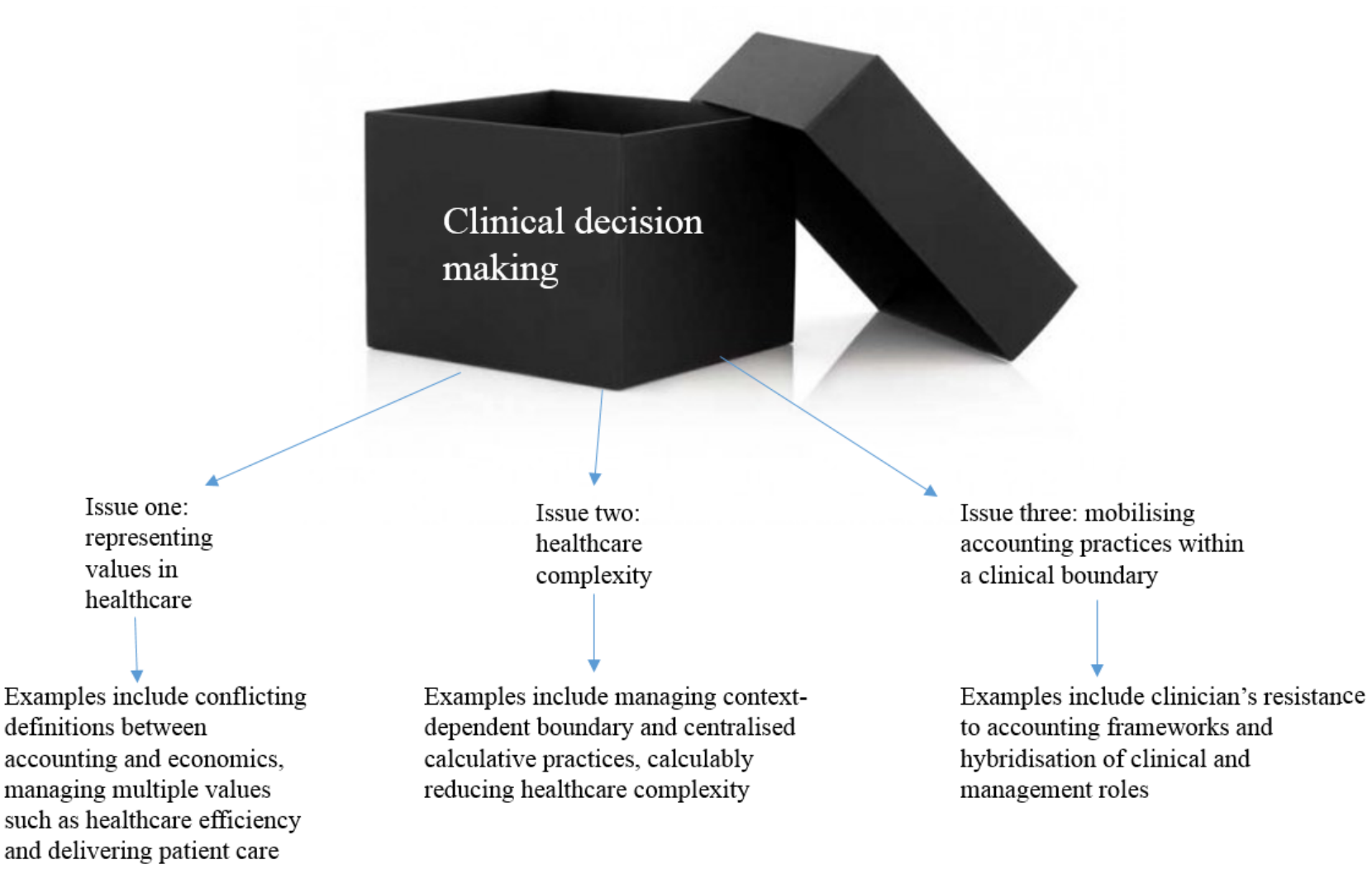
Chapman et al (2014) suggest that future research might adopt a framework which considers the use of cost and pricing data that a wide range of players - within a contextualised setting of healthcare - use. The case study which is featured in this thesis, falls within this category. Chapman et al (2014) have an accounting focus, with the DRG being an accounting technology. The accounting/non-accounting divide could be expanded upon by authors who have a more context-dependent focus.

Figure 5 shows an evolution of the conceptual black box diagram introduced in Figure 1. In chapter one, I justified the research questions by contextualising the key tensions within the HTA debate i.e. health resource allocation and meeting diverse patient demand, the controversy between central calculative practices and subjective decision making my the appraisal committee. As this is an accounting case study, this chapter has reviewed HTA and accounting healthcare literature. Figure 5 summates the validation of key tensions described in chapter one, from findings within accounting and healthcare. The contents of the black box i.e. decision making

processes which are centrally managed and also use subjective value judgements, is subject to consistent issues within healthcare, which are shown in Figure 5. This was confirmed by comparison to DRG literature.

There were similarities of issues that arose from DRG review and the tensions discussed in the HTA literature for example Jarvinen (2009) noted that the although a conceptual benefit of uniformity in using DRGs was intended, the implementation of the costing system effectively meant that decision making was local and decentred. Similarly, the apparent common measure benefit of QALYs in HTA decision making, is argued by Harris (2005) to be a false representation and guilty of numerous forms of discrimination including age and ethnicity. He finds that NICE is disposed to evaluate patients rather than treatments, a process which is similar in subjectivity to Jarvinen's (2009) findings on the flexibility of decision making to meet localised healthcare complexity needs. Figure 5, then, captures these issues which have been thematised in chapter two; representing issues in healthcare, healthcare complexity and mobilising accounting practices within a clinical boundary.

Figure 5 - Showing accounting concerns within healthcare



2.8– Chapter Summary

The breadth of literature regarding healthcare requires a strong statement of refinement and purpose. Emphasis has been placed on literature which considers the social circumstances of accounting's operation in healthcare. The definition of healthcare has been taken broadly; empirical sites vary widely and reflect the richness/complexity of the healthcare profession.

In this chapter I have outlined three main areas of concern for an accounting researcher working within a healthcare site: the conflicting effects of accounting/economics-led frameworks and the importance of considering the healthcare context in their development; the sensitivity and richness of the clinical profession as an empirical site and the potential under-representation of this by calculably reductive frameworks; and clinical resistance with accounting-led frameworks of control. I have shown these accounting concerns within healthcare in diagrammatic form, in Figure 5. The transferability of these concerns is shown in practice with the review of a particular area of contribution within accounting/healthcare literature, namely the implementation of Diagnosis Related Groups (DRGs). This is justified by the popularity of DRGs as an empirical site and the similarities of consideration between applying these issues to DRGs and to the HTA calculative practices. Similar themes arose from the review of HTA, accounting/healthcare and DRG literature.

The variability in DRG calculative practice and perceptions is tied to all three concerns; issues with accounting-led approaches that calculably reduce healthcare complexity (see Chua (1995); Preston (1992); Preston et al (1997)), the context dependent boundary which conflicts with centralised calculative practices (see Jarvinen (2009)), the active engagement processes required to mobilise clinicians in engaging with accounting systems (see Lowe (2000); Lehtonen (2007); Chapman (2014)).

Links have been made throughout the chapter to the points of particular relevance for the HTA case study. In light of the complexity of the empirical site associated healthcare players, a broad view of both healthcare and calculative practice is advocated. The contextually dependent boundary of the healthcare site has been linked several times with ANT. The healthcare issues framed in this chapter are argued to benefit in clarity from the boundary/framing insights that ANT tracing would provide. The nuance and detail provided are argued to allow for an analysis of centralised calculative practices in particular contexts. The next chapter details the key ANT ideas and techniques that will be used in the NICE case study.

CHAPTER THREE
FRAMING ACCOUNTING AND HEALTHCARE CONCERNS IN ACTOR NETWORK THEORY

3.1 - Introduction

In chapter one, I introduced my motivation for conducting a case study exploring HTA at NICE. Key contextual tensions between health resource allocation and healthcare complexity in HTA decision making were outlined. In chapter two, I showed that accounting systems in healthcare settings, rely on localised contextual boundaries and wider societal focuses for definition. The importance of the clinical context is often the subject of ideological battles regarding efficiency. This thesis is examining the calculative practices of both a central decision system and a diverse decision area. With a defined boundary, the examination of accounting within this healthcare setting requires a theoretical framework which centres on the materiality of both central and local calculative practice implications by the many healthcare players involved. I see this as a network of decision making. The theory of networks and actors, known as Actor Network Theory (hereafter ANT) is applied in this chapter. The analytical tools used to develop an ANT framework are set out. The Sociology of Translation and other key ANT works are taken as a roadmap for conducting accounting research. Disciplinary specific (Accounting and Healthcare) "assemblages" of ANT (Justesen and Mouristen, 2011) are overviewed in recognition of discipline relevancy in the evolution of ANT. The building of an ANT inspired conceptual framework is justified by its ability to provide support for answering the two research questions of this thesis a) what network elements are revealed in speaking directly with HTA contributors and decision makers? b) what do these network elements reveal about HTA calculative practice at NICE?

3.2 - Actor-Network Theory

This section will provide an overview of ANT principles and terms. The breadth of literature written by ANT theorists is considerable and has developed over time for example see Latour and Woolgar (1986); Latour (1987) Callon and Latour (1981) and Callon (1986a, b). Studies using this literature as a theoretical framework basis are prolific within disciplines. The ANT literature from ANT theorists that this thesis identifies with, in the context of framework building, is primarily Latour (1987) and Callon (1986b).

3.2.1 - Actor

Latour's (1999) continued descriptions of a truly vague and bizarre "topology of the social" (Latour, 1999: p. 18), which achieves legitimacy through increased associations, mirrors the definition of what it is to be an actor. Latour's (1987) comments regarding the quality of technical literature being 'social' due to disproportionate local associations being made, leaves out thoughts of gender/politics/classes et cetera . It is so with actors as well. There is no definition of the form that an actor might take, rather that it has an ability to persuade and enrol others that it will is the right path to go along.

Callon (1999) spoke of the radical indeterminacy of an actors' definition and in (1986) cautioned that for the observer of a network, there can be no a priori privileging of an actors' form. An entity can be described as an actor when it has the ability to act, to translate the will of others and achieve the status of a spokesperson. Callon (1991) noted the potential forms such entities could take; "they may but need not be collectives. They may take the form of companies, associations between humans, and associations between non-humans." (Callon, 1991: p. 140).

Hache and Latour (2010) refer to non-humans and on the selective analyses that social scientists make which are limited by dichotomisations of Nature/Science that privilege actor definitions: "The moral question is dismissed here not because the

text deals with a problem of law, but because the author does not keep open the question of means and ends. For that hesitation, which may be said to define morality, he substitutes a fixed division of competence in morality between humans and non-humans," (Hache and Latour, 2010: p. 5). Non-human phenomena can be considered to be actors if they have the ability to act. In the case of the HTA study, the financial budget can be said to be a non-human actor present at decision making, enacting imperatives and boundaries upon human actors and affecting/influencing their goals

3.2.2 - Networks

Callon (1986a) describes the network as assemblages of constituents that come together in reciprocal translations of varying kinds of associations. In describing the enrolment of a new social topography (battling for control of the fact status by bringing further concerns) he emphasises that the "actor-world" (Callon, 1986a: p. 20), being the currently enrolled agenda and accordingly built around the controlling entity, is both unified and self-sufficient. Actor-networks show that these actor-worlds were built from a structure. They enrolled new assemblages and translated existing associations for their benefit, showing that they are susceptible to change. Latour (1987) describes the embodiment of facts within the networks which bore them and their inability to transcend beyond them.

Latour (2010) cautions readers to not think of a network as simply something which looks like a net. Indeed in Latour (2004) he jokingly reminds his fictional student that such confusion perhaps lies at the door of Callon (1986b). He states that a "network is defined by the series of little jolts that allow the inquirer to register what takes any substance that had seemed at first self contained (that's what the word means after all) and transforms it into what it needs to subsist through a complex ecology of tributaries, allies, accomplices, and helpers...whenever a network is deployed, a substance is transformed from an object into a thing, or to use my terms,

from a matter of fact to a matter of concerns...an actor is nothing but a network, except that a network is nothing but actors," (Latour, 2004: pp. 4-5).

3.2.3 - Black box

The settlement of a controversy results in successful enrolment of the dissenters will by mobilisation of the new social domain as fact through the rest of the network. Latour (1987) suggests that the black box occurs when "many elements are made to act as one" (Latour, 1987: p. 131). In documenting the journey of the scientist in action, Latour (1987) states that we must reopen the controversies which had previously been taken for granted. In doing so we are opening what had been black boxed – a particular set of associations and materials which came to constitute one element. The HTA case study follows HTA in action. The HTA decision process, which is a set of calculative practices, is questioned and not tied to any a priori assumptions. In the act of questioning the calculative practices. I am re-opening the black box of HTA decision making. Callon and Latour (1981) described the contents of the black box and that the box is never truly shut: "An actor grows with the number of relations he or she can put, as we say, in black boxes. A black box contains that which no longer needs to be reconsidered, those things whose contents have become a matter of indifference. The more elements one can place in black boxes – modes of thought, habits, forces, and objects – the broader the construction one can raise. Of course, black boxes can never remain fully closed or properly fastened...but macro-actors can do *as if* they were closed and dark," (Callon and Latour, 1981: pp. 284-285).

3.2.4 - Inscriptions[6]

Inscriptions are those devices which mobilise the original intent of someone who is either trying to change the black box to their agenda or who is trying to stabilise black boxes which they have already sealed. Commanding leadership of the black box is heterogeneous to the controller. The way in which they bring together visual displays, texts, diagrammable information and then reduce/combine/reclassify associations within the black box in such a way is designed to convince the intended audience that what they see is the absolute truth. Latour (1987) describes the realism behind what the eyes see and what the mind associates with such visual techniques; "We are no longer asked to believe the text that we read in Nature; we are now asked to believe our own eyes...Do we see more or less than before? On the one hand we can see more, since we are looking at not only the graph but also the physiograph, and the electronic hardware, and the glassware, and the electrodes, and the bubbles of oxygen...we can see more, since we have before our eyes not only the image but what the image is made of. On the other hand we see less because now each of the elements that makes up the final graph could be modified so as to produce a different visual outcome," (Latour, 1987: p. 66).

3.2.5 - Obligatory Passage Point

The Obligatory Passage Point (hereafter OPP) is the focus of control which challenging dissenters centralise within the associations they require for leadership of the black box. Latour (1987) describes the necessity of having associations with other entities in order to establish objective definition: "As with Robinson Crusoe on

[6] One of my favourite author's is the historical novelist Georgette Heyer. In her Regency romances, she often depicts the rush of the fated lovers to avoid a fait accompli and stop notices of engagement to the Gazette (a newspaper of the time). This announcement would signal to the polite world that members of the fashionable Ton were getting married. The rules of the Ton are strict - the black boxed truth is that reputation is everything, more than happiness. Young ladies on the "Marriage Market" (Kloester, 2008: p. 87) are signified as worthy by their admittance to places like Almack's Assemblies dance halls, by leading patrons of the Ton who issue admittance vouchers. The Gazette and institutions like Almack's are examples of inscriptive devices. They perpetuate the rules of the Ton. The patrons issuing vouchers define the proper standards for behaviour and fashion in polite society. They control the black box of polite world behaviour and definitions through the use of inscription devices such as the Almack's admittance vouchers.

his island, the boundaries between daydream and perceptions becomes fuzzy, since he has no one to dissent with him and thus create a difference between facts and artefacts," (Latour, 1987: p. 152). In taking control of the black box, the dissenter must persuade other required actors that association through this OPP is the only way to achieve their individual goals. Callon (1986b), in his discussion of the sociology of translation, uses the St. Brieuc bay example to show that the three scientific researchers have rendered themselves indispensable to the scallop network by making associations with the other entities an OPP. They are seeking to convince the required entities they must associate with (in order to take over the black box) that their scientific knowledge and methods are the only way to achieve goals. Their scientific knowledge and methods become the OPP which actor including fishermen and scallops, must pass through in order to get what they want.

3.2.6 -Translation

The idea of translation is discussed frequently in Latour's works but the explication of Callon's (1986b) sociology of translation is the road-map by which the actor-network account within this thesis is constructed. Translation concerns the enrolment of others into roles and duties which are necessary to changes a dissenter wishes to make to the current contents of the black box. The dissenter, who needs these new associations for the stability of their social domain, seeks control by locking others into these identities and duties. These others are convinced via the enrolment that not only do they share common interests, but that the only way of doing so is by virtue of the network placement controlled by the dissenter. Actors can translate in unexpected ways.

Latour (1987) describes this process in a series of persuasive translations: "Translation one: I want what you want...Translation two: I want it, why don't you?...Translation three: if you just make a short detour...Translation four: reshuffling interests and goals" (Latour, 1987: pp. 108-113). Latour (2003, 2005) defends the focus of ANT as relating to matters of "concern" as opposed to matters

of "fact". In the context of translation, he challenges the meaning of what different people mean by the term social. Through sense-making examples, as is his style, he demonstrates how the social has vanished in two ways. The first occurs with the redundant addition of the term to a description of something. The second is that of association. Mediators do not transport something unchanged, but instead translate according to the transformations that occur in space and time.

3.2.7 – Network Elements

In Latour's (1987) discussion on the centres of calculation, he describes how the dissenter who wishes to control the black box from a distance, must in a timely fashion mobilise the "largest number of elements and their greatest possible fusion," (Latour, 1987: p. 237). In translating interests, the dissenter must capture as many relevant aspects of network involvement, from those they need to stabilise this new controversy. The stabilisation of the controversy involves the acceptance of new actor duties and network boundaries. For the dissenter to successfully stabilise these new duties, they are required to capture aspects of network involvement which are desired by actors. To convince actors of the stability of the black box, the network will encompass sufficient elements which represent their interests, but the success in doing so lies within the context of managing from a distance and the diversity of local actor interests. Latour (1987) describes the balancing act of what network elements represent when the dissenter manages from a distance and must include multiple actors and their varied interests: "The ideal would be to retain as many elements as possible and still be able to manage them...What is the minimum sample that allows me to represent the largest number of features?" (Latour, 1987: p. 237).

3.3 - Sociology of Translation

This section shall outline the sociology of translation, which forms the basis for the actor-network account of the HTA process at NICE. The justification for this choice combined with key works from Latour (1987, 2005) is discussed after the introduction of these key terms and principles.

3.3.1 - Principles

Callon (1986b) begins by discussing some of the problems facing sociologists who unconsciously privilege science and nature. In categorising the universe, sociologists are accused of censoring the actors to whom they are personally motivated to label. Conceptual frameworks are picketed by different sociological camps (Callon, 1986b), rendering the tools used in the nature/science divide as open to controversy as the nature/science divide itself: "consensus, when it occurs, seems even more rare and fragile than in other fields. Should one speak of social classes and interests rather than norms and institutions?...The issue is clear: the sociological explanation of scientific and technical controversies is as debatable as the knowledge and objects which it accounts for," (Callon, 1986b: p. 3).

Callon (1986b) problematises the methodological difficulties facing researchers, primarily surrounding the reduction of actors situated within the controversy that the researcher wishes to translate. Can the individuals amongst multiple sociological camps agree on every aspect of a controversy's foundations? Can individuals, in exerting their will upon others, produce a collective account that blends the exact positioning/wills/methodologies/souls of the actors involved in the controversy they seek to take control of? In posing these questions, Callon (1986b) goes back to the EDF story mentioned in Callon and Latour (1981) and questions the ability of anyone to fully render Renaults positioning.

> "During their elaborations, those sociologists who have studied scientific and technical innovations have realized that both the identity and the respective importance of the actors are at issue in the development of controversies. What are the convictions of Pasteur or Pouchet concerning spontaneous generation? The positions of the protagonists are never clearly defined, even retrospectively. This is because the definition of these positions is what is at issue. What actually were the interests of Renault when the EDF announced that the end of the twentieth century would inevitably see extensions in the use of electric vehicles? Who could one have turned to, to know what Renault really wanted? Science and technology are dramatic 'stories' in which the identity of the actors is one of the issues at hand. The observer who disregards these uncertainties

> risks writing a slanted story which ignores the fact that the identities of actors are problematic.” (Callon, 1986b: p. 3)

Callon (1986b) answers these challenges with a solution that is structured around three methodological principles. The first is centred on the idea of broadening the agnosticism of the viewer (for example the sociologist, researcher, outsider) to incorporate the social sciences in their analysis. The viewer remains independent of the scientific/technological arguments used by those involved in the controversy and does not censor the actors' account of the context. By retaining independence of the contextual rules, the researcher can account for the controversy without privileging its actor components. If the identity of actors is always problematic, always open to negotiation then the fixing of identities by the researcher can only be made through their own a priori assumptions.

The second principle is concerned with generalised symmetry (Callon, 1986b). In the fact-creation war, there are numerous controversies that champion for becoming black boxed, in other words being made fact. The contenders all have their own vocabulary with which they will try to achieve their goals. In the case of ANT this includes the enrolment of actor wills in translating a controversy towards a stable black box. Generalised symmetry is concerned with the need to avoid explaining the controversy to the other members of the camp in the terms used by the contextual actors (of the controversy). If we are asked to define a word, we cannot use the word in the definition. Callon (1986b) recognises that his theory of translation is just another contender with its own "repertoire", but that the vocabulary used to try and convince others must be consistent and must not be contextual to the controversy.

In a critique on the issue of symmetry in ANT studies, McLean and Hassard (2004) note the frequent reprimands facing ANT authors. The sense of symmetry within findings is challenged to exist between an absence of symmetry and “symmetrical absurdity” (McLean and Hassard, 2004: p. 493). McLean and Hassard (2004) critique five concerns for researchers who are producing ANT accounts. These include "the inclusion and exclusion of actors; the treatment of humans and non-

humans; the nature of privileging and status; the handling of agency and structure; and the nature of politics and power in 'heterogeneous engineering', (McLean and Hassard, 2004: p. 493).

The third principle is concerned with free association whereby the viewer must recognise that the evolving social domain they are privy to is changing without respect of their natural biases. They viewer must discard a priori distinctions between natural and social events and must consider the notions of a definite boundary as illogical: such boundaries and divisions drawn would be as a result of the viewer imparting their own agenda upon the evolving social domain (Callon, 1986b). The idea of something being definite should be abandoned in the repertoire of translation. Nothing is ever fixed, always open to change and the viewer must recognise that the network they observe is always part of the actors' discussions;

> "the observer must consider that the repertoire of categories which he uses, the entities which are mobilized, and the relationships between these are all topics for actors' discussions. Instead of imposing a pre-established grid of analysis upon these, the observer follows the actors in order to identify the manner in which these define and associate the different elements by which they build and explain their world, whether it be social or natural," (Callon, 1986b: p. 4).

The viewer must consciously recognise that while they naturally bring their own motivations and biases to any study, the evolving social domain (the new controversy) they are witnessing and trying to enact upon by enrolling others to its presence, must be left to the construction of the actors themselves. In other words, the viewer must follow where the actors lead them.

3.3.2 - The Four Stages of Translation - Problematisation

Callon's (1986b) process of translation has four distinct stages: the problematisation "or how to become indispensable" (Callon, 1986b: p. 6). This includes the inter-definition of actors and defining the Obligatory Passage Points (OPP). The second stage is the locking in places of allies using the devices of interessement. The third is

the enrolment of actors. The fourth is the mobilisation of allies. The four stages are conceptualised throughout the controversy which occurred in the attempt to create a new scientific knowledge about a breed of scallops called Pecten Maximus that had previously made St Brieuc Bay famous, but had been so intensively farmed that the population of Scallops were dwindling.

Callon centred the controversy on those actors who colluded in the creation of new methods for cultivating the scallops. Like Latour and Woolgar's (1986) "conversations" which become fact, Callon (1986b) points out that ten years after the controversy surrounding the scallops, there had been the creation of a scientific knowledge that was "produced and certified" (Callon, 1986b: p. 6). The collusion of multiple actors during the black boxing was motivated by different actor goals. One actor group included the CNEXO researchers who sought to transplant a research technique they had witnessed in Japan which related to cultivating sea-life to St. Brieuc Bay – a novel contribution to research amidst a scientific community who was not especially interested in gaining new knowledge of the life cycle of the scallop. Another actor group included the fishermen; who relied on a sustainable scallop population (Pecten Maximus) for their living and who stated that they did not know about the scientific aspects of the scallop life cycle. There were therefore several interested parties who were brought together during the controversy. Figure 3 shows a diagrammatic form of these interested parties that were motivated to become involved in the controversy surrounding increased knowledge of the life-cycle of scallops.

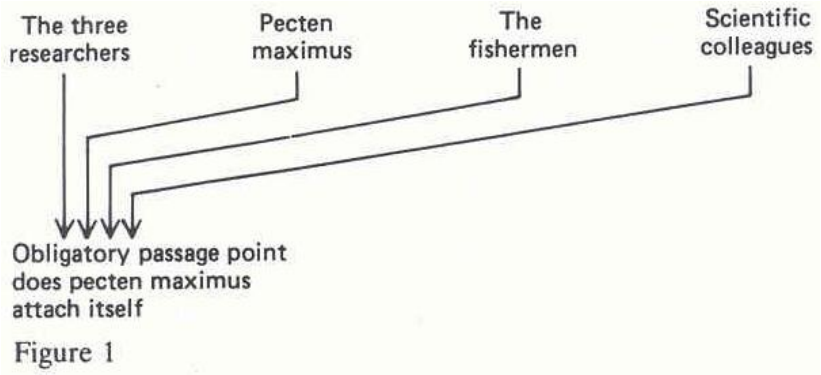


Figure 6 - Showing the actor groups associated with the controversy at St. Brieuc Bay, adopted from Callon (1986b: p. 20)

The problematisation begins with the journeying of the three researcher's motivations to study the transportability of the Japanese sea-life cycles to other geographical areas. Due to the lack of interest from the scientific community regarding the life-cycle of scallops, the three researchers' agenda was the only contender in what Latour and Woolgar (1986) might have labelled a conversation. The three researchers, in writing their proposed research and all about the place they would be situated, what they would be doing, how they would be doing it, who would be involved et cetera intrinsically anchored themselves as essential amidst a set of actors/relationships/materials (associations) which they had also defined. It was only through the motivation of the researchers that the different actors involved in the controversy would achieve their goals.

Pecten Maximus populations could continue to survive and flourish as a result of the researchers discovering if their new method could revitalise scallop growth. The fishermen would once again have a flourishing trade and livelihood as a result of the researchers and their methods which would increase the scallops available for catching. The scientific colleagues who hold no knowledge of the scallop life cycle are considered as having a vested interest as there is currently a vacuum of black boxes concerning the subject. The three researchers are concerned with championing the new scientific knowledge and as they are the primary instigators, they have established both a network of interested parties and have also rendered themselves as indispensable i.e. the three researchers have defined the obligatory passage point as being the scientific question to which the scientific knowledge is the answer and black box - does pecten maximus attach itself?

3.3.3 - Interessement

The second stage of translation is concerned with the devices of interessement used to enrol those actors who were defined in the problematisation of the controversy. These are the materials taken up by the focal actor during the process of persuading the inter-defined actors of the indispensability, of agreed roles and obstacles. The network created by the focal actor becomes stabilised by the use of the devices of interessement. The anchoring of the inter-defined actors by the focal actor is done to block other entities that might have an interest in championing and defining the inter-defined actors for their own black box, from subsuming them.

> "To interest other actors is to build devices which can be placed between them and all other entities who want to define their identities otherwise. A interests B by cutting or weakening all the links between B and the invisible (or at times quite visible) group of other entities C, D, E, et cetera , who may want to link themselves to B. The properties and identity of B (whether it is a matter of scallops, scientific colleagues, or fishermen) are consolidated and/or redefined during the process of interessement. B is a 'result' of the association which links it to A. This link disassociates B from all the C, D and E's (if they exist) that attempt to give it another definition. We call this elementary relationship which begins to shape and consolidate the social link the triangle of interessement." (Callon, 1986b: p. 9)

The formation of particles/ideas/subsumed black boxes/souls of 'B' is given the status of an actor by its association with 'A'. The properties of 'B' are numerous, diverse and immaterial to their/its status as an actor for example they could be non-human. Examples of the devices used in the St Brieuc Bay story could include the towlines made up of collectors which are a series of fine netted bags which prevent young scallops from escaping but also ensure a good flow of water and preservation from predators (used in the Japanese technique). The towline, as a device of interessement is used by the focal actor to persuade the inter-defined actors of their indispensability and of the OPP. As discussed previously, the focal actor cannot persuade the inter-defined actors in repertoire that is contextual to the controversy, so the device of interessement seeks to eventually enrol the actors by creating links with the necessary relationships required to achieve diverse end goals. The towline

extends the hypothesis made by the original entity and confirms the problematisation, inter-defined roles and alliances by proving that the larvae are protected from predators, that the larvae are sown and anchored into the seabed and therefore that the Japanese technique is transportable with the ensuing consequences of economic prosperity for the suffering fisherman.

Figure 4, taken from Callon (1986b) shows the construction of a network at St. Brieuc Bay, formed by the focal actors, the three researchers. It demonstrates the inter-definition of actors and the agreement of the OPP as being the question set forth by the researchers. The successful results of answering the question i.e. the production of the scientific knowledge, is the pivotal factor in ensuring the end goals of all actors are met.

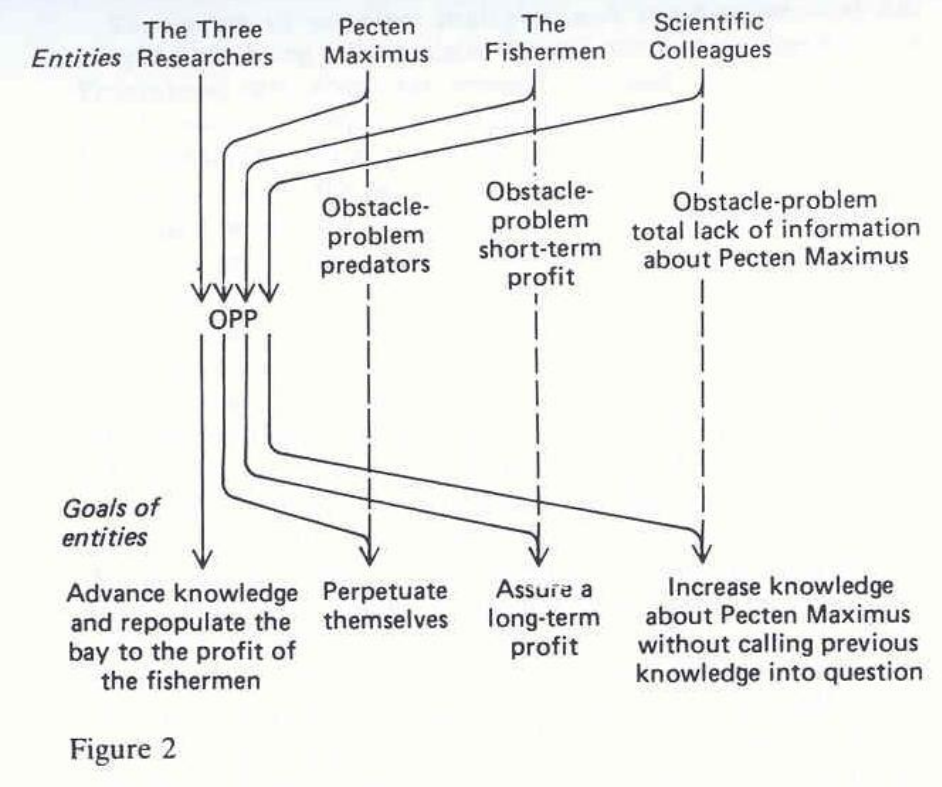


Figure 7 - Showing the construction of the network at St Brieuc Bay, adopted from Callon (1986b: p. 20)

There is no guarantee that the devices of interessement used will be successful in enrolling the actors into the proposed network. Elisha Gray and Alexander Graham

Bell showed that one set of devices could prove more successful than the other. In the St Briuec Bay example, Callon (1986b) demonstrates the difficulties inherent in showing the enrolment of different types of actors (although he does not use the term non-human) and suggests some sort of hierarchy between the enrolment possibilities of the actors who have been inter-defined. He comments that the persuasion of the fishermen is relatively easy as their end goals are simplified to extremes of economic success or poverty.

The scientific colleagues are less simple in their enrolment than the fishermen, but still relatively easy to capture. As a result of conversations and texts between the researchers and the scientific community, the only barrier to the ability of the interessement devices' function is that of their desire to acknowledge the existence of previous work (work used to justify the foundation for the three researchers' initial problematisation). There is a slight call from a 'C' entity with regards to enrolling the scientific community.

The scallops are deemed the trickiest to enrol, particularly given their placement in the world of nature. The scallops must be persuaded to anchor themselves via the transported Japanese technique. This persuasion qualifies the success of interessement devices in enrolling the scallops to a defined network which includes current flows, parasites and adversaries and net-trapping failures. The production of the scientific knowledge is dependent upon enrolling the scallops in the intended way of the researchers but in doing so they contend with 'C' entities which they must disassociate the scallops from.

The intended enrolment of the different actors has been shown to take different forms; the scallops are sought to anchor themselves in the seabed, the fishermen are persuaded that the new trade-tool of collectors will assist in recouping a flourishing stock of scallops for their trade and the scientific community who are persuaded by the idea of the technique itself. However, the intended enrolments and actor definitions are not guaranteed and can unexpectedly transform.

3.3.4 - Enrolment

If interessement was successful, then enrolment has been achieved. Callon (1986b) advises that the issue then, is to transform an enquiry into a "series of statements which are more certain" (Callon, 1986b: p. 10). Enrolment becomes then the bringing together of the efforts which accompany interessement devices; "multilateral negotiations, trials of strength and tricks" (Callon, 1986b: p. 10). Enrolment establishes the set of inter-defined (problematised) roles, the required associations for the dissenter to take control of the black box and the devices of interessement that lock these roles and associations into place. It does not assume or preclude pre-established roles.

3.3.5 - Mobilisation

The fourth point of translation concerns the mobilisation of allies and spokesmen. The three researchers have convinced the scallops, fishermen and the scientific colleagues of the apparent truth about the transplantability of scallop conservation and of the process of the scallop life cycle. They have applied this to all scallops by testing a small number of larvae. Does this convincing statement really speak for such masses? And not even through the scallops themselves? The power of representation to extend the battle for the black box of the scallop life cycle beyond the few larvae they tested in St Brieuc Bay is an issue for the applicability of spokesmen. Power's (2007) "boundary objects" and Robson's (1992) "structures of representation" are similar in their desire to provide platforms for black boxes to be subsumed in wider, more general and in more far reaching networks. The representations of larvae are transported from the context of the controversy (they are no longer floating in the water of St. Brieuc Bay) and are transformed into inscriptions which can find places in the far reaching networks: "the scallops are transformed into larvae, the larvae into numbers, the numbers into tables and curves which represent easily transportable, reproducible, and diffusible sheets of paper," (Callon, 1986b: p. 14.).

Like Latour's (1987) discussion on his assurances of being presented with evidence from a scientist, but rather being shown organised inscriptions, he asks what is coming from the author and what is coming from the collection of inscriptions. He also uses the term spokesperson. Consider the inscription of a heart monitor of a sick patient lying in a hospital bed, surrounded by family and doctors. The doctor sees the stuttering peaks and rises of a red line, the buzzes and beeps of an irregular heart beat captured by the electronic device. These are inscriptions which, when organised, tell us about the health of the patients heart. Without the doctors' presence, the family might have seen enough of daily soap operas to know that a flat line and a lack of beeps is a sign of trouble for their loved one, but still the inscriptions provide the most information when the doctor is there to act as a spokesperson. The electronic device itself should not be considered infallible. Perhaps there was an error by the manufacturer which gives false readings – does the flat line in this instance mean that we automatically assume the patient's heart has stopped beating?

The transportability and mobilisation of allies and spokesmen is the end of a journey which began with the problematisation of the inter-definition of actor identities, OPP's and allies. The taking up of devices of interessement locked the intended roles into place and persuaded those of the indispensability of the focal actor, eventually enrolling other wills with their own. The mobilisation of representatives is questioned and shown to be transported and transformed (as needs be) to reach outwardly. The three researchers have translated the scallops, the fishermen and the scientific community in their own repertoire by acting as spokesmen. The production of the scientific knowledge that was certified is an example of a black boxing story. Like the others already discussed, the end result in the battle for the black box suits the purposes of the particular actors involved in situ and at that general time. In actuality, there are never any real closures, if everything is in action. The tightest of black boxes is still susceptible to challenge.

3.4 - Accounting and Actor-Network Theory

This chapter has so far presented some key definitions used in ANT. The sociology of translation has been outlined both as an exemplar of ANT principles and as the structural roadmap for the thesis framework. Law (1999) described the problem of labelling in ANT and that the richness of semiotics, which it the battle of ANT, is lost in the very act of naming ANT. He also discusses ANT in the context of it becoming a "multi-national monster" (Law, 1999: p. 2) and that in the act of labelling, ANT is both partially connected but amongst different disciplines, it also includes other points of origin.

> "It has converted itself into a range of different practices which (for this is the point of talking of translation) have also absorbed and reflected other points of origin: from cultural studies; social geography; organisational analysis; feminist STS. So actor-network theory is diasporic. Its parts are different from one another. But they are also (here is the point) partially connected. And this, of course, is another way of talking of the problem of naming, the problem of trying to discern or impose the 'ANT'-ness of ANT." (Law, 1999: p. 10)

In order to find out what is particular to accounting and healthcare uses of ANT, a review of literature is thus categorised in respect of Law's (1999) comments. In this section, an overview of accounting's use of ANT is provided.

The proliferation of images and meaning behind ANT as a theory, mean that for this sense-making model to make sense is to frame it in the disciplinary-specific understanding that researchers have translated, a view shared by Justesen and Mouritsen (2011): "actor-network theory, including Latour's own work, has changed over time and it is a body of knowledge "in action". As a result, asking which parts of ANT have been influential and which ones have been less so, is relevant," (Justesen and Mouritsen, 2011: p. 162). For accounting's use of ANT, several authors are prominent Guru's in using ANT in this specific field. Robson's (1992) argument that accounting numbers are inscriptions which can act from a distance by being mobile, stable and combinable, is seminal to unravelling a quantifiable form of

accounting, with an understanding of multiplicity. Robson's (1992) paper is central to later accounting works, both ANT and non-ANT. Robson (1992) is one of the earliest accounting papers to reference the works of Bruno Latour, particularly (Latour, 1987).

The breadth of accounting research which utilises ANT is vast and has been the subject of review papers, see Justesen and Mouritsen (2011) and O'Connell et al (2009). Taking a broad view, the use of accounting and actor-network theory has been diverse. For early studies, see Miller (1990, 1991), Robson (1992) and Preston et al (1992). For management accounting studies, see Lowe and Koh (2006), Alcouffe (2008), Briers and Chua (2001), Emsley (2008), Hansen (2011), Hopper and Major (2007), Hynoven et al (2008), Jones and Dugdale (2002), Lowe (2001), Mouritsen and Thrane (2006), Pipan and Czarniawska (2010), Revellino (2012), Whittle and Mueller (2010). For accounting calculations, inscriptions and networks, see Chua (1995), Cuganesen and Lee (2006), Mouritsen (1999), Robson (1992), Dambrin and Robson (2011), Cuganesen (2008), Joannides and Berland (2013), McNamara et al (2004), Qu and Cooper (2011), Quattrone (2009), Sundstrom (2011), Ushio and Kazusa (2013). For translations and transformations of/in accounting systems, see Llewellyn and Northcott (2005), Mouritsen et al (2001), Dechow and Mouritsen (2005), Quattrone and Hopper (2005), Ahrens and Mollona (2007), Carrington and Johed (2007), Christensen and Skaerbaek (2007, 2010), Gendron and Barrett (2004), Hopper et al (2008), Jeppesen (2009), Justesen and Mouritsen (2009), Justesen and Skaebaek (2010), Lodh and Gaffikin (2003), Rautianinen and Scapens (2013), Skaerbaek and Melander (2004), Skaerbaek and Thorbjornesen (2007).

The choice of ANT Guru has been influential in the accounting literature. Several studies make explicit, the choice of following the works of Latour only for example see Justesen and Mouritsen (2009, 2011) and Justsesen and Skaerbaek (2010). Others have adopted a similar theoretical ANT road-mapping structure of Latour (1987, 2005) and Callon's (1986b) sociology of translation for example see Skaerbaek and Melander, (2004); Carrington and Johed (2007). The fit of Callon (1986b) and

Latour (1987) is somewhat complementary. Callon (1986b) gives a robust structural instruction for researchers. The lengthy works of Latour, the most referenced being Latour (1987, 2005), are complementary to Callon's (1986b) four stage model. In Latour's (2005) discussion of matters of concern rather than matters of fact, I argue that using Callon's (1986b) sociology of translation allows the researcher to pragmatically observe an in action network, whilst still following Latour's (1987) principles and rules of the method. Nowhere in works by the original theorists, will there by an identification of core ANT literature. It could be argued that a point of origin subsumed by disciplines lies in the choice of ANT theorist and the selection of core literature.

Justesen and Mouritsen (2011) conduct a review of accounting papers which utilise a Latourian version of actor-network theory. They argue that the most commonly cited reference, even recent papers, for those who purport to use actor-network theory is Latour's (1987) Science in Action. Justesen and Mouritsen (2011) argue that the more recent works by Latour (1999a; 2004a, b; 2005b, c) offers alternative, interesting and unexplored lines of thought. The authors' critique of the current accounting literature desires greater attention to the evolution of processes as a continual phenomenon. They state that newer lines of thought from Latour would provide researchers with a more subtle eye for making links between accounting and society. While the authors thematically categorise different accounting/actor-network theory literature, they explicitly state that the material chosen for their review is by no means exhaustive, holding true to Latour's (1999a) idea of representation and completeness. The authors have thematically structured various "assemblages" (Justesen and Mouritsen, 2011) of actor-network theory research in the accounting literature, each with exemplary case studies which address different methodological issues of Latour's works.

These thematised assemblages include the "Histories of accounting innovations: action at a distance, inscriptions and the linking of programs and technologies" (Justesen and Mouritsen, 2011: p. 167) which includes Miller, (1990, 1991), Robson (1991, 1992). The second assemblage is "When management accounting ideas travel:

translating new systems in practice" (Justesen and Mouritsen, 2011: p. 170) which includes Preston et al (1992), Chua (1995), Briers and Chua (2001). The third assemblage is "Accounting systems, standards and expertise: re-opening the black box of established management technologies" (Justesen and Mouritsen, 2011: p. 172) which includes Jones and Dugdale (2002), Llewellyn and Northcott (2005) and Gendron et al (2007). The fourth assemblage is "Distance, control and integration: the construction of space and time" (Justesen and Mouritsen, 2011: p. 173) which includes Quattrone and Hopper (2005) and Dechow and Mouritsen (2005). The fifth assemblage is "Networks, organisational boundaries and the role of mediating instruments" (Justesen and Mouritsen, 2011: p. 174) which includes Mouritsen (1999), Chua and Mahama (2007), Mouritsen and Thrane (2006) and Miller and O'Leary (2007). The sixth assemblage is "Emerging markets: the performativity of accounting" (Justesen and Mouritsen, 2011: p. 175) which includes MacKenzie (2009); Callon (2009) and Miller and O'Leary (2007).

The space afforded in a doctoral dissertation does not allow for the reproduction of each study, indeed, as Justesen and Mouritsen (2011) find, this goes against Latour's (2011) ideas of representation. The purpose to which the contributions of accounting's use of ANT will inform the theoretical framework is discussed from and after section 2.6.

3.5 – Healthcare and Actor- Network Theory

The previous chapter detailed concerns for an accounting researcher within a healthcare boundary. In examining how calculative practice is perceived by multiple healthcare actors, it is important to consider the complexity of the empirical site and to avoid the reduction of complexity by assumed accounting centrality. The findings of ANT studies in healthcare add clarity to these concerns and extend an understanding of what Latour (2005) terms "production sites" (Latour, 2005: p. 175):

> "Other sociologists may ignore these production sites as so many transparent intermediaries since, according to their epistemology, they play no other role than to reveal the 'fundamental structures' of human actions, but historians and sociologists of science pay close attention. Ever since we decided to follow how matters of concern are generated by various disciplines, we have to take into account the practical ways through which the knowledge of others' actions is being daily produced." (Latour, 2005: p 175)

A broad view was taken regarding the definition of healthcare. General searches were conducted with health-related terms including 'health', 'healthcare', 'hospital', 'clinic', 'NHS' – in relation to mentions of ANT. Studies included: information systems in healthcare, see Larsson (2010), Cresswell et al (2010), Cho et al (2008), Brooks et al (2008), Greenhalgh and Stones (2010), Moser and Law (2006); Medical Actors and Translation, see Dent (2003), Papadopoulous et al, (2011), Papadopoulous (2011), Hamilton (2012), Brewster et al (2011); medical condition/practice-specific empirical cites of network development, see Veinot (2010), Degeling and Rock (2010), McGrath (2002), Young et al (2010), Preda (2004) and Mol (2002). As with the previous section, the point of departure taken from this literature is to show where it adds clarity to the healthcare concerns for an accounting researcher using ANT.

3.6 - Accounting and Healthcare Issues - Representing Values in Healthcare

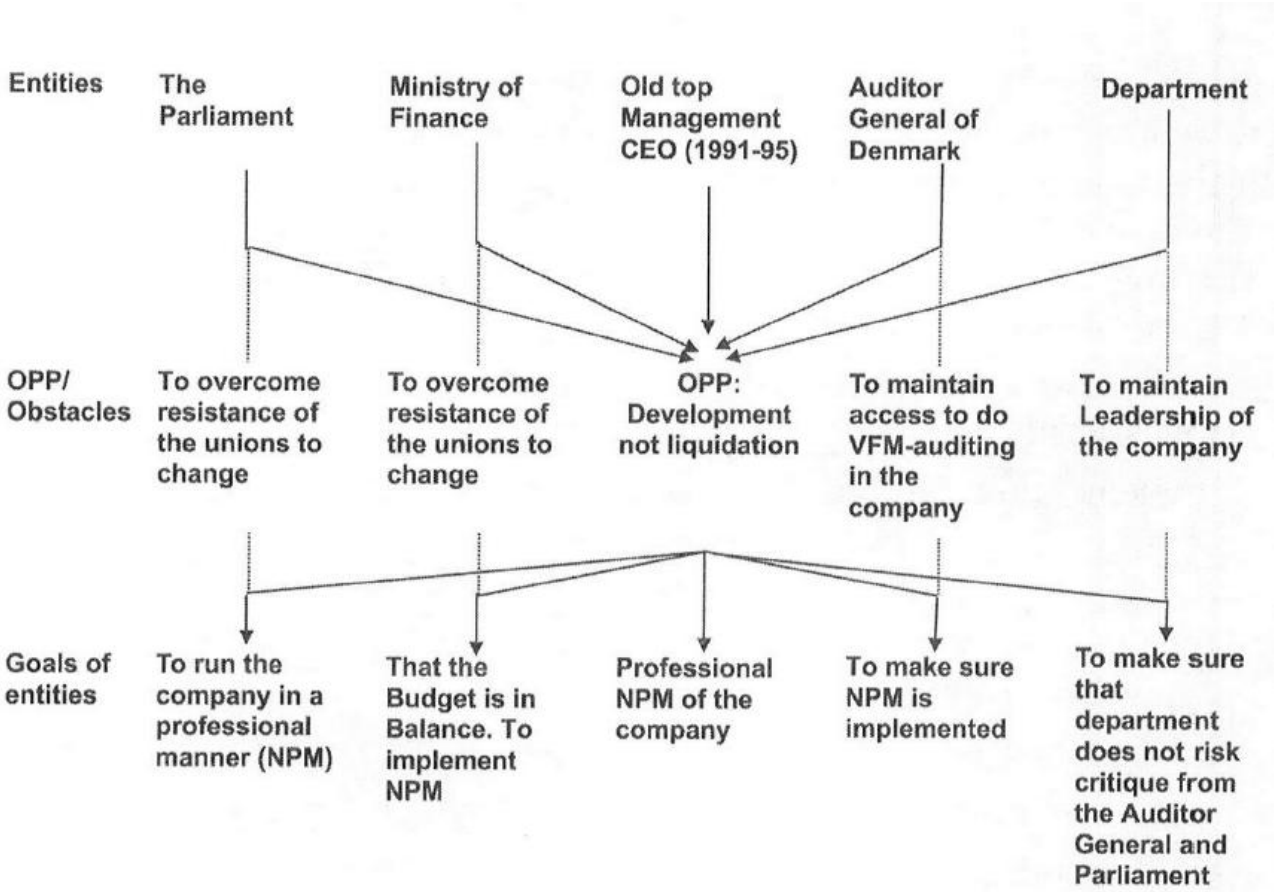
This section will expand the concerns between differences and assumptions of fundamental value systems, as discussed in Chapter One, section 1.2. The previous chapter validated this first concern as the broadest issue. The HTA site is governed by health economics values and principles. The accounting/healthcare ANT contributors will add clarity to how ANT highlights traceable associations in a framed study of the social circumstances of accounting process evolution.

Skaerbaek and Melander (2004) examine the transformations of strategy during a period of significant change in a Danish ferry company. Using Callon's (1986b) sociology of translation, the characterisation of accounting is brought into question

due to the non-support by top management of proposed management accounting reforms. Featured in Figure 5 are Skaerbaek and Melander's (2004) adaptation of Callon's (1986b) OPP diagram, featuring the network of actors involved in the change at the Danish ferry company. Similar to Broadbent et al's (2008) findings on the dominance of accounting-led approaches to risk estimation (and the reduction of other uncertainties in this quantitative centric accounting form), Skaerbaek and Melander (2004) find that those involved in the "political manoeuvre" (Skaerbaek and Melander, 2004: p. 37), which characterised the changing events, utilised accounting forms (inscriptions) as changeable tools. While acknowledging the short time span of the study, the authors trace the actors, tools and events without a dominant accounting assumption:

> "writers such as (Lowe, 2000; Hopwood, 1992, Miller and O'Leary, 1993; Preston et al., 1992) found accounting techniques "as central to the constitution of our organisations" (Lowe, 2000, p. 110), our study gives a mixed view on the centrality of accounting...it is quite surprising how accounting in such forms was identified as being undesired, showing us that there are exceptions to the centrality of accounting" (Skaebaek and Melander, 2004: p. 39).

Citing Lowe (2000), Hopwood (1992), Miller and O'Leary (1993) and Preston et al (1992), the authors question the assumption of centrality in accounting frameworks. The description of accounting "in various forms" (Skaerbaek and Melander, 2004: p. 36) at different times is equated with a timely politicisation of the significant changes in case study organisation. The dissidence of different actors reflects different values held, particularly in the active agents, "politically engaged actors who defined their interests differently" (Skaerbaek and Melander, 2004: p. 37). An understanding of what constitutes accounting, therefore is subject to controversies on form, purpose, motivation. A reflexive form of calculative practice is advocated in this thesis, particularly in relation to the transformative effects of timely politicisation on accepted accounting form. This thesis takes Skaerbaek and Melander's (2004) framework as justification for the structural benefits of Callon's (1986b) sociology of translation, in the production of an ANT account. Figure 5 features an exemplar network diagram for an accounting-specific case study.



The NPM-network

Note: OPP = obligatory passage point

Figure 8 - Showing an example of a Callon (1986b) adapted OPP diagram, in this case the New Public Management (NPM) network developed by Skaerbaek and Melander (2004: p. 24).

Carrington and Johed (2007) contribute to justifying a reflexive form of calculative practice. Dominant accounting ideology and their forms of technology are questioned in their account of how top management was constructed as a good steward during AGM's in Swedish companies. Again using a similar framework to this thesis, Callon's (1986) model is used to examine the devices of interessement that actors used to "close the black box of accounting" (Carrington and Johed, 2007: p. 714). A reflexive and "negotiated" understanding (Carrington and Johed, 2007: p. 722) of accounting is favoured over ideas of centrally focused forms, a similar observation made by Skaerbaek and Melander (2004).

Several studies have used the same ANT literature as the basis for a theoretical framework. The HTA case study is framed using Callon's (1986) sociology of translation for its ANT principles and the pragmatic structure it offers. The HTA case study is also primarily supported by principles from Latour (1987, 2005). Other studies to use Callon (1986b) and Latour (1987) in a similar way include Skaerbaek and Melander (2004) and Carrington and Johed (2007).

In further justifying a reflexive form of accounting in ANT accounts, Mouritsen (1999) adds clarity in a study of the flexible firm in action. Mouritsen (1999) examined two styles of managerial control in her study of the flexible firm in action. The two modes of management control are presented. A "paper form" (Mouritsen, 1999: p. 41), which sought to control manufacturing processes through action-at-a-distance and strongly centralised inscriptions to engender such control. This mode was argued to represent profitability. The other "hands on" (Mouritsen, 1999: p. 41) mode of management control was distinctly tied to the locality of processes, and was argued to represent innovation and flexibility. Mouritsen (1999) found that the inscriptions of the two modes represented variable forms of accounting technologies, but that in both modes the questions of governance/flexibility/customers could not be separated from technological issues. For example, in the paper form of managerial control, the inscription process of informational accounting made several social elements of the firm's activities calculable, controllable and transportable. Forms of accounting are shown to be variable in relation to the duties of actor-identities. The

image of accounting as a pervasive and sustainable calculative entity which fits itself around the organisational context in a best fit approach is put aside in favour of reflexive inscriptions of accountability based upon the characteristics of the actor-network.

The centrality of an accounting ideology in the HTA calculative practices at NICE is not assumed a priori. How different actors perceive calculative practice is considered in terms of different emerging attributes of HTA networking for example diagnostic influences, technical background, tenure. The healthcare issue for the accounting researcher of representing multiple values should give rise to a flexible and contextual understanding of accounting form. As a point of departure and in developing this, the thesis uses Cuganesen's (2008) findings as justification for taking a broad approach to identifying accounting form in a case study. Cuganesen (2008) builds upon Vaivio's (1999) work regarding the calculable space within the organisation labelled as "the quantified customer" (Cuganesen, 2008: p. 81) and the subsequent dissatisfaction with such an aggregated delineation that "the sales customer" (Cuganesen, 2008: p. 81) prevailed. Based on an empirical site at a wholesale financial services firm, in particular the sales and marketing department, Cuganesen (2008) found that two networks existed which enacted mobilisation through the use of differently oriented calculative practices; "numeric calculation networks" (Cuganesen, 2008: p. 91) and a "sales calculation network" (Cuganesen, 2008: p. 95).

The author links the centrality of accounting through its "numeric mode of representation and calculation" (Cuganesen, 2008: p. 80) and states that there is further need for considering the role of accounting (without central assumptions) in calculating customers. The author's foundation for actor-network theory inscriptions is specified as Latour (1987, 1999a, 1999b) and "other ANT writers" (Cuganesen, 2008: p. 82). "Centres of calculation" (Cuganesen, 2008: p. 82) are explained in structuring the masses of information traces brought back. Translation occurs with the combination of such masses of inscriptions into a higher-order that is expressed and reduced through powerful modes of transportation: "totals, averages and

classification frameworks" (Cuganesen, 2008: p. 83). Cuganesen (2008) frames Robson's (1992) seminal work in this manner and attributes action-at-a-distance with power via enacted inscriptions on paper.

> "In the context of customer measurement, management and accounting, those involved in calculating customers through paper-based inscriptions such as accounting numbers (Robson, 1992) are not necessarily weak, despite being far removed from interaction with customers. Rather, they are arguably stronger because using numbers on paper to represent customers and customer performance enables various traces of customers to be brought back to revolve around those doing the accounting, allowing them to act as the centre of calculation. Through inscribing the customer, these centres can make comparisons across different customers, calculate trends over time, and evaluate how others directly interacting with customers are performing in terms of satisfying these customers," (Cuganesen, 2008: p. 83).

A similar process is described in Callon's (1986) description of how the researchers transported the knowledge objects they sought to diffuse via combination and reduction to eventually end up on paper in the hands of their target audience. The presentment of actors in this "micro-account" (Cuganesen, 2008: p. 95), are shown in their attempt to redefine associations in the network pursuant to customer intimacy. The reflexivity of actor-dynamics, particularly in an arena of competitiveness, are shown to create diverse forms of calculation: "Here, the concept of "calculation" was not restricted to purely numeric or economic modes but interpreted broadly, comprising both accounting and other more "implicit" or "tacit" forms of calculation...Specifically, calculations of customers that differed along dimensions of quantitative-qualitative, "hard"-"soft", standardised-flexible and aggregate – individual, were observed," (Cuganesen, 2008: p. 98).

Forms of accounting identified should be taken broadly. Quattrone (2009) argued that the power of "visualising and imagination practices" (Quattrone, 2009: p. 90) aid the ability of accounting inscriptions to engender with the user a "calculative ability which goes beyond simple arithmetic to extend and comprise the possibility of organising knowledge in topical ways," (Quattrone, 2009: p. 113).

This broad view is also justified in Qu and Cooper's (2011) findings on the effects of imagining "non quantified" (Qu and Cooper, 2011: p. 345) features of a Balanced Score Card (BSC). Qu and Cooper (2011) position their field work in answering Quattrone's (2009) call to consider the organisation of signs and visualisations in respect of seeking insight into the constitution of knowledge. Strengths of the paper lie in their articulation of the theory of inscription building, citing Latour (1987) and Robson (1992) as the main points of reference.

The detailing provided in the story of the BSC project is indicative of the content and style of what should be included in an actor network study and helps in part to road-map the minutiae of NICE networking data. The context of the study – Q-care - is described as an "emerging field of healthcare" (Qu and Cooper, 2011: p. 348) that is lacking in terms of the qualities associated with more mainstream areas. The detailing, therefore, of the inscriptions which Qu and Cooper (2011) have identified during the four phases of the Q-care BSC project, expresses the minutiae of information traces that occurred in the networking. The level of detail and form the inscriptions took, for example emails, conference call meeting minutes, BSC project objectives, accreditation standards, multiple flip chart pages et cetera, is very useful in justifying the explication of inscription form in my own field work.

The authors found that not only were the qualities attributed to inscriptions by Robson (1992) stressed, but that other features such as superimposability and diagrammability are important. They found that the success of inscriptions' power to mobilise was tied to the ability of the contextual actor's ability to imagine "non quantified features of a BSC (such as objectives, consensus, access and awareness" (Qu and Cooper, 2011: p. 359). The dependence upon contextual associations renders inscriptions as potentially indeterminate and lacking stability in persuasive power.

There are some studies where accounting researchers produced ANT accounts of accounting practices within healthcare sites for example see Chua (1995), Lowe (2000). Also, see Dambrin and Robson (2011) for an ANT study on networks of

performance measurement within the pharmaceutical industry. In respect of the issue of representing multiple values in healthcare, it is worthwhile stating that this could extend to qualifying the differences between authors: Chua (1995) chooses not to consider the presence of non-human actors as opposed to Lowe (2000). Chua (1995) narrates the implementation of DRGs at three Australian hospitals and the battle for accounting dominance in their implementation.

At the time of writing, Chua noted that the sociology of science type of literature was attractive for several reasons. The construction of new accounting numbers and the ensuing battle for dominance in their indoctrination is akin to scientific controversy (Chua, 1995). Also, it did not assume that the construction of a technology – such as a set of new accounting numbers – was attributed with an already diffused and accepted rationality. The new accounting numbers in this instance were the inscriptive tools used to define and therefore control the output of the hospitals. The case-mix of a large body of new inscriptions – in the form of the DRGs – created new mechanisms by which action could be controlled at a distance. Chua's (1995) writing is reflective of the style of Latour in that the structure of the paper is very much that of a narrative – a story which traces the minutiae of how the fact-building network emerged.

Lowe's (2000) fieldwork is similar to Chua (1995) in that he examines the translation and transformation of a case-mix accounting system (DRGs) in a New Zealand hospital network, but he critiques Chua's (1995) disengagement with one of actor-network's central tenets: the symmetrical consideration of the agency between all actors, human and non-human. Informed by key works of Callon and Latour, Lowe's (2000) study highlights the complexity and layered dimensions to the networks which transition the new accounting system towards a black boxed fact. He articulates different boundaries around the requirements for the translation of the accounting system, albeit at different contextual levels.

> "Transition can be seen as part of a much larger network outside of the hospital, and also as part of a complex network within the

> hospital. The Transition system draws information from many sources within the hospital and provides links between many different groups of health professionals and other support, accounting and managerial staff. Outside of the hospital the network can be seen to consist of other hospitals using the system around the world, the Transition systems organisation and its personnel, and a mass of technical and other literature which has been written in relation to the system and its effects. It is this network which provides support to new users. Indeed, it is as a result of this network that the system spreads more and more widely and enrols more institutions and people into its constructions of reality, its "facts". There are several issues which arise out of the significance and extent of these networks. The process of translation can be observed to operate at different levels. Though this paper has concentrated on describing the effects of enrolment, particularly within the hospital, similar effects are also taking place outside of the hospital when we view the hospital as just one node within a much larger network which takes in the Transition organisation, other health providers and funders across the world and the technical literature," (Lowe, 2000: p. 84).

Lowe's observations are accurate but have the potential to be dizzying. The locus of actor-network accounts should be considered in what Latour (1999) describe as this bizarre "topology of the social" (Latour, 1999: p. 18). Lowe (2000) addresses the danger of crossing pragmatic boundaries with a strong articulation on the function of the spokesperson in enabling control from such wider networks, from a distance. The HTA fieldwork benefits from the insights Lowe (2000) offers on the form of accounting inscription and the clarity with which he utilises the actor-network concept of black boxing. However, in regard to both Chua (1995) and Lowe (2000), the HTA fieldwork will have a greater focus on the personal translations of medical enrolment as the healthcare setting is not so easily problematised as in a simpler hospital setting.

Lowe (2001a), citing Woolgar (1988), Clegg (1995), Law (1997), Callon (1986), Bloomfield and Best (1992), Bloomfield and Vurdubakis (1997) and Latour (1994), builds on the clarity of black boxing as an actor-network concept and also on the importance of retracing actors without reducing them in your words or speaking for them i.e. the symmetrical consideration of agency to all actors. His articulation of

how he achieved this is typical of an adherence to Latour's (1987) principles of the method:

> "In order to provide an interpretation which is symmetrical (Callon, 1986; Woolgar, 1988; Clegg, 1995; Law, 1997) it is necessary to try to represent the role of accounting systems and techniques directly. By direct I mean that the author must seek ways of showing the powerful and constitutive nature of such systems of representation, in ways in addition to the quotes of participants. This is consistent with Latour (see also Bloomfield and Best, 1992). It is appropriate to consider how best to provide data to explicate the manner in which technology takes over some of the decisions of human actors or affects the direction of groups in society or organizations. Clearly we cannot rely on what participants say since the whole issue of the impact of technological systems and inscriptions is their pervasive, rather than directly intrusive character (see Bloomfield and Verdubakis, 1997b, for a discussion of 'framing' devices. Latour (1994) argues that it is not possible to 'study technical skill directly', that we are still concerned with 'meaning but no longer in discourse' (p. 39),' (Lowe, 2001a: pp. 83).

This articulate clarification justifies a dual methods' concern. Firstly, that the explication of heterogeneous researchers' journey in following the actors is something that is given importance consideration by all actor-network researchers. Secondly, that each researcher is ultimately their best judge, and can only be guided so far in how to road-map such journeys.

3.6.1 - Section summary

In this section, the discussion focussed on how ANT studies might add clarity to interpretations of accounting, both by the researcher directly and from analysing evidence from contextual actors. Accounting as a distinct ideology is rationalised in ways which avoid total domination of context into something calculable but also transport some inscriptions which convince an accounting audience. Robson's (1992) "action-at-a-distance" is recognised as the basis for powerful inscriptions. However, accounting boundaries should be pragmatic and taken with a broader view of calculative form. The powerful accounting inscriptions should not stymie a reflexive

accounting interpretation, which can be translated directly by the researcher and not just through the actor's words (Lowe, 2001a). The use of Callon's (1986b) sociology of translation model, coupled with key insights from Latour (1987, 2005) is justified and is supported by accounting studies such as Skaerbaek and Melander (2004) and Carrington and Johed (2007).

3.7 - Accounting and Healthcare Issues - Healthcare/Empirical Complexity

This section will expand the issue of reducing contextual complexity in calculable terms, from a priori assumptions of accounting's centrality. Following from the issue of representing multiple values in healthcare, the inherent values of accounting ideologies are discussed in terms of their assumed centrality. A reflexive form of calculative practice is advocated within a framed study.

Christensen and Skaerbaek (2007) are reliant on the works of Michel Callon, with no Latour citations. Using case studies of Australian and Danish public sector organisations, the authors sought to examine the reductionist consequences of the reporting relationships inherent in the organisational factions, during a process of implementing new accountability innovations. In line with Callon's (1998) ideas of framing and overflowing, the authors ultimately showed that the perspectives of two parties in a reporting relationship steadily distanced themselves from associations with the external audience, and instead locked them into place and reduced them. In the case of these particular instances, there was no destabilising controversy from such reductionist treatment, in line with the contextual politics, however this is due to the timing of the study data.

Christensen and Skaerbaek (2007) dispel the critique of a-political actor-network accounts by making the very nature of the accountability innovation a device of interessement in a wider set of rules for institutional politics. An interesting point of departure that I particularly take from this study is the implications that they make regarding the time dimension of innovations (Christensen and Skaerbaek, 2007).

They state that an interesting longitudinal case study that examines the transformations of the accountability reforms past the innovation stage might shed light on the current lack of destabilising controversy and that "its theoretical frame may also prove useful in extending the research beyond the public sector to understand the “word crafting” leading to obfuscation that has been identified in Chairman Addresses in company annual reports," (Christensen and Skaerbaek, 2007: p. 127). The length of time of the study data, if lengthened is suggested to favour instances of reduction that lead to "obfuscation" (Christensen and Skaerbaek, 2007). The length of timed studies is also relevant to the case-studies conducted at NICE, with future research implications for the longitudinal study of the implications of value based pricing on HTA calculative practices.

Christensen and Skaerbaek’s (2010) study examines the processes by which consultancy outputs (seminars, presentations, briefings et cetera) are used to cultivate social conflict. The black boxed form of action-at-a-distance accounting versus reflexive forms is demonstrated, for example, in the discussion on the use of consultancy seminars that seek to legitimise accrual accounting over cash-based accounting:

> "by contrasting accrual accounting with cash-based accounting and simultaneously criticizing the latter, it was possible to argue that cash-based accounting was impure whilst accrual accounting was pure. Thus, images of parlous administration (‘piles of garbage gathered on the street’) helped establish that cash based accounting was problematic and even illegitimate," (Christensen and Skaerbaek, 2010: p. 532).

With similar implications for future longitudinal research as their earlier paper (Christensen and Skaerbaek, 2007), the authors justify the need to examine the processual contribution of consultants to the creation, transformation and stability of accounting systems by juxtaposing the growing numbers of consultant activities. This articulation coupled with the comments they made regarding the recreation of the events and resources required during the network-in-action, mirrors the justification in this thesis for an actor-network account that examines the HTA

process. It is interesting to note the evolution of Christensen and Skaerbaek's work to include the works of Latour (1987, 1993, 2004, 2005), which is reflected in their articulation of the study-timing issue and non-human actors.

McNamara et al (2004) contribute to points of departure regarding organisational complexity and the added clarity which an ANT framework would bring. Their field work concerned how organisational knowledges were constituted in an Australian multinational consumer goods company. The paper advances the question on the centrality of accounting inscriptions (i.e. black boxed accounting forms) and instead considers them in a wider constellation of organisational knowledges (McNamara et al, 2004). The authors acknowledge Latour (1987) as the main source of actor-network insight. The research methodology is typical of actor-network studies but it is interesting to note that despite impressive looking numbers of non-interview methods (participant observations and conference observations), the authors acknowledge that they draw most heavily from the interview data. This adheres to general actor-network principles of not speaking for actors (Callon, 1986b). The authors found that knowledge networks were constituted by and of local logics which steered activities and sense-making within the firm. They advocate that "non-realist" (McNamara et al, 2004) methodologies would perhaps better reflect the reflexive relations between the knowledge object and those who it is constituted for/by/of:

> "our research presents knowledge management as a polysemic enterprise: a variety of knowledge objects and knowledge management strategies characterised organisational functioning at Foodco. At a practical level, this stands in contrast to hegemonic strategies which advocate a 'best way' or particular solution to knowledge management. From a disciplinary point of view, our field study also highlights the potency of non-positivist methodology, such as actor-network theory, to subvert realist accounts of knowledge management by constructing co-dependency between a knowledge object and those actants connected to it,"(McNamara et al, 2004: p. 67-69).

The justification for heavy reliance on interview data and the "potency of non-positivist" frameworks guide the approach taken in the research methods and

analysis of calculative practice perceptions of the healthcare players involved in HTA decision making at NICE.

The length of time spent observing networks, in accounting studies which use ANT, is often described as relevant to mapping a translation in-action. The complexity of contextual controversies is often argued to challenge the robustness of any conclusions drawn about a translation account. The link between the time length of observations and the ability to trace associations in complex empirical sites is essential in understanding the stabilisation of accounting frameworks from controversy to fact. In the context of healthcare, Papadopolous (2011) addresses the length of observation time with regard to in-action translations. Papadopolous (2011) found that the use of an actor-network approach highlighted the importance of employing a continually translating analytical process which would gradually enrol opposing actors to Continuous Improvement (CI) and which would foster the necessary behaviours required for the new measured outputs of lean thinking.

Lodh and Gaffikin (2003) produced a longitudinal study of the implementation of an integrated accounting and cost management system at a major steel produce in Australia. They argue that the longitudinal approach demonstrates the incrementally continuous translation process required to both implement and maintain the system. Their research methodology articulates a strong desire to document an in-action implementation change in a large organisation. The study was particularly apt at demonstrating the timing issue which takes black boxes from in-action to fact, and that the process of translation – driven by the strength of associations and actor identity construction - can often result in unexpected enrolments:

> "It is clear from our study that there are many stop/start syndromes in a major change. That is, when the actor-networks (both human and non-human) of any complex change cannot be visualized with certainty, to mobilize the change processes further it is factors such as complexity and invisibility that were to blame. Thus, keeping actor-networks in line and managing change are a crucial part of implementing/fabricating any accounting information system in

> organizations. Change is not just a constant; rather, it is an outcome of a continuous translation process," (Lodh and Gaffikin, 2003: p. 115).

Further establishing the time dimension issue of observation length, Gendron and Barrett (2004) use the term longitudinal when applied to a case study, as did Lodh and Gafikin (2003). The term longitudinal, is taken by this thesis to describe the time length of observations to be significant. The networks being observed by different authors and the claims made regarding the robustness of in-action practices observed should be considered in line with ANT ideas regarding time and semiotics. Black boxes are never truly closed and facts only become so after claims for the box have been made: "the fate of what we say and make is in later users' hands," (Latour, 1987: p. 29).

Gendron and Barrett (2004) explored the attempts of American accounting institutions to build upon claims to expertise knowledge to create a niche market of e-commerce assurance through the WebTrust project. The claim to professional expertise through this medium is based upon Latour's (1987) discussion on machines and technological innovations as knowledge claims. Their findings were similar to Lodh and Gafikin (2003) in terms of the unexpected ways in which the in-action network of support around the emerging knowledge claim, manifested. The process of trying to legitimise WebTrust with target audiences resulted in a reflexive translation by its accounting proponents. The unforeseen perceptions of WebTrust were continually monitored and used by institutes to navigate an evolving structure that would be a "suitable fit between their claim and the interests of targeted audiences" (Gendron and Barrett, 2004: p. 590). The intended matter for black boxing i.e. the WebTrust, unexpectedly came to be associated with "alternative solutions" (Gendron and Barrett, 2004).

The lack of ruling centrality in the market place for this particular knowledge claim was argued to paradoxically benefit the stability of it, as it was continually seen on the periphery; "the claim's lack of visibility may render it more difficult to be dismissed by sceptics, who are confronted with a representation of performance

predicated on the collective experience of accounting firms in using and adapting the criteria," (Gendron and Barrett, 2004: p. 593).

In reference again to the time issue of observation length, Briers and Chua (2001) add clarity to the idea that the ability of control frameworks to satisfy actors, of accounting for complexity, is in the hands of later users. Framing the story of success or failure in a similar sense to the way Callon and Latour (1981) discuss EDF and Renault, Briers and Chua (2001) do not fail to add the timing issue to their network observations: "In our story, powerful heroes or machines are built out of fragile, heterogeneous networks, and a triumphant technology might only be king for a relatively short time," (Briers and Chua, 2001: p. 240). The movement from the local context to global reflects Latour's (1999) total locality and local totality in terms of the circulating agency. Accounting technologies are observed to have the status of being non-human actors/actants. The navigation of organisation boundary is the focus of this study.

The adoption of management accounting changes by an organisation is shown to be influenced by a diverse actor-network of both local and global actors. Briers and Chua (2001) have an interesting approach with the distinction between local and "cosmopolitan" actors. They define cosmopolitan actors as being global and are adroit at permeating "spatial and cultural boundaries" (Briers and Chua, 2001: p. 241). Emphasis is placed on two ways in which they achieve this quality. Firstly, cosmopolitan actors often work for global chains or have strong representative links to them. Multinational resources forge alliances in the implementation of changes made, by cosmopolitan actors. This means that technologies are quickly labelled as "transnational" and can permeate spatial and temporal boundaries. Secondly, the cosmopolitan actor uses a complement of boundary objects, which act to link together actors who have diverse goals but which are capable of multiple meanings amongst actor groups. Briers and Chua (2001) found that there were five boundary objects which could stabilise organisational accounting systems in the face of management accounting change; data repositories, visionary objects, ideal type

objects, coincident boundaries and standardised protocols. Their findings, supported by Latour (1987), reflect the minute traces followed in observing a network in-action. The success or failure of an accounting system is an example of a black box which cannot be truly closed. The later users will continue to determine the apparent success or failure of accounting system practices, a contribution Briers and Chua (2001) state as a reflection of following informational traces symmetrically:

> "An important contribution of this study, we feel, has been an attempt to treat symmetrically, the constructed nature of technological success and failure. Rather than argue that accounting systems that succeed are those that 'fit' the strategic imperatives of dominant stakeholders, this study argues that success and failure is a fragile construction that turns on the strength of diverse ties tying together many heterogeneous elements." (Briers and Chua, 2001: p. 267).

I take Briers and Chua's (2001) point on symmetrically following information traces. Callon's (1986b) model requires that the observer follow such traces symmetrically and with no a priori assumptions about the context. The perceptions of calculative practice, by healthcare players involved in the HTA decision process should be observed without assumptions as to who is a dominant stakeholder.

The complexity of empirical sites and the ability for accounting researchers to use ANT to both identify technologies of accounting and gauge their stability can be clarified in terms of framing and boundary objects. From Macro to Micro, from one context to another, Latour (2005) describes the "third move" of connecting sites.

> “What happens when we practice the two gestures together – localising the global and distributing the local – *together*? Every time a connection has to be established, a new conduit has to be laid down and some new type of entity has to be transported through it. What circulates, so to speak, ‘inside’ the conduits are the very acts of giving something a dimension. Whenever a locus wishes to act on another locus, it has to go through some medium, transporting something all the way; to go on acting it has to maintain some sort of more or less durable connection.” (Latour, 2005: pp. 219-220)

In the context of the accounting researcher, who must have some natural bias and motivation for conducting a study, there are pragmatic issues of boundaries around the case. What circulates inside these boundaries? What is transported in the meaning of labels such as accounting? Latour's (2005) third move in assembling the social involves this two way circulation of considering the framed contextual issues and transporting black boxed accounting ideas.

This thesis advocates a reflexive form of calculative practice, but is there some quality inherent in that understanding that makes it a durable explanation for accounting ideologies? Rautianinen and Scapens (2013) consider these issues and conclude that accounting concepts can be understood as boundary objects. They conducted a case study within a Finnish city to examine organisational and accounting change, contributing two new conceptual ideas of "dynamic agency" and "constrained transformation". Citing Latour (1987, 2005) as the main basis for producing an actor-network account, the authors propose that there are complementary insights to be offered by combining perspectives from actor-network theory and New Institutional Theory (NIS).

Comparing the two models, the authors demonstrate similarities and points of departure, with particular attention paid to "taken-for-grantedness" (Rautianinen and Scapens, 2013: p. 107) (of institutions and black boxes), OPP's (compared with routines, path dependencies and coercive pressures) and with a strong distinction made between the two models in their approach to the human/non-human transformation. The non-human issue is not something which is explicated/sectionalised very often in the accounting literature covered so far, however Rautianinen and Scapens (2013), citing Modell (2009), Briers and Chua (2001) and Hopper and Major (2007), are articulate in critiquing the issue and offering a fresh interpretation based on dual theoretical insights:

> "Accounting tools can be understood as boundary objects (Briers and Chua, 2001; Hopper and Major, 2007), or a specific accounting system is, in ANT terms, an active agent, or an actant, transforming the human actors (Modell, 2009)...We suggest a categorisation where,

> for example “profitability” and “cost-effectiveness”, are boundary objects and then the actual accounting tools intended to support these aims become non-human actors (the-guns-in-the-hand), once they are adopted," (Rautianinen and Scapens, 2013: p. 109).

What meanings are attached to the label of complexity? The premise of this thesis is that the minutiae of HTA protocol can be traced in terms of associations along the network of healthcare players involved in decision making and evidence giving. An abiding assumption has been that the clinical profession is too far removed from traditional accounting ideologies; what is tradition, however? The complexity of a chosen case organisation, and the ability for the accounting researcher to trace associations of accounting technologies/systems within a framed study should perhaps be subject to another level of critique. The strength of associations with the field of complexity and the accounting profession should be noted. Cuganesen and Lee (2006) conducted a study which focussed on the impact of information technology on control mechanisms in procurement networks. The inscriptions of information technology are examined in order to open the black box of its effects on the formation of control, as the authors note that the extant literature of the time was formative on the subject. The inclusion of their case-study firm - MroNet - in a procurement network is examined for effects via informational traces and the reflexive impact of the network in action are realised in their effects:

> "In summary, the consequences of including MroNet in the actor–network had consequences other than those primarily intended by SSGs. At an inter-organisational level, the ability of the data warehouse to inscribe and make visible performance provided benefits to both buyers and suppliers. These information traces facilitated the construction of SLAs and accounting performance measures with greater levels of specificity. Paradoxically, the emergence of more complex and detailed accounting controls generated a key benefit for suppliers. The increased specificity of the contractual and accounting controls enabled suppliers to better ‘demonstrate’ their performance to buyers and act upon buyers. They were better able to respond to their previous ‘invisibility’ and potential for ‘oblivion’ when buyers had relied upon tender processes alone as the primary inscription device to calculate their performance," (Cuganesen and Lee, 2006: pp. 163-164), SSGs = Strategic Sourcing Groups, SLAs = Service Level Agreements

The rendering of visibility, particularly as a benefit, that resulted from the utilisation of detailed accounting controls is particular to the context of the study. Briers and Chua (2001) found that the visibility provided by accounting inscriptive devices was sporadic. In their study, there was always a "data/information gap" (Briers and Chua, 2001: p. 267). As new management accounting changes circulated through the heterogeneous network, crossing the organisational boundary, actors found that attributing data to particular inscriptive devices (which were linked to the timing of old and new technologies) was a frustrating process. The particulars of the social, political and economic context of a study site will be present in the organisational associations which create and sustain boundaries.

Healthcare complexity and "qualculability" (Moser and Law, 2006: p. 59) are the subject of Moser and Law's (2006) study on ICT networks in healthcare. The network of informational inscriptions, for example phone calls, meetings, conversations, generated from everyday medical practices do not fit in rigidly framed boundaries. The need to consider information-relations in both flow and fluid terms is argued by their framing of "calculations" and "judgements" (Moser and Law, 2006). Calculation is seen as something mechanical which requires objective, codified information that is transportable and rigid. This is distinguished from judgement which is seen as an art form of subsuming information, which is extremely rich in context and is less mobile for its lack of rigidity or fluidness. Although the two are polarised/dichotomised, Moser and Law (2006) argue that they have much in common, being that both are simply controversies which have rendered boundaries (i.e. inter-defined identities for enrolment) on what constitutes information:

> "we are arguing that judgement and calculation both work by arraying and manipulating entities within a single spatio-temporal frame. In this way they achieve what we will call qualculability. But notice what we have done in bringing these together. We have implied that even in calculation, the frame and its boundary-making are variable." (Moser and Law, 2006: p. 59).

The healthcare literature is identifying its complexity. The issue of calculability in mechanical or art terms is very relevant to justifying a broad, non-expert view for analysing healthcare player perceptions of calculative practice at NICE.

Greenhalgh and Stones (2010) also justify a broad view to calculative practice in health care in associating the variable success of IT technologies being enrolled in different health care sites. The importance of context is emphasised in establishing a technology's fate: "the same technology may meet the former fate in one setting and the latter in another," (Greenhalgh and Stones, 2010: p. 1286). A broad view and the importance of context are discussed by Preda (2004) in his study of the construction of Acquired Immune Deficiency Syndrome (AIDS) rhetoric. The repertoire of a complex health site cannot be exclusively dichotomised between scientific and lay understanding. This is of particular relevance to the NICE data as the perceptions of actors with varying technical knowledge do have an effect on perceived calculative practice. While not specifically utilising ANT, Preda (2004) discusses Latourian concepts of translation in the rhetoric between science and lay-person centred knowledge communities on the journey of AIDS rhetoric from the 1980's onwards. The differences of repertoire between those with technical knowledge and the wider public are argued to be able to create a sustained dialogue of rhetoric as opposed to closed off black boxes.

In a similar way to Preda (2004), whilst not explicitly using ANT, Mol (2002) references multiple works of Latour (1987, 1988, 1993, 1996) in her ethnography of atherosclerosis. This single disease is also multiple entities, its definitions described within the practices which enacted it. Mol (2002) addresses the politics of the healthcare setting. The centrality of healthcare concerns are challenged. The technicalities of a given context are technically undetermined.

> "…in the quantitative research tradition of the trial, the question about what gives life quality and what does not is still taken up in a quasi-naturalising way. A sociologizing way, or so one might say. What the *good life* might entail is not recognised as an essentially contested and thus a political issue…quality turns into quantity. Values are turned

> into facts, social facts. All the controversies around the question of what a *good life* might be are stifled. That people have different investments in life, that we clash when it comes to striving after the good, is turned into a mere calculative challenge." (Mol, 2002: p. 174) note italicized in original

Mol's (2002) ethnography within a healthcare setting reveals political circumstances around the multiple entities of a single disease. The findings above are relevant to the accounting and healthcare concerns found in chapter one. The ability of accounting to mediate the multiple interests of diverse healthcare actors depends on the extent to which healthcare complexity has potentially been calculably reduced. In HTA, the controversy surrounds the consistency of applying controlled from a distance calculative practices across multiple disease areas. In asking research question one, I am using ANT to show how people's "different investments" (Mol, 2002; p. 174) are represented in the clinical decision making process of HTA.

Some of the healthcare literature which uses ANT describes the stymieing effect of perceived traditionalism within the clinical profession, on mobilising novelty and innovation in complex clinical controversies (as developments). Young et al (2010) and Degeling and Rock (2010) contribute to the idea that such networks need to translate the interests of other healthcare professionals as opposed to even more disparate actor identities, for example the accounting profession. Degeling and Rock (2010) document the journey of Haemoglobin A1c becoming accepted as a diagnostic tool. Similar to Latour's (1987) exemplification of Schally's work in dissenting the accepted standard of beta-chains of haemoglobin, Degeling and Rock (2010) build upon the increasing use of actor network in highly practical applications. Informed strongly by Young et al (2010), the authors articulate the use of actor-network theory as a theoretical lens in medical literature.

> "Actor-network scholarship has generated important insights about links as well as gaps between clinical practice, epidemiological research, and programs within and outside the health care sector...as expertly demonstrated by Young et al...when ideas and things are part of highly complex systems, they are typically limited by a repertoire of established responses. Changing the evidentiary status of HbA1c

> from a useful measure of control and risk to a diagnostic criterion and screening technology is therefore a significant step that will reshape the network of concepts, values, practices, and actors that drives efforts to prevent, diagnose, and effectively treat type 2 diabetes," (Degeling and Rock, 2010: p. 101).

The change in the accepted standard of HbA1c is an example of a practical dissension. Degeling and Rock (2010) are reopening the black box and are reallocating the components that rendered HbA1c as a useful tool and are redistributing them to create a new diagnostically relevant tool.

3.7.1 - Section Summary

This section expanded the issues surrounding empirical complexity. The clarity which ANT frameworks provide in structuring an accounting-based study are discussed. The length of time of researcher observations is important for observing in-action translations of accounting phenomena, particularly in complex settings. Latour's (2005) third move is demonstrated in the advocating of a reflexive form of accounting that utilises accounting boundary objects. Calculative practice is again rationalised to necessitate a broad interpretation and should not privilege positivist forms (McNamara et al, 2004). Unexpected transformations can be witnessed in complex networks (Lodh and Gaffikin, 2003). The empirically complex site should be considered in terms of potential strength of associations that already exist with the accounting profession. In particular reference to healthcare literature, the black box of science and of "established responses" (Degeling and Rock, 2010: p. 101) are argued to potentially stymie innovation and development.

3.8 - Accounting and Healthcare Issues - Mobilising Accounting Practices within a Clinical Boundary

This section will expand the accounting and healthcare issues relating to the mobilisation of accounting practices within the clinical profession.

Skaerbaek and Thorbjonsen (2007) examine the process of enrolment in the Danish Defence League (DDF) of a strongly institutional accounting ethos (DeMars) that is part of a requirement for the role of officers. As with Skaerbaek and Melander (2004), Skaerbaek and Thorbjonsen (2007) use Callon (1986b, 1998) to structurally roadmap their theoretical framework. This is in contrast to other authors such as Justesen and Mouritsen (2009, 2011), who use Latour's works. Skaerbaek and Thorbjonsen (2007) found that the institution of accounting was actively beset with devices of intersegment that sought to lock soldiers into a hybrid identity of active martial duties and managerial responsibilities. The authors contrasted their findings with Jacob's (2005) concept of "polarisation" and "absorption" and found that the devices of interessement locked the identity construction of officers to such an extent, so quickly, that there was no room for a slower absorption and eventual enrolment of the new system:

> "To analyse the implications of accountability arrangements to professional identity is not only about studying the acquisition of abstract accounting knowledge through formal education. It is also about how the deployment of various accounting and auditing devices participate in framing various groups such as officers," (Skaerbaek and Thorbjonsen, 2007: p. 265).

The political movement that controlled the accounting devices of interessement is argued to have been too quick for successful enrolment. Skaerbaek and Thorbjonsen (2007) confirm the need for another research enquiry, into how accounting devices are used to frame identity groups.

Dechow and Mouritsen (2005), focusing on Latour, examine two companies who attempt to merge with the use of an Enterprise Resource System (ERP) that has an

assemblage of boundary objects which aid a synergy in-action. The notion of control cannot be separated from the organisational context. They find that the ERP renders visible the limited scope for integration and that it is more a problematising activity than an achievable goal. This finding, the authors find to be the most interesting aspect of the ERP system study; not what it is capable of doing but rather what it renders as impossible. As a point of departure, the merging is likened to hybridisation of two distinct networks. In this instance, the authors found that it was a "problematising activity" (Dechow and Mouritsen, 2005: p. 729) as opposed to something achievable.

Quattrone and Hopper (2005) use an actor-network framework to examine the different transformations of two uptakes (Sister Act and Think-Pink) of an Enterprise Resource Planning system (ERP) of accounting. Central to their framework is Robson's (1992, 1991) philosophy regarding accounting numbers and action at a distance. In one case study, the ERP subsumed existing associations and thus allowed the maintenance of conventional accounting controls based on action at a distance (Quattrone and Hopper, 2005). The second case study showed how the ERP was used by Think-Pink to collapse distance and engender strong notions of global integration minimalist control. The authors contribute to the transformation of the idea of taken-for-granted-terms such as local, global et cetera. In regards to the second case study, they describe how ERP necessitated a reification of such black boxed terms in manners which were familiar.

> "ERP necessitated rethinking what was 'local' and 'global'. In the 'good old days' accounting inscriptions may have had different meanings for different people but they granted local discretion and people had shared meanings when accounts' were consolidated monthly. Then 'Globalisation' was just a fashionable word for many employees – now it was a pressing problem...re-ordering – to make things tidy again – was hard. Learning the advantages of controlling by ERP and how to track mistakes back took time...Consequently, managers translated the integration ideology into something more familiar. For example, they restricted access to data entry and information: many areas became accessible only be passwords...Thus managers made new "inscriptions" defining who could do what," (Quattrone and Hopper, 2005: p. 758).

The managers are shown to translate the ideology of integration and invent new inscriptions which help lock familiar boundaries of the locality into place. Quattrone and Hopper's (2005) discussion on localities would be helpfully informed by Latour's (1999) description of the strange "topology of the social", of its "space" and of "total localities" and "local totalities" (Latour, 1999: pp. 18-19). The integration ideology is sought to be actively defined and controlled by managers in very local terms. Approaches to the resistance of the clinical profession (or more generically, the contextual profession) to accounting ideologies should consider the way in which management locked local definitions into the ERP integration. The accounting and healthcare issues can be shown here; the differences in fundamental values in the face of complex empirical sites are challenged when dominant accounting ideologies fail to centrally consider the case organisation and actively reduce complexity in order to achieve calculability/quantifiability from a distance.

Several healthcare studies have used ANT to show that translating new technologies (or controversies more generally) into practice involves reframing established actor identities and relationships, for example doctor/nurse hierarchies. Resistance to enrolling new duties and relationships highlights both the broad view required by the clinical profession – to synthesise change – and the time length of observations of the in-action translations.

Cresswell et al (2010) explored the role which technology plays in shaping social processes, conceptualising the role of the medical record and how the role is active in forming power relationships between actors. The changing nature of the system, from paper to electronic, is mirrored in the relationship between clinicians and nurses. The paper artefacts (textual inscriptions) acted as a deputising technology which enabled the clinician to mobilise their authority via the nurses in order to order x-rays (via their signature). This was not possible in the new system which meant that the nature of that small relationship had changed, whereby the clinician had to order the x-ray themselves.

Cho et al (2008) presented their research interests as concerning the need to understand the relative delay in IT exploitation by the health care industry. Cho et al (2008) used "events" (Cho et al, 2008: p. 615) of "encounters" (Cho et al, 2008: p. 615) to explore what the dynamics, related to implementation content and context, had to reveal about the tensions between the radiology network system and necessary medical activities (work practices). In capturing the events, Cho et al (2008) referred to the notion of “traditional” (Cho et al, 2008: p. 620) within the actor-world. They followed Callon’s (1991) ideas on irreversibility which concerns the degree to which the social domain within the controversy can be less black boxed and presents alternative possibilities. In capturing their events of the actors in the radiology actor-world, they referred several times to the implacability of actor resistance due to the strength and rigidity that certain forms of inscription had for the implementation of medical practices for example,

> "...the decision to replace the traditional paper-based radiology network system with a new electronically integrated system...the new system challenged established professional roles and identities, specifically concerning how work and responsibilities were divided in the traditional orthopaedic work practices as inscribed into the paper-based system" (Cho et al, 2008: p. 621).

This study explored the ability of inscriptions to transport the original intentions of the controversy (for example the introduction of the new electronic system) and become enrolled by actors in ways which not only differ from the original intention of the controversy but also form networks of action with actors from complex and traditional networks.

Dent (2003) uses ANT to examine the strength of inscriptive devices which lock clinical identities in place, when faced with a threat of hospital closure. Dent (2003) proposed that using ANT as a conceptual lens would overcome the obstacles of established clinical responses (tightly held black boxes). He presented a case study of an apparent threat of hospital closure. He termed this as a "microcosm" (Dent, 2003: p. 109) of hospital change, arguing that its richness presented an appreciation for heterogeneous differences rather than generalisability. He typified the power

relations within this assemblage, between the managers and professional medical staff, as not being a hierarchy of enforcing subordination but rather that the assemblage dynamics led to actors becoming enrolled in the boundary (i.e. the OPP) of hospital closure, something they were all motivated to avoid. Dent uses Law's (1992) articulation of power (within an ANT lens) as "a (concealed or misrepresented) *effect*, rather than power as a set of causes," (Law, 1992: p. 387). This is similar to Latour's (1987) third and fourth rules of the method in which society and nature (the current representation of it) are the cause of controversies rather than their consequence (Latour, 1987: p. 258). He concluded that in this particular site, the governmentality of the medical profession had been reconFigured. The ANT lens highlighted the change in acceptance of the managerial function by the medical staff but that this acceptance was tempered with continually strong institutional values. Intermediaries continue to have a strong presence, namely the medical staff committee, which represent continued professional autonomy.

The enrolment of resistant clinical staff is documented in Papadopolous et al's (2011) translation of how management process change initiatives introduced lean thinking initiatives. The study found that there was no single one actor which was responsible for a shift towards a successful deployment of lean thinking. The translation of the pathology staff towards lean thinking showed that actor dynamics would form the necessary associations for the required identities and behaviours in the management process change. Not everyone was successful enrolled, which the authors document as the "trajectory" (Papadopolous et al, 2011: p. 183) of the translation.

> "The trajectory shows the difficult start (questionnaires and seminar not yielding expected engagement) of the initiative with the failure to engage biochemists in the problematisation created by the SIT. The SIT network and the biochemist network (of the individuals and their equipment) were distant from each other. The RIE afforded a space where positions could be adjusted, and the problematisation was moved down to the level of participating in the workshop and benefiting from the projected future Lean benefits. This resulted in a period of successful interessement and enrolment of the biochemists into the development of a future-state map and a process improvement

> plan (with OPPs furnished by the RIE). However, the change was not embedded in the organisation before key actors withdrew –, i.e. there was a failure to mobilise fully biochemists, the pro-change SIT network disintegrated and the retrograde network of biochemists started to emerge. The situation was redeemed by the arrival of the new CEO who formulated a different problematisation which enabled the re-engagement of the biochemists with the SIT network." (Papadopolous et al (2011: pp. 183-184). SIT = Service Improvement Team, RIE = Rapid Improvement Events.

The use of translation as a key mechanism to understanding the specifics of actor-dynamics is underpinned. The successful deployment of the lean thinking initiative is attributed with such translation, it being argued that it highlighted the ways in which "allies are engaged" (Papadopolous et al, 2011: p. 184) for example the function of the SIT in mediating and eventually enrolling multiple actors to the will of lean thinking. The authors attribute the actor-network lens with highlighting the devices which enabled "disparate" (Papdopolous et al, 2011: p. 185) groups to begin a conversation: successful problematisation which encompasses relevant concerns to the audience they wish to affect; the presentment of an opportunity for actors to present heterogeneous functions that serve a necessary part of the proposed paradigm (i.e. the OPP) and the autonomy to create objects (i.e. inscription devices) that bound their engagement in the lean thinking network. As a point of departure, these pro-active devices of identity construction provide useful clarity in identifying similar perceived moments in interviewee data in the HTA case study findings.

Another study of translation, McGrath (2002), documents a historical retracing of the journey from an apparently failed technology and the more successful enrolment of another. The paper tells the story of how over a four year period, an attempt to introduce a computer-aided dispatch system - LASCAD - in the London Ambulance Service (LAS) proved disastrous and was stopped in use after two weeks. In the time afterwards, an attempt to introduce another computer-aided system – CTAK – is described in an emerging space described as the Golden Circle – a method of association during the intervention which is "exclusive and inclusive, mysterious and rational, fabricated and real" (McGrath, 2002: p. 251). In the translation of actors, citing Callon (1986b), McGrath (2002) documents the points at which actors are

locked into place within the Golden Circle and how identities become fixed via enrolment by the focal actor, for example McGrath describes how the IT director fixed identities and associations within the Golden Circle approach.

> "We turn now to how the IT director locked LAS staff into the network of interests around the CTAK system. Here the Golden Circle approach was employed. This approach involved managing change by partitioning activities, so as to isolate areas directly involved in a change from other influences both within and outside the LAS (LAS, 1994b, c). The argument was that people outside the Circle were not affected by the change, hence should not interfere with it. The Circle was drawn around the 300 staff in the control room, who were defined as those with a legitimate interest in development of a call-taking system. People outside the Golden Circle, including LAS ambulance crews, were not aware of the implementation date for the new system (LAS, 1998a). This approach identified the actors to be involved in the development and sought to disassociate them from those who might challenge the legitimacy of the project...So control room staff were seduced into an alliance, the rules of engagement in which became apparent to them only over time. Nevertheless, these members of staff were aware that something was taking place in a shared space that was substantially different from the opposing regimes that characterized the LASCAD development," (McGrath, 2002: pp. 258-259). LAS = London Ambulance Service

The actors and their associations are fixed into place. Qualities attributed to the Golden Circle, similar to Callon's (1986) triangle of interessement, must be regarded in the time of the context, a point which Latour (1987) makes in regard to the nature of artefacts becoming facts. The qualities of the Golden Circle emerge as the project progresses. Informed primarily by Callon (1986b) and Latour (1999b), McGrath (2002) concludes that the actor-network lens elucidates the strategies used to create/maintain alliances, particularly highlighting persuasive rhetoric opportunistic actions as devices for political control.

3.8.1 - Section Summary

The enrolment of actors into a new paradigm is discussed in different ways. Studies concerned with the hybridisation of actor identities report varying stories of success, depending on the study/site – see Skaerbaek and Thorbjonsen (2007), McGrath

(2002) and Dent (2003). The length of time in observing the enrolling of hybrid identities is shown to be important – see Skaerbaek and Thorbjonsen, 2007. Translations occurring in complex healthcare sites are subject to boundary consideration and can result in unexpected transformations – see Cho et al, 2008. The governmentality (inscriptive hierarchy/traditionalism) of the clinical profession should be considered in framing and boundaries. Strong institutional values temper enrolment – see Dent (2003) but acknowledging existing power/relationships by allowing autonomy in actor identity construction may favour enrolment – see Papadopolous (2011).

3.9 – ANT and the Research Questions

In chapter one I introduced the key HTA tensions relating to healthcare decision making; methodological dissidence relating to calculative practice, finite public budgets, patient rights to healthcare and the issue of diversity in patient healthcare conditions. Chapter two validated these concerns with a review of the NICE specific HTA process, critiques of HTA practice from a clinical audience and of applicable findings from accounting and healthcare literature, specifically relating to DRGs. Concerns for accounting practices within healthcare decision making were summarised in Figure 5 and included representing values in healthcare, healthcare complexity and mobilising accounting practices within a clinical boundary. The importance of context-dependent analysis was emphasised. In this chapter I have presented the evolution of the conceptual framework used to answer the two research questions a) what network elements are revealed in speaking directly with HTA contributors and decision makers? and b) what do these network elements reveal about HTA calculative practice at NICE? ANT provides a framing methodology for examining context-rich network elements which are the focus of the first research question. By going back to the people in the land, I am re-opening the black box of HTA decision making. In taking the public account of the NICE HTA process (NICE, 2013, 2009a, 2009b) as the controlled-at-a-distance version of decision making, I am travelling backwards from this nth level of inscription, to let actors

speak for themselves. The first step in critically examining the HTA process is to determine what elements of networking have been diluted or omitted in the centralised translation process. This in effect is exploring the grey area between central calculative practices and subjective value judgements used in HTA decision making, a problematic tension which is predominant amongst HTA literature and similar accounting literature relating to DRGs. In finding out more detailed accounts from multiple actor perspectives via Callon's (198b) sociology of translation, qualities of calculative practices which are employed in the HTA decision making network are revealed, thus answering the second research question.

3.9 - Chapter Summary

In this chapter, the framework is outlined for answering two research questions: "what has been revealed by speaking directly with HTA contributors/decision makers?" and "what do these network elements reveal about HTA calculative practices at NICE?" The concerns for an accounting researcher investigating healthcare were expanded in line with contributions and points of departure from accounting/healthcare studies which used ANT frameworks. To begin with, the core ANT terms and principles including actor, network, inscription, black box, OPP and translation were overviewed. These terms were supported by ANT theorists, including Latour, (1987, 2005) and Callon (1986b). Callon (1986b) and Latour (1987, 2005) complement each other in terms of original ANT theory, language and definition. Callon (1986b) provides a structural road-map for observing in-action networks which Latour (1987, 2005) provides robust conceptual discussion for.

Accounting and healthcare issues from chapter one were thematically taken as points of departure for an analysis of how the accounting/healthcare literature which uses ANT could contribute to these areas. In section 3.6, I showed that Robson's (1992) "action-at-a-distance" is seminal to accounting studies using ANT, whose focus is inscription devices. Accounting boundaries should be pragmatic and taken with a broad view of calculative form. Accounting inscriptions should not stymie a

reflexive accounting interpretation, which can be translated directly by the researcher and not just through the actor's words (Lowe, 2001a). The complementing of Callon (1986b) and Latour (1987) as the basis for a theoretical framework is demonstrated in the accounting literature, see Skaerbaek and Melander (2004) and Carrington and Johed (2007).

In section 3.7, I showed that the length of observation time is important for observing in-action translations of accounting phenomena, particularly in complex settings. Latour's (2005) third move is demonstrated in the advocating of a reflexive form of accounting that utilises accounting boundary objects. Calculative practice is again rationalised to necessitate a broad interpretation and should not privilege positivist forms (McNamara et al, 2004). Unexpected transformations can be witnessed in complex networks (Lodh and Gaffikin, 2003). The empirically complex site should be considered in terms of potential strength of associations that already exist with the accounting profession. In particular reference to healthcare literature, the black box of science and of established responses are argued to potentially stymie innovation and development, see Moser and Law (2006), Preda (2004) and Degeling and Rock (2010).

Section 3.8 demonstrated that the particulars of a given site meant that the successful enrolment of accounting practices was a fragile and often temporary success. Studies concerned with the hybridisation of actor identities report varying stories of success, depending on the study/site for example see Skaerbaek and Thorbjonsen (2007), McGrath (2002) and Dent (2003). The contextual timing (for example relative to wider political circumstances affecting the network) of enrolling hybrid identities is shown to be important (Skaerbaek and Thorbjonsen, 2007). Translations occurring in complex healthcare sites are subject to boundary consideration and can result in unexpected transformations (Cho et al, 2008). The governmentality (inscriptive hierarchy/traditionalism) of the clinical profession should be considered in framing and boundaries – strong institutional values temper enrolment (Dent, 2003) but acknowledging existing power/relationships by allowing autonomy in actor identity construction may favour enrolment (Papadopolous, 2011).

CHAPTER FOUR
METHODOLOGY AND METHODS CHAPTER

4.1 - Introduction

This chapter is presented in two parts: methodology and methods. To establish the methodology of this researcher, the first part of the chapter deals with ontological and epistemological assumptions. Reality is seen as a social construction, through the collusion of human consciousness, forming shared realities. Knowledge claims are dependent upon the stability of shared realities. There is nothing outside of knowledge that has not been initially established and labelled in the reality of human consciousness. These methodological assumptions are found to be mirrored in definitions of interpretive accounting research (Ryan et al, 2002).

Accounting frameworks are methodologically assumed to represent interests that are located both locally and in wider respects. The form of accounting will find a boundary of definition in the relations within which is operates, for example by organisation or institution. These relations are seen as the "social context" (Robson, 1992: pp 700). Reflexivity of accounting form is assumed. The social context of this thesis is confirmed as accounting and healthcare. Healthcare "players" (Chapman et al, 2014: pp. 361) include a wide range of stakeholder groups. Different boundaries of accounting values are represented in cases like Diagnosis Related Group (hereafter DRG) differentiation.

The journey to Actor Network Theory (hereafter ANT) - see Latour (1987, 2005) and Callon (1986b) - is described in relation to framing issues and reflexivity of accounting form. ANT clarifies this theses methodology, both philosophically and in the structure of the method. Critiques and limitations of ANT are outlined. Accounting's use of ANT provides guidance on the appropriateness of research methods and in answering the question 'what is information?'

The second part of the chapter concerns the methods by which primary data was gathered for the Health Technology Assessment (HTA) case study at the National Institute for Health and Care Excellence (hereafter NICE). The case study method is discussed and critically defended in relation to the particular social context explored in this thesis. A description of the major events in data gathering follows, along with tabled version of data events. The process by which data was analysed is discussed in relation to answering the first and second research questions a) what network elements are revealed in speaking directly with HTA contributors and decision makers? and b) what do these network elements reveal about HTA calculative practices at NICE?

4.2 – Methodology

This section will outline the methodological assumptions supporting this thesis.

4.2.1 - Methodology: Ontological Assumptions

Chapters One and Two outlined the literature used in forming the theoretical framework employed in this thesis. This section situates the philosophical assumptions which support this framework. At the most basic level, 'objectivity' and 'fact' are found to be the result of a majority consensus regarding knowledge, as opposed to an existence outside of knowledge. This thesis identifies with Morgan and Smircich's (1980) subjective-objective assumptions for reality as a social construction.

> "Individuals may work together to create a shared reality, but that reality is still a subjective construction capable of disappearing the moment its members cease to sustain it as such. Reality appears as real to individuals because of human acts of conscious or unwitting collusion," (Morgan and Smircich, 1980: pp. 494).

The individual who willingly colludes is assumed to have *intention*; a particular motivation for confirming a world view. This thesis makes the assumption that willingness to collude in subjective construction implies heterogeneous value

systems and a desire for enquiry. Bickel (1975) depended upon Socrates for his clarification of the value of enquiry – of any enquiry: "the unexamined life, said Socrates, is not worth living. Nor is it bearable. To acknowledge no values at all is to deny a difference between ourselves and other particles that tumble in space," (Bickel, 1975: pp. 5). The very existence of debate, of difference, of people that identify as positivist and interpretivist adds value to living. The contestation of theory, irrespective of the majority consensus, advances the production of knowledge. The existence of debate and argument is an acknowledgement of values, without which conscious life cannot have defined interests.

Ryan et al (2002) have adapted Morgan and Smircich's (1980) seminal paper for the purpose of outlining six different ontological assumptions. This thesis identifies with the positioning of reality as social construction, with continuous, adaptive sense making. Ryan et al (2002) cite Hopper and Powell's (1995) taxonomy of research to describe three categories of accounting research; critical accounting research, mainstream research and interpretive research. This thesis identifies with the ontological and epistemological assumptions attributed with interpretive accounting research, as it is seeking to explain observed calculative practices (i.e. what is in the black box) at NICE. Ryan et al (2002) link the work of Latour with interpretive research.

4.2.2 – Methodology: Epistemological Assumptions

The epistemological assumptions of this thesis, then, centre on the idea that what is considered to be real, is the result of sustained shared realities. The majority consensus regarding truth and objectivity is continually framed in an ongoing ontological enquiry. Shearer (1996) conceptualises this by reasoning that the question of reality can only be answered through language. As we have created language, the labelling of something as being independent of ourselves has only arisen out of our agreement on the definition of the words ourselves and independent.

Russell's (1912) metaphor on the existence of the table[7] contains the interpretivist assumptions regarding epistemology that support this thesis;

> "Other philosophers since Berkeley have also held that, although the table does not depend for its existence upon being seen by me, it does depend upon being seen (or otherwise apprehended in sensation) by some mind – not necessarily the mind of God, but more often the whole collective mind of the universe. This they hold, as Berkeley does, chiefly because they think there can be nothing real-or at any rate nothing known to be real except minds and their thoughts and feelings." (Russell 1912/1998: Chp 1)

The table depends on the relations of human consciousness and interaction for its existence. The label of 'table' denotes a particular arrangement of flat surfaces and perpendicular angles which has not appeared out of some other reality, preformed and absolute. Ryan et al's (2002) adaption of Chua's (1986) epistemological assumptions for interpretive accounting research states that knowledge's, "adequacy is assessed via logical consistency, subjective interpretation, and agreement with the actors' common-sense interpretations" (Ryan et al, 2002: p. 42). Russell's (1912) "whole collective mind" and Morgan and Smircich's (1980) "shared reality", however, exist in duality with *intention*. The individual or other entity, in totality, both constitutes and sustains knowledge, *intentionally*.

Whatever relations have led an entity's collusion regarding reality, they have been based on that entity's individual intention. These relations between shared realities are assumed to vary in strength. What turns assumption into theory, and then into knowledge? By what lens are these relations (which are necessary for reaching definition) defined in themselves? The next section outlines the relations that this thesis identifies with, namely accounting. Subsequent discussion centres on why and how the thesis uses ANT, primarily to address the issue of interdefinition and the perceived reflection of interpretivist assumptions in core ANT literature.

[7] I cannot withhold the motivation for choosing this metaphor. Close friends still celebrate difference by refusing to agree on the existence of the table.

4.2.3 – Methodology: On Accounting Relations and Calculability

This section situates the set of relations that this thesis attaches itself to, specifically accounting. There are two main points to make in this section. The first is that this thesis identifies with the idea that accounting exists within shared realities that agree on the need for a defined version of accountability. In a free society of conscious entities, where society advances due to intentional debate/theory, the debaters must convince others to achieve their majority consensus. The forum of debating theories must include an explained rationale, in order to convince others. In a society where the majority consensus takes the form of institutions, the explained rationale must have an ability to account for itself that is far reaching. The form of accounting taken by the institution is informed by the intention of the debater; its definition of accountability is inherent within the methods used to explain its rationale. This leads to the second main point. The definition of accountability, based on interpretivist assumptions, is found to be reflexively perceived in accounting studies. The answers to the question of what is information, is thus found to exist in the relations between different definitions of accountability and the particularities of the study in question.

Robson (1992) acknowledged that the dominant mode (shared reality) of what is classed as information, in early accounting theory, was that of quantification, leading to an assumed infallibility of calculation. Robson (1992) uses the term "social context" for the particularities that were described above. The form of accounting that Robson discusses (a form of writing, through numerical inscriptions) is stated to be merely one possible mechanism. The paper points out the dissidence between critiques of accounting as operating through rhetoric. The three qualities of Robson's numerical inscription are that of combinability, stability and mobility, offering a solution to the problem of "action from a distance" (Robson, 1992: pp. 689). The different audiences in Robson's (1992) argument exist in multiple shared realities. The dominant mode of quantification is not universal. The question of what is an acceptably measureable accountability form is shown to face the problem of localised particularities. Numerical inscriptions are not the only form of information.

It is assumed that calculability faces the presumption of needing a mutually agreed definition. It is also assumed that calculability is an applied extension of this definition on other entities. Chapter One and Two highlighted the reflexivity of form in different accounting studies. Carrington and Johed (2007) explored the different forms of accounting technology used in examining how top management was constructed as a good steward during AGM's in Swedish companies. Mouritsen (1999) found that there were two forms of control in the flexible firm (paper and hands on). The issue of accounting relations and calculability is treated in this thesis, with these interpretivist assumptions. Calculability extends and legitimises an intended shared reality but is dependent upon agreed entity definition. The question of what is information (this extends to what is considered to be evidence) is not bound by some objective standard that was created outside of knowledge.

The particularities or social context of this thesis is that of social accounting in healthcare. This examination of similar relations has yielded interpreted boundaries and definitions. These have methodologically informed the choices made in gathering data i.e. in answering the question of what is information. Chapter one identified the concerns for accounting researchers in healthcare – these concerns reflect the boundaries and definitions (the problematisation) of the case study details in this thesis. The first part of chapter four centres on a contextually detailed case study overview of these boundaries and definitions. The basis for deciding what is information drives the sources of evidence utilised in the NICE case study. The social context, from accounting literature, provides broadly categorised players in accounting and healthcare studies.

The rest of this methodological section will first summarise the healthcare players and their interactions with accounting frameworks. Important issues include the challenges faced in enrolling clinically motivated players with new and existing calculative practices. An interpretivist view of the multiplicity of accounting languages is established. This will frame the problem of pragmatic research intention versus the battle of complex shared realities concerning calculative practices. The methodological journey to ANT is introduced. The philosophy of ANT is seen as a

way to bridge the issue of pragmatic research intention and the framing problem of micro complexity and action-at-a-distance accounting calculability (and thus control). The use of ANT by accounting and healthcare theorists is briefly overviewed in respect of the methodological advancements made in answering the question what is evidence.

4.2.4 - Methodology: On Accounting and Healthcare

Chapter One outlined the review of literature from accounting theorists whose social context involved a healthcare setting. Issues facing the implementation or sustainability of accounting systems within a healthcare setting were identified. There is a fight for dominance in the multiple shared realities concerning calculability and what is information within the healthcare setting. Newhouse (1989) and Mogyorosy and Smith (2005) challenge the definitions between economic and accounting costing methodologies and show how they lead to differences in measuring/valuing resource consumption.

Cordery et al (2010) found that a profit-oriented model of measurement resulted in a lens on GP's rather than communities. They identified a wider range of stakeholders within the healthcare setting to include funders, healthcare providers, patients and communities. Samuel et al (2005) identified healthcare stakeholders that were material to the relations of DRGs. These stakeholders included patients, doctors, insurers and state agencies These stakeholders were involved in the relations sustaining what Samuel et al (2005) described as a "physico-fiscal body" (Samuel et al, 2005: pp. 252). This physico-fiscal body is an example of a shared reality, one which sustains the idea that the presence of economic rationale to the clinical domain is irrefutable.

Cardinaels and Soderstrom (2013) identified a wide range of healthcare players: internal actors which included physicians, nurses, CFO, CEO, medical director, management, board of directors, supervisors; governmental bodies which included

federal/provincial bodies and local government, legal systems; healthcare market actors which included health insurers, patient groups, hospital competitors and the local community. They also identified perceived stakeholder goals when they advised that future studies should include patient groups, to situate concerns in balancing cost reduction and quality of care. Cost reduction and quality of care are taken as two of the main stakeholder goals in any control system within a healthcare setting.

A key finding of the accounting and healthcare literature included the idea that when the introduction of a new control system (a new shared reality in the battle for dominance) was not automatically seen as an obstacle, the enrolment of clinical stakeholders to that shared reality was significantly smoother for example see Kurunmaki (2004) and Scarparo (2006). The selection of evidence in the NICE case study is therefore guided by an open-minded assumption that not all clinical stakeholders are averse to sharing the reality of new control systems in their healthcare settings.

The accounting and healthcare theorists showed that concerned groups should be considered reflexively within the complexities of the healthcare setting. Who or what is material to the relations between the accounting system and the healthcare setting, should not be limited by the employment of highly reductive stakeholder boundaries. Different boundaries/definitions concerning calculability should be considered by the accounting theorist, who should avoid making assumptions about the goals and methods of the clinical stakeholders. The action-at-a-distance of generalisable control systems, within healthcare settings, faces the problem of the micro complexity of its relations.

4.2.5 – Methodology: On the Multiplicity of Accounting Language

The concept of researcher intention attaches boundary, meaning and definition as the entity moves through relations. This thesis, being any such entity, philosophically

identifies with the multiplicity of symbolism to be found in accounting. Rorke (1982) describes the ancient Welsh system of valuing the worth of a stolen cat (from granaries – their job to hunt vermin that might decimate such stock) so as to accordingly fine the convicted thief. There were different valuation concerns that needed to be accounted for within the standardised measure, not the least of which was the scaling system for un-uniform felines and varying qualities of wheat:

> "At issue is the stickiness of the wheat. If the wheat is frictionless then an infinite quantity of wheat could be poured over the long suffering feline with no resolution of its value. A wheat farmer friend of mine has assured me that in fact wheat will form a cone but that the size of the cone may well depend upon the grade of wheat used and whether it has been properly dried," (Rorke, 1982: p. 306).

The multiplicities of value concerns that are inherent in this example of accounting system are assumed to be necessary considerations for framework development in a given set of relations.

The thesis identifies with the difficulty in finding contextually independent terminology to describe sets of relations and thus the multiple shared realities of entities, which are assumed to battle for dominance. The attachment of a particular set of relations comes with particular ways to move i.e. measurement principles, lenses, and rationales. There is also a difficulty for the entity in explaining the *why* of an attachment to a particular set of relations, in this instance a philosophical set of beliefs. By what means does this researcher hold core interpretivist values? Attachment can be confirmed. The problematisation of a theoretical framework that is underpinned by such attachments can be explained. The point, then, is that this thesis sees a difference between supporting the application of a philosophically supported theoretical framework upon an empirical exercise, and supporting attachment to intrinsically held assumptions by some explanation that exists outside of the relations which formed them. If taken as an entity (one which has circulated in accounting relations), this interpretivist thesis identifies with the reflexivity of form in accounting. There is an assumed multiplicity of values attached to this reflexivity

of accounting form. Further core references in this positioning include Robson (1991, 1992) and Shearer and Arrington (1993).

4.2.6 - On Methodology and Actor Network Theory

This section will bring focus on the methodological journey which led to ANT being a part of the interpretivist philosophy of this thesis. The earlier sections discussed the idea of shared realities and pragmatic researcher intention. The assumption of a multiplicity of values in accounting measures is problematised in the relations of particularities and social contexts. The social context of this thesis was clarified. The diversity of healthcare players, their definition/boundaries and the healthcare relations through which accounting systems are established, were made clear. There is a problem of how to describe accounting relations via size: the micro local complexities versus calculability from a distance. In other words, this is a framing and boundary issue.

In considering this fundamental framing issue, early in the development of this thesis, the works of Bruno Latour and Michel Callon were introduced. The principles of ANT philosophically and methodologically problematise the framing/boundary issue within the interpretivist assumptions of shared realities, pragmatic research intention and multiplicity of accounting value/form.

The key ANT literature used in the theoretical framework of this thesis includes Latour (1987, 2005) and Callon (1986b). Latour's (2005) discussion on matters of concern and matters of fact, methodologically informs the philosophical assumptions of pragmatic researcher intention discussed previously. Latour (2005) advances a change in the social sciences surround the nature and science debates. He advocates the retracing of gatherings rather than apparently solid facts, in the mapping of less stable controversies.

> "The important ethical, scientific and political point here is that when we shift from the world of matters of fact to the *worlds* of matters of concern, we can no longer be satisfied either by the *indifference* to reality that goes with multiple 'symbolic' representations of the 'same' nature or with the *premature unification* provided by 'nature'. By including the many results of the sciences into the zoos of agencies at work together in the world, we have crossed another Rubicon, the one leading from *metaphysics* to *ontology*." (Latour, 2005: pp. 116-117) (Italicised in original).

Latour's (2005) words are advanced upon in the interpretation of his ideas of indifference. The point is that ANT principles reflect a core philosophical assumption of this thesis; irrespective of right or wrong answers, if there ceases to be an *intention* to advance, to change, then there is no awareness of a premature unification having occurred. Latour's (2005) use of the word concern is interpreted as similar to what has been argued as meant by the word intention. Latour (2005) highlights the complexity that goes along with acknowledging multiple worlds.

> "But I confess the difficulty: Is it not counterproductive in the end to abandon the convenient shorthand of social explanations, to split hairs indefinitely about what is or is not a group, to trick intermediaries into behaving as mediators, to register the queerest idiosyncrasies of the humblest actors, to set up long lists of objects participating in action, and to drop the background of solid matters of fact for the foreground of shifty matters of concern?' (Latour, 2005: p. 121).

Latour's (2005) thoughts on the worthiness of endlessly tracing the smallest idiosyncrasies are interpreted as reflecting a similar theme of the need for a pragmatic researcher intention. This has been exercised in this thesis in two main ways; through the wedding of Latour's (1987, 2005) ideas regarding networks with the structure and principles of Callon's (1986b) sociology of translation and with the formation of relations with the accounting and healthcare literature regarding boundaries and definition.

In the first of these two ways, Callon's (1986b) sociology of translation, combined with key concepts from Latour (1987, 2005) (including networks, actors, inscriptions, black box, OPP and translation), has qualified the philosophical assumptions of this thesis in new terms. It has also advanced the methodological structuring of the theoretical framework. Callon's (1986b) three principles of agnosticism, generalised symmetry and free association are appreciated in terms of matching the philosophical assumptions of this thesis. The multiplicity of accounting language renders many potential inscriptive forms of calculation (Robson, 1992), so for the researcher investigating accounting (i.e. the controversy) within healthcare, they should employ agnosticism as all actors engaged in the controversy each have their own definitions and boundaries. Latour (1999) reflects on the efforts of ANT to provide researchers with a way of learning about actors without imposing sense-making relations on actors that come from the observers themselves:

> "The ridiculous poverty of ANT vocabulary – association, translation, alliance, obligatory passage point etc, - was a clear signal that none of these words could replace the rich vocabulary of the actor's practice, but was simply a way to systematically avoid replacing their sociology, their metaphysics and their ontology with those of the social scientists who were connecting with them through some research protocol..." (Latour, 1999: pp. 20)

This also extends to the idea of human and non-human actors (agnosticism). The researcher who seeks to investigate the controversy should reflect this impartiality between actors, particularly with the lay understanding of healthcare of this thesis, by explaining differing perspectives in equal terms (generalised symmetry). The impartiality between groups of actors extends to discarding a priori assumptions made about actor definition and boundary. In approaching the NICE case study, this thesis does not presuppose the importance of any one group (free association). In some respects, this is slightly easier given the lay understanding of the clinical context and politics of HTA process. Chapter five includes a more detailed employment of these principles in the selection of evidence, particularly in the abandoning of preconceived ideas regarding the materiality of particular actor groups (for example see section 5.1.1 for discussion on commissioning groups and the inter-

definition of actor identities). It should also be noted here that this thesis identifies with core ANT ideas regarding the power and materiality of non-human actors, but the focus of the research questions is on the un-translated perceptions of the HTA process from the human contributors and decision makers that are controlled, reduced or even missing from the controlled-at-a-distance HTA process guides[8].

Callon's (1986b) model has also methodologically structured the theoretical framework. The above explanation shows the matching of the philosophical assumptions with Latour's and Callon's ideas. The four stages of Callon's (1986b) model provide a platform for pragmatically problematising these assumptions for an "in action" (Latour, 1987) piece of research. Like Latour's (2005) points regarding the splitting of hairs when it comes to the shifty world of matters of concern, the endlessly circulating relations between the worlds must be framed with purpose and researcher intention. Callon (1986b) discusses these moments (problematisation, interessement, enrolment, and mobilisation) as an imperfect solution to the otherwise chaos of endlessly shifting intermediaries. Translation, he argues, is a process before it is a result. The moments of translation, are more easily captured on paper than in life. The process of translation is inevitably ongoing, but, the main point is that the equilibrium has changed (Callon, 1986b). The controversy of science and nature both *circulates* and *is*. So, to confirm, ANT, has been used because it mirrors the interpretivist assumptions of this thesis and because it offers a structuring device for problematising these assumptions in the social context of accounting's particular concerns of size and scale, calculability and form.

The second of the two main ways in which ANT has methodologically advanced this thesis concerns the use of ANT by accounting and healthcare theorists. The diversity of studies which have used ANT has advanced upon the question of what is accepted as information or evidence. Several studies advocate the timeliness of the ANT study

[8] I do not mean to say that there are no non-human actors in HTA. The presence of economic rationale to the HTA clinical dimension is an important non-human actor. Its influence is keenly felt in decision making. The public budget both supplies NICE with financial power and must be accounted to by decision makers. The calculative practices are governed by the apparent irrefutability of an economic rationale and serve as inscriptive devices of this non-human actor.

in accounting, many supporting the need for a longitudinal approach to observe in-action issues relating to accounting for example see Lodh and Gaffikin (2003), Skaerbaek and Melander (2004), Christensen and Skaerbaek (2007, 2010), Gendron and Barrett (2004) and Jeppensen (2009). The accounting literature has also shown that many theorists have termed their ANT research as a case study.

The choice of ANT theorist to follow is an interesting issue to consider. There is no ANT literature which calls itself fundamental or core. ANT is taken as an umbrella term for the different disciplinary uses. Chapter Two showed the ANT studies conducted in accounting by varying branches; translation studies; inscription, calculation and network studies. The choice of core literature can vary. Advancements made by different researchers are somewhat tied to disciplinary relations and boundaries for example see Law's (1999) reflection of how ANT has been translated by different disciplines, or "other points of origin," (Law, 1999: pp. 10). It is not enough to define a boundary by academic discipline either for example Chapter Two discussed accounting's use of ANT and the varying critical evaluations that different theorists make in choosing an ANT theorist to follow.

4.2.7 – Critiques and Limitations of Actor Network Theory

In this section, criticisms and limitations of ANT are addressed. Key themes include critiques from the scholars who initially developed ANT and their frustration at the some of the ways in which it has developed. Other critiques include views that ANT does not adequately capture analysis of power and domination structures within society, of ANT's agency to non-human actors and whether ANT can be considered a theory of the social at all.

Law (1999) addresses criticisms of ANT which challenge its label as a theory. He responds that dissenters should consider that the development of ANT has incorporated many practices and points of origin: "Its parts are different from one another. But they are also (here is the point) *partially connected*. And this, of course, is another way of talking of the problem of naming, the problem of trying to discern

or impose the ‘ANT’-ness of ANT. Or, indeed, any of the single-line versions of actor-network theory, the ‘have theory, will travels’ which have proliferated,” (Law, 1999: p. 10). The apparent versions of actor-network theory, which are partially connected in what he also described as a multi-national monster, have subsumed disciplinary specific associations from the points of origin which were interested in ANT.

A recurring criticism of ANT relates to its treatment of power and dominance structures within society. Bloor (1999) is vehemently critical of Latour’s body of work. He finds that theories purported by Latour are actually general sociology of science arguments, made to look different with the addition of newer terminology. Referring to arguments of agency and power within society, Bloor (1999) disagrees with Latour’s idea that agency and power are solely found in social processes. He disagrees with that Latour’s (1990) assertion that no one has robustly deconstructed his (Latour’s) vocabulary of “power, society, group, calculation of interests and sovereignty” (Latour, 1990: p. 159).

Latour (2005) discusses power and dominance, while prefacing his arguments regarding the agency of objects. As a social theory, Latour (2005) understands that ANT faces critique in regards to a neutral attitude towards understanding such societal structures. It is however, at the core of purpose of tracing associations, the desire to understand and explain structures of power and dominance.

> “’What have you done’, people could ask in exasperation, ‘with power and domination?’ But it is just because we wish to *explain* those asymmetries that we don’t want to simply *repeat* them – and even less to *transport* them further unmodified. Once again, we don’t want to confuse the cause and the effect, the *explanandum* and the *explanans*. This is why it’s so important to maintain that power, like society, is the final result of a process and not a reservoir, a stock, or a capital that will automatically provide an explanation. Power and domination have to be produced, made up, composed. Asymmetries exist, yes, but where do they come from and what are they made out of?” (Latour, 2005: pp. 63-64.).

Power and domination structures are the settlement of controversies and we cannot use them to explain society. Rather, we must trace the associations leading up to the stable settlement of the controversy (black box) from earlier dissenters efforts. Examining the minutiae of asymmetry associations is motivated by a desire to understand the power and domination structures within a given network boundary. There is nothing neutral about ANT in that sense.

McLean and Hassard (2004) critique the production of ANT accounts within management and organisation theory. This critique largely centres on the ability of ANT accounts to be robust and symmetrically balanced in terms of five critical issues; the inclusion/exclusion of actors, the treatment of humans and non-humans, privileging and status, agency and structure, politics and power (McLean and Hassard, 2004).

The inclusion/exclusion issue relates on the selection of material actors within an ANT account. McLean and Hassard (2004) review different authors ANT critiques and find that in respect of this issue, a problem lies in determining at what stage it is sensible to stop following the actors. They reference Miller (1996) and accountants, in the context of the inclusion problem, as a group that would particularly find when to stop following the actors, a problematic issue. The human/non-human issue is seen as controversial by those who do not agree with ANT. McLean and Hassard (2004) cite Collins and Yearley (1992) and their assertion that the apparent symmetry applied in an equal tracing of human and non-human objects, in fact renders the ANT account as politically impotent. Although the human observer acknowledges the actor status of non-humans, ANT accounts are still seen as human-centred, with an end result being that spokespersons can symmetrically account for both human and non-humans, but spokespersons must be human.

The privileging and status issue is interconnected with critiques of the status granted to non-humans by ANT. Again citing Collins and Yearly (1992), the limitations of ANT to separate meaningful human actions and the conduct of non-human objects are underpinned by a critique of giving non-humans a material actor status over

humans. Collins and Yearley (1992) find that non-human material actors are given much more meaning than would be granted by humans (McLean and Hassard), 2004). The agency/structure issue relates to claims that ANT is good at dealing with local minutiae and processes, but that it does not succeed at considering the relevance of larger social structures which have effects on the local. Latour is stated as not having the desire to broach the agency/structure debate, but acknowledges that it is problematic within ANT. The political issue relates to the recurring criticism of ANT being apolitical. McLean and Hassard (2004) note that Latour (1991) responds to this critique by stating that the settlement of a controversy "by its consequences does not mean that we are indifferent to the possibility of judgement, but only that we refuse to accept judgements which transcend the situation," (Latour, 1991: p. 130). A similar defence against the charge of apoliticism is made by the authors, drawn from Foucault (1977) who makes the point that domination is not a cause but an effect.

Whittle and Spicer (2008) also critically examine the contributions of ANT to organisation theory. While stating that ANT can make valuable contributions to the study of organisations, they challenge ANT's ability to provide a critical account of an organisation. Confronting the methodological underpinnings of ANT, Whittle and Spicer (2008) find that ANT does not challenge power and domination structures within organisations and is therefore not critical. This challenge against the methodological claims of ANT is deconstructed in the following ways. Claims towards ontological relativity are seen more as ontological realism. Claims towards epistemological reflexivity are seen more as epistemological positivism. Claims towards political radicalism are seen more as political conservatism (Whittle and Spicer, 2008).

In Whittle and Spicer's (2008) critique, ontological limitations of ANT centre on its essentialist treatment of the non-human world. In the context of organisation theory, ANT is unable to answer critical questions and is then susceptible to universally abstract definitions, with little deeper understanding of contextual associations. Political limitations of ANT are centred on the contraction of meaningful interaction

between actors, by raising the status of non-human actors in ANT analysis. Deeper analysis from meaningful interaction is not done and the understanding of contextual politics is surface level. Epistemological limitations of ANT are linked to claims that ANT is ethnocentric (as cited from Bloomfield and Vurdubakis, 1999). In Whittle and Spicer's (2008) critique, in the employment of agnostic observations, some of the contextual meanings in a group are dismissed in favour of an ethnocentrically superior view. This view is not necessarily superior, and dismissing contextual meaning could result in different accounts being produced between the observers and the actors themselves. Referring to seminal ANT studies, Whittle and Spicer (2008) demonstrate this epistemological critique: "few fishermen would be likely to attribute agency to scallops (cf. Callon, 1986a), few scientists would agree that their knowledge claims are relative (cf. Latour, 1987)," (Whittle and Spicer, 2008: p. 617).

4.3.1 - Methods: The Case Study Method

The majority of accounting studies which have used ANT, term their primary research as a case study. Callon (1986b) describes the seminal study of fishermen, researchers and scallops in St Brieuc Bay as a case study. Saunders et al (2012) define a case study as a "Research strategy that involves the empirical investigation of a particular contemporary phenomenon within its real life context,' (Saunders et al, 2012: pp. 666). They also support Yin (2009) in defending the use of the case study: "Yin (2009) also highlights the importance of context, adding that, within a case study, the boundaries between the phenomenon being studied and the context within which it is being studied are not always apparent." (pp. 179).

The importance of context has already been established in the first part of this chapter. This thesis identifies with accounting and healthcare studies that examine accounting phenomena within the social context. The shift from matters of fact to matters of concern means that there is a potential for chaos in endlessly debating on the significance of mediators. The researcher intention to examine a particular boundary can be interpreted to mean that they have a focus within these potentially

endless relations. However, this focus is tied to a context. The advantage of the case study then, is that it already matches the particular focus that the researcher intends. An individual who identified with another research paradigm, say, a strongly positivist approach, would depend upon the generalisability of phenomena. They would be unlikely to use a case study method.

Ryan et al (2002) has identified several different types of case study research in accounting. These include: descriptive case studies in which the use of accounting systems, techniques and procedures is discussed; illustrative case studies where innovative and new practices are postulated; experimental case studies where recommendations for new accounting procedures are made from existing theoretical frameworks; exploratory case studies where the reasons for particular accounting practices are explored and explanatory case studies which attempt to explain the reason for observed accounting practices (pp. 143-144). This thesis identifies with both the label exploratory and explanatory case study. The exploratory element of this case study is in investigating the network elements revealed in speaking directly with contributors and decision makers of the HTA process as opposed to the controlled-from-a-distance appraisal guides. These are new elements of information. The explanatory element of this case study is investigating the relationship between these new elements of information and observed accounting practices.

Some of the critiques of the case study method include the difficulties in depicting limitations on the topic material of the case and the interaction of the researcher in setting these boundaries i.e. objectivity issues (Ryan et al, 2002). The principles of ANT, particularly Callon's (1986b) sociology of translation, already account for this issue. This criticism, however, is qualified by the interpretivist assumptions that support this thesis for example see Burr (2002) who states that "no human being can step outside of their humanity and view the world from no position at all," (Burr, 2002: pp. 152).

4.3.2 – Methods: Research Methods used in a Case Study

The methods employed in a case study can be wide ranging. They can be mixed in terms of qualitative and quantitative. A range of methods can be used in the one branch of qualitative or quantitative. Saunders et al (2012) acknowledge that interpretivist frameworks most often use qualitative, in depth investigations. In line with the review of the accounting studies which use ANT, the question of what is evidence, should not consider the conventions of empiricism to be an obstacle.

The choice of methods employed in the NICE case study evolved as the in-action timeline extended. Briefly, the methods used to gather data included observation, semi-structured interviews and observation. As understanding of the HTA network evolved, the research questions also advanced. The focus of this study became the human actors of the HTA process and how their enrolment of the system aligned with the view given in the appraisal guides. The complex relations revealed in the focus of multiple healthcare players revealed the volume of nuances that the inscriptive controlled-from-a-distance guides were truly representing. This focus meant that the best way to explore this in an in depth way, was to use interviews as the main source of evidence. Regarding the format of the interview method, semi-structured was chosen. The reason for this is to balance Callon's (1986b) three principles against the interpretations of contextual relations yielded from a review of accounting and healthcare literature. There were pre-conceived themes of questioning but free reign was given amongst these themes to interviewees i.e. allowing actors to speak for themselves. The next section outlines the main events that occurred during the primary data gathering.

4.3.3 – Methods: Collecting Data

The Wishart (2009) case study established an initial order of tracing the HTA network. Literature reviews were conducted to gain a better understanding of the clinical context. This literature included learning about the pharmaceutical supply chain, reading about the HTA process on an international level and becoming

familiar with the structure and content of NICE documents (appraisal guides, the Final Appraisal Determination (FAD), the Appraisal Consultation Document (ACD) and others). Through this reading, the HTA process was initially engaged with through observations of HTA appraisal meetings as a registered public attendee. The public attendee can observe the open part of the appraisal meetings, where data relevant to the decision is discussed. Public attendees received copies of the slides used for the cost and clinical efficiency presentations and a copy of the meeting agenda. During initial attendances, important networking occurred with contributors/decision makers who agreed to take part in research interviews. Subsequent recruitment of interviewee subjects came from personal recommendations of people that had already been interviewed or from obtaining details from NICE appraisal official minutes, and using the internet to find their contact information.

The choice of who to interview is explained in more detail at the beginning of chapter four but briefly, these included those who had been involved as patient experts, clinical specialists, manufacturers of the health technology, members of the Evidence Review Group (ERG) and decision makers (inclusive of committee members, committee chairs and vice chairs). Ethical approval for the intended interview process was granted by the Accounting department within the University of Strathclyde. NHS ethical approval processes were initiated but ultimately decided to be unnecessary as all information discussed in interviews pertained to publicly available information and there was no involvement with vulnerable groups.

The philosophy of following the actors in the data gathering phase resulted in the employment of other research methods/events, although these were minor compared to the substance of the interviews and observed appraisal meetings. Participant-observation occurred from following the actors involved in a particularly rare diagnostic area. The participant-observation took the forms of attendance and interaction at a patient conference. A follow up overview article was solicited by the charity, for their hardcopy charity magazine.

To answer research question one, I have taken the main documents which publicly describe the HTA process at NICE as inscription devices. The black box of HTA at NICE, I argue, is perpetuated through these documents as a form of control at a distance. Latour (1987) described the problem of retaining the necessary elements of a controversy to interest others. The definitions and process overviews from NICE (2009a, 2009b, 2013) and other supporting information are taken as the representation of as many elements as possible by NICE, to interest those who it deems necessary to the controversy of HTA.

The complex nature of HTA and the local associations that it has within different disease areas, is reflected in the definitions of NICE (2013) calculative practices such as the reference case. Heterogeneous decision maker's autonomy and judgement and methodological dissension regarding what is evidence, are all given as complex network elements which NICE (2013) acknowledges. NICE (2013) describes the roles of contributors and decision makers in the HTA process. The inscription devices represent both the actor definition of those deemed necessary to the controversy and the network elements that these actor duties fulfil with their contribution. Research question one seeks to find out what network elements are revealed in going back to the "people in the land" (Latour, 1987: p. 234), instead of being simply taken as black boxed representations in the "final nth" level of inscription (Latour, 1987: p. 234).

This also guides the observer towards the actor groups to interview in order to answer research question one. Chapter one revealed the different healthcare players which are involved within clinical boundaries. The definitions of required actors found in NICE (2013) is being taken back from the nth level of inscription. As a guide, the inscription device let me know what to expect as a public observer at HTA appraisal meetings. The observations I made further guided me to exploring the materiality of actor groups in the HTA network. Pilot interviews confirmed, in their own words, the choice of five actor groups that contribute material evidence to HTA. These were patient experts, clinical specialists, the Evidence Review Group (ERG), the manufacturer and the appraisal committee decision makers. I did not interview

other actor groups that were present during appraisal meetings when my observations were confirmed by actors in their own words.

Figure 9 - – Showing interview details

Table Highlighting Interview Details from Jan - June 2011				
Date	**Interview No**	**Code in text**	**Actor Role**	**Area of Medical Relevance**
17.1.11	1		Committee Member (also part of an ERG)	Decison maker, deals with many areas
17.1.11	2	AM	Manufacturer*	Represents many diagnostic areas
17.1.11	3	BM	Manufacturer*	Represents many diagnostic areas
18.1.11	4		Patient Representative	Cancer
19.1.11	5	GP	Patient Representative	Auto-Immune
20.1.11	6	DP	Patient Representative	Auto-Immune
21.1.11	7	HP	Patient Representative	Sensory Impairment
10.2.11	8	BP	Patient Representative	Cancer
11.2.11	9	EP	Patient Representative	Cancer
17.2.11	10	BE	Evidence Review Group (previously a committee member)	Represents many diagnostic areas
17.2.11	11		Evidence Review Group	Represents many diagnostic areas
17.2.11	12	CE	Evidence Review Group	Represents many diagnostic areas
10.3.11	13	FE	Evidence Review Group	Represents many diagnostic areas
11.3.11	14		Patient Representative	Diabetes
11.3.11	15		ERG related, supplementary**	Cooridnator between ERG teams
5.4.11	16	FC	Clinical Expert	Diabetes
7.4.11	17	BC	Clinical Expert	Diabetes
8.4.11	18	AC	Clinical Expert	Cancer
14.4.11	19	DM	Manufacturer	Represents many diagnostic areas
15.4.11	20	CM	Manufacturer	Represents many diagnostic areas
18.4.11	21		Clinical Expert	Auto-Immune
3.5.11	22	CA	Committee Member (Vice Chair)	Decison maker, deals with many areas
10.5.11	23		Supplementary***	Decison maker, deals with many areas
11.5.11	24	EC	Clinical Expert	Diabetes
16.5.11	25	BA	Committee Member (Chair)	Decison maker, deals with many areas
14.6.11	26	AA	Committee Member (Vice Chair)	Decison maker, deals with many areas
15.6.11	27	CC	Clinical Expert	Cancer
* consultant for small Pharma regarding NICE appraisal processes				
**member of National Coordinating Centre for Health Technology Assessment (NCCHTA)]				
***Chair of the Appraisal Appeals Committee				

Figure 10 - Showing observation details and conference attendance

Table Highlighting Appraisal Observations and Conference Attendance from Jan - Jun 2011		
Date	**Type**	**Details**
13.10.10	Technology Appraisal Observations	Pazopanib, public attendee
13.10.10	Technology Appraisal Observations	Aripiprazole, public attendee
10.11.10	Technology Appraisal Observations	Everolimus, public attendee
10.11.10	Technology Appraisal Observations	Bendamustine, public attendee
10.11.10	Technology Appraisal Observations	Golimumab, public attendee
10.2.11	Patient Conference Attendance	Cancer, networking, interview location
16.4.11	Patient Conference Attendance	Auto-immune, networking
10.5.11	NICE Conference 2011	Networking, interview location

Figure 11 - Showing the documents used in HTA networking tracing

Table Showing Documents Used in Tracing the HTA Network	
Type	**Details**
Appraisal Consultation Document (ACD)	Sets out preliminary recommendations
Final Appraisal Determination (FAD)	Sets out the final technology recommendations
Technology Appraisal Meeting Agenda	Given to the public attendee, available online
Technology Appraisal Meeting Minutes	Available online, post appraisal meetings
Guide To The Methods Of Technology Appraisal (2013)	Details the principles and methods used in Technology Appraisal
Literature about the Pharmaceutical Supply Chain	To gain a basic understanding of pharmaceutical research
Technology Appraisal Presentation Slides*	Given to the public attendee, information will appear in the FAD
Cost/clinical data from interviewees	Included surveys and papers
*Commercial in confidence data is blanked out.	

4.3.4 – Methods: Collected Data

The data collection period ran from January to June 2011. In total, five technology appraisals were attended, 27 NICE network individuals were interviewed and two conferences were attended. Figure 6 shows the interview details. Interviewees were sent a list of proposed discussion points prior to the interview. A copy of this document is attached as Appendix B. Consent was gained from interviewees for digital recording of the semi-structured interviews. In total, 1571 minutes of audio were recorded. Written notes were taken during interviews, but this was mostly to put interviewees at ease from constant eye contact. The average time of each interview was about 58 minutes. Interviewee names appear coded in the body of the thesis, ensuring anonymity. Revealing details have also been anonymised for example a rare disease is not mentioned by name but as a 'rare auto immune condition'. Other conditions are labelled as generally 'diabetes or 'cancer'. All interviews were transcribed. All transcripts were read in conjunction with listening to audio, to ensure accuracy.

The second research method, observations, took the form of observing technology appraisals and conference attendance. Figure 8 provides these details. Written notes were taken during the technology appraisals, mostly concerning the behaviours of different actors. Topic content was briefly covered but this was supplemented by copies of the overhead slides that were given to all public attendees, with confidential information blocked out. The information on these slides would appear in the Final Appraisal Determination (FAD) document, accessible by the public via the NICE website. Public attendees were also given a copy of the meeting agenda. The key networking for the first interviews occurred during the break sessions, with other public attendees.

The conference attendance included an invitation from a patient representative with a rare condition. Presentations were made by pharmaceutical researchers and clinical experts regarding the latest developments in the field, for an audience of mostly

patients. After this conference, they extended an invitation to write a small article explaining this research for their hard copy charity magazine. A copy is attached as Appendix B. One of the patient representative interviews took place at a patient conference for cancer. There was little to no networking, compared with the previous conference, due to time constraints. The final conference attendance was for the NICE conference in 2011, upon invitation from the Committee Chair that would later be interviewed. Networking with the key actor groups interviewed provided an opportunity to engage this research with interested audiences. This conference also provided the location for an interview with a Chair of the Appraisal Appeals Committee at NICE.

There was interaction with various documents throughout the data gathering phase. The non-human issue should be clarified at this point, in this ANT study. This thesis holds with Callon's (1986b) distinction that an actor can take any form whether it is human beings, institutions or natural entities. The agency of a non-human, to extend and circulate a controversy, determines its status as an actor. However, the interaction with documents during the data gathering phase is not seen in this way. The appraisal guides and structured NICE documents are seen as inscription devices, the tools used to transport a translated HTA process from the contributors/decision makers to the wider interested audiences. This is the same for other documents traced, which included confidential cost and clinical data constructed by some contributors (sent to me post-interview). For the purposes of full disclosure, Figure 7 shows the documents interacted with during the network tracing. However, it should be clarified that this thesis does not claim to have used narrative analysis as a research method.

4.3.5 – Methods: Analysing Data

The time from observing initial appraisal meetings and pilot interviews started a path of following actors to learn what was material to actor identity and the boundary of actor role. Emerging network elements of the HTA process, which included

diagnostic area, personality/background/motivation, repertoire of health economics, tenure of HTAs and contributor relationships, were explored and followed, through the rigour of further interviews. This answered the first research question of 'what network elements are revealed in speaking directly with human contributors and decision makers?'

Interview transcripts, guided by observations and the growing relations with the clinical context, were manually coded in a two stage process. Transcripts were analysed for instances of vacillation between the controlled-at-a-distance actor roles (from appraisal guides) and the boundaries drawn by the actors themselves. This first analysis discovered the ways in which the definitions and boundaries of the actors depended upon the diverse elements of HTA networking they had experienced. So, in this initial analysis, the data was coded for instances of actor identity, actor duties and actor perceptions on the HTA process as a whole. Vacillation between definitions from the appraisal guides and the direct accounts from the actors was linked to five elements of HTA networking (diagnostic area, personality/background/motivation, repertoire of health economics, tenure of HTAs, contributor relationships). These networking elements were used to manually code a second analysis of the interview data, in conjunction with explaining the instances of establishing actor duties, identity and overall HTA perceptions. These networking elements were now understood to identify the instances of actor identity/duty justification as actor enrolment of NICE defined actor roles. They also helped to frame these instances as network extensions.

Callon's (1986b) model has been established as both philosophical support to this thesis and as the structural platform for mapping and framing findings within this case study. The exploratory part of this case study is reflected in the use of the emerging network elements as a manual coding sequence for analysing the qualitative interview data. Establishing boundaries and roles as relevant to different entities in the HTA network occurs in the act of following the actors, if employing the three principles of agnosticism, generalised symmetry and free association. Letting actors speak for themselves, the emerging network elements revealed in their

accounts become the answers to the first research question. These network elements form the structural basis of chapter four, which contains the presentation of findings.

The explanatory part of this case study is reflected in the further analysis of Chapter five. Chapter five extends the analysis from having explored the HTA network elements that are revealed by speaking directly with the human contributors and decision makers. The collection of instances of actor identity establishment, that are linked by the effects of any of the networking elements, are examined for the four moments of Callon's (1986b) sociology of translation, to answer the second research question of 'what do these networking elements reveal about HTA calculative practices at NICE?'. For example, by virtue of being in a particular diagnostic area (which transports definitions and repertoire into the appraisal room) or being trained with an institutionally specific boundary of health economics (i.e. what is information), an actor's enrolment of their contributor duties will reveal complexities in calculative practice. These complexities are tied to the networking elements. The translation by actors, of the HTA process, if heard directly, will explain and demystify the black box of HTA calculation. So, the second phase of data analysis, which provides the format of chapter five, is to analyse the interview data for moments of problematisation, interessement, enrolment and mobilisation. These moments are cross-examined in relation to the general framing of actor identity instances and the more specific framing of the five networking elements.

4.4 - Chapter Summary

This first part of this chapter has outlined the core philosophical assumptions which have supported the theoretical framework developed in chapter one and two. An interpretivist philosophy was discussed as fundamental to this researcher. Accounting was argued to represent multiple interests which are both local and wider reaching. Accounting representations are contextually reflexive and depend on the social context for particularities of form. The particular social context of this thesis was confirmed as accounting/healthcare. Broadly categorised boundaries and

definitions from the accounting and healthcare literature were interpreted, forming the relations through which this thesis seeks to situate and advance. Stakeholder groups and reflexivity of accounting form were the two main boundaries which are drawn upon to frame relations between the clinical context of HTA and an accounting audience. The methodological advances made to this thesis by adopting an ANT framework were clarified. These included the support of similar philosophical beliefs, providing a structural platform for the size and relativity issue in accounting. It also included advancing the question of what is information. Accounting's use of ANT answers this question and provides guidance in the choice of methods employed for an ANT study. Some of the main criticisms of ANT were outlined and including claims of apoliticism and the controversy of status surround non-human actors.

The second part of this chapter has outlined the methods employed in gathering data for the NICE case study. The case study method was overviewed and the appropriateness of the multiple methods utilised was justified. The principal methods of data gathering were observations and semi-structured interviews. An overview of all data gathered was given. The way in which data was analysed was described. This included an initial two-stage analysis of the interview data, supplemented by observations where appropriate, which first identified the instances where actors established their identity, duties and overall perception of the HTA process. The vacillation between these boundaries and definitions and those given in the controlled-from-a-distance appraisal guides were tied to emerging instances of diverse networking elements. This will be the focus of Chapter Four. These networking elements were generalised to five points and used as the second step manual coding tool. The description of data analysis then concluded with the final step of analysis. The boundary and definitions of actors, tied to the network structure implied by the five points, will be further tested for Callon's (1986b) four moments of translation in chapter five.

CHAPTER FIVE
INSIDE THE BLACK BOX: FINDINGS AND ANALYSIS

5.1 - Introduction

This is the first of two chapters which will present and analyse findings from the case study at NICE. The HTA process is the empirical boundary for answering the first research question: what network elements are revealed in speaking directly with HTA contributors and decision makers?

The chapter will explore the opening of the black box of NICE HTA decision making. The HTA process is described in publicly available user information – see NICE (2013). The HTA process operates within a centralised framework. Calculative practices and definitions adopt a "consistent approach" (NICE, 2013; pp. 33) however, are open to controversy surrounding "choices that are essentially value judgements" (NICE, 2013: pp. 34). Using core principles from Actor Network Theory (ANT), these controversies are re-examined by speaking directly with those who contribute and debate evidence for decision making. The appraisal guidelines are taken as what Latour described as the "final nth level inscription" (Latour, 1987: pp. 234) and are re-examined, with a view to directly meeting the "people in the land" (Latour, 1987: pp. 234) which the appraisal guidelines have inscriptively transformed and transported.

In meeting with these HTA contributors and decision makers, key networking elements were revealed, which influence perceptions of NICE calculative practices. These include the diagnostic area of the technology under appraisal, the personal qualities and motivation of the contributor/decision maker, the repertoire of health economics employed by actors, the tenure of HTA experience that an actor has and the complexity of contributor relationships and dynamics. The fusion of these networking elements reflects the complexities of the network associations that actors have with the HTA process.

5.1.1 – HTA Contributors and Decision Makers

In chapter one, I gave an overview of the HTA process and NICE. This provided the necessary context for building a theoretical framework for accounting and health research. In line with the development of the theoretical framework and empirical boundary as outlined in chapter three, the detail of material actors and calculative practices is now overviewed.

The appraisal guide (2013) describes a diverse network of involvement from contributors. In detailing the list of sources of evidence received from any group during the entire appraisal process, the guide includes: an independent academic group, manufacturers and sponsors of technologies; national patient or carer groups; healthcare professional organisations; clinical specialists, commissioning bodies and patient experts; commissioning bodies (NICE, 2013: pp. 25). The guide describes the processes for submitting written evidence from these sources.

The empirical boundary surrounds the people involved in actual appraisal committee decision meetings. Within the boundary of those involved during the appraisal meeting, NICE states that there are three groups who are invited to attend and contribute: clinical specialists, commissioning experts and patient experts. They submit a short written view beforehand, for the purposes of informing those who could not attend the meeting. Their oral contribution is intended to "explore the evidence that is provided in the written submissions from consultees" (NICE, 2013: pp. 30).

From a lay-perspective and prompted by the ANT framework, the list of participating groups here are those who are directly present on the decision-making day. This list is taken both from NICE's (i.e. as the focal actor who is controlling-at-a-distance) perspective via the appraisal guides and from personal observations of material

contributors during appraisal meetings and from interviewee accounts[11]. Those involved include the following groups: decision makers (committee members, Chairs and vice Chairs), manufacturers, Evidence Review Group's (ERG), patient experts and clinical specialists. Figure 12 shows the definition of each of these groups, taken from the appraisal guide glossary (NICE, 2013).

[11] Confirmation of the 'material' contributors within the appraisal meeting network experience resulted in a similar list as described by NICE (regarding who is involved as a physical representative and evidence giver) except for the group, consultees and commentators. During (lay) observations, there was no witnessing of material commissioning expert and other involvement. Through a number of interviews it came to be an emerging theme that the other actor groups did not consider these roles to be material.

Role	Definition
Patient Expert	"Acts as an expert witness to the Appraisal Committee. Patient experts have used the technology either personally or as part of a representative group. They provide a view on the risks and benefits of the technology from personal experience as a patient or carer, and an understanding of the wider range of patient and/or carer views." (NICE, 2013: p. 97)
ERG (for STA's)/Assessment Group (for MTA's)	"An independent assessment group commissioned by the NHS Research and Development Health Technology Assessment (HTA) programme to produce an independent assessment of the evidence submitted by the manufacturer or sponsor of a technology being appraised within the single technology appraisal (STA) process." (NICE, 2013: p. 91)
Manufacturer (NICE, 2013)[12]	"Submissions are invited from manufacturers and sponsors (organisations who market the technology under licence) of the technology or technologies being appraised. Manufacturers and sponsors should identify all evidence relevant to the appraisal." (NICE, 2013: p. 26)
Appraisal Committee	"A standing advisory committee of the Institute. Includes people who work in the NHS, people representing patient and carer organisations, lay members, people from relevant academic disciplines and the pharmaceutical and medical device industries." (NICE, 2013: p. 83)
Clinical Specialist	"In technology appraisals, clinical specialists act as expert witnesses to the Appraisal Committee. They are selected on the basis of specialist expertise and personal knowledge of the technology and/or other treatments for the condition.

[12] Taken from the main body of the NICE (2013) appraisal document as there is no equivalent glossary definition.

	They provide a view of the technology within current clinical practice, and insights not typically available in the published literature." (NICE, 2013: p. 85)

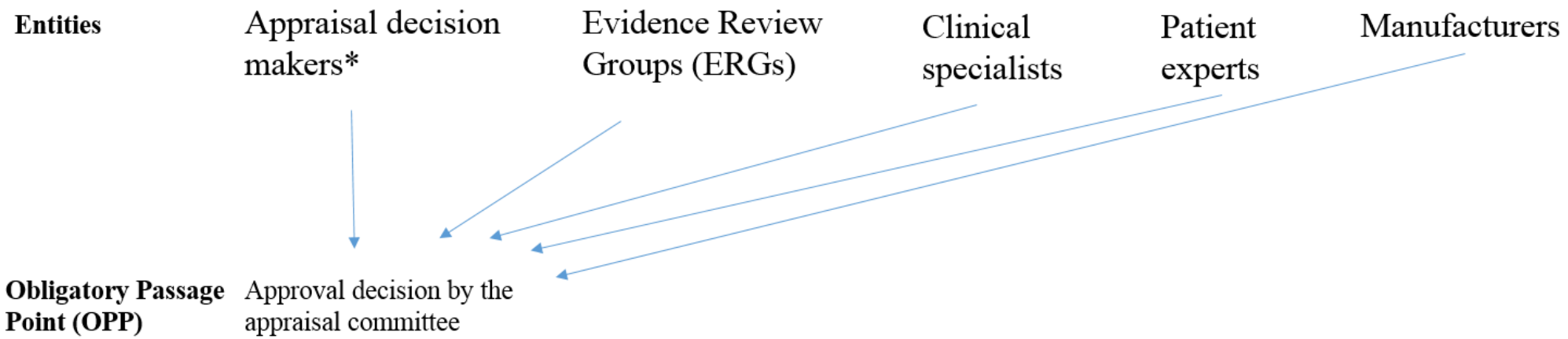
Figure 12 - Showing the actor group definitions as defined by NICE (2013) glossary

The choice of who to interview involved employment of ANT principles. During initial observations, I became familiar with the entities referred to throughout the appraisal guide. Particular contributor dynamics and interactions revealed what might be material to answering the research questions. Latour (1987) cautions the observer against automatically assuming that they know what is material to actors within the context they are observing. As a clinically-lay researcher, I approached pilot interviewees to confirm the materiality of the chosen groups as the main voices heard in evidence contribution and decision making. For the sake of timing and not endlessly questioning the mediators (Latour, 2005) I drew an empirical boundary around speaking with actors who had appeared as contributors and decision makers at appraisal meetings.

The Obligatory Passage Point (OPP) in the HTA case study is the approval decision of healthcare technologies for the public which is funded by the NHS. This is the element of control which NICE uses to retain control of the controversy, enrolling those deemed necessary to clinical/cost efficiency appraisal on healthcare technologies. The introduction clarified the independent relationship of the appraisal committee decision makers and NICE as an entity. The appraisal committee members are not precluded from using non-reference case analyses if appropriate (NICE, 2013). The reference case is the inscriptive device used to guide decision makers, but their defined role necessitates flexibility with regards to judgement (NICE, 2013). For the purposes of demonstrating the actor groups associated with the controversy, the appraisal decision makers are shown in the position of controlling the OPP, which they do. The independence of their relationship with NICE is acknowledged, but it is clear that they are still bound by NICE inscriptive

devices, at least to some extent. Similar to Figure 6 (see section 3.3.2), Figure 13 shows the actor groups associated with the controversy of HTA calculative practices at NICE. This is a development of the conceptual figures which appear in earlier chapters. Callon's (1986b: p. 20) Figure 1 (in thesis Figure 6) showed the actor groups associated with the controversy at St Brieuc Bay. In Figure 13, the entities involved in the HTA controversy (because I am re-opening the black box) are outlined as passing through the OPP of the approval decision by the appraisal committee. Achievement of each entity's goal is subject to passage through the OPP which is controlled by the appraisal decision makers. The identification of actor groups was guided by the findings from chapter one, which showed that the involvement of multiple healthcare players in decision making was recommended to avoid the reduction of healthcare complexity by an economic rationale. It was also confirmed by actors who were followed from HTA meeting observations and pre-reading for example see Figure showing the diagrammatic flow of the scoping and appraisal processes, with actors featured throughout.

Figure 13 - Showing the actor groups associated with the controversy of HTA at NICE



*see Figure 15

5.1.2 – Calculative Practice

When making their decision, the Appraisal Committee abides by certain principles and benchmarks. The overarching definition for clinical effectiveness (in normal practice) is taken as the ability to generate a health benefit over and above potential harmful effects and opportunity costs. The overarching definition for cost effectiveness is stated as the outweighing by the technology's health benefits of alternatives: "a technology can be considered to be cost effective if its health benefits are greater than the opportunity costs of programmes displaced to fund the new technology, in the context of a fixed NHS budget," (NICE, 2013: pp. 14). As an independent body, when the committee refers their decision to NICE, they have discretionary power to consider "those factors it believes are most appropriate for each appraisal" (NICE, 2013: pp. 62). Decision makers abide by social value judgement principles set out by NICE when considering clinical/cost effectiveness of technologies. NICE follows the principles of the Health and Social Care Act (2012).

The issue of consistency in the calculative practice of diverse HTA's is governed by the "reference case";

> "The Institute has to make decisions across different technologies and disease areas. It is, therefore, crucial that analyses of clinical and cost effectiveness undertaken to inform the appraisal adopt a consistent approach. To allow this, the Institute has defined a 'reference case' that specifies the methods considered by the Institute to be appropriate for the Appraisal Committee's purpose and consistent with an NHS objective of maximising health gain from limited resources... There is considerable debate about the most appropriate methods to use for some aspects of health technology assessment. This uncertainty relates to choices that are essentially value judgements; for example, whose preferences to use (patients or the general public) for valuation of health outcomes. It also includes methodological choices that relate to more technical aspects of an analysis; for example, the most appropriate approach to measuring health related quality of life. Although the reference case specifies the methods preferred by the Institute, it does not preclude the Appraisal Committee's consideration of non-reference-case analyses if appropriate." (NICE, 2013: pp. 33-34).

By talking directly to the evidence givers/decision makers, the black box of HTA network elements experienced in the diversity of appraisal experience is argued to reveal aspects of appraisal meeting dynamics - for example informal meeting etiquette, discretionary power and group dynamics - which are translated by interviewees and influence their perceptions of calculative practice. The divergence from the HTA process overview in interviewee accounts is assessed through Callon's (1986b) sociology of translation. In justifying their roles and duties as actors in the HTA process, interviewees describe different forms of calculation. Figure 14 features some of the named practices mentioned, with definitions taken from the NICE appraisal guidelines.

Calculative Device	**Definition**
Reference Case	"When estimating clinical and cost effectiveness, the reference case specifies the methods considered by NICE to be the most appropriate for the Appraisal Committee's purpose and consistent with an NHS objective of maximising health gain from limited resources." (NICE, 2013: p. 98)
Quality Adjusted Life Year (QALY)	"An index of survival that is adjusted to account for the patient's quality of life during this time. QALYs incorporate changes in both quantity (longevity/mortality) and quality (morbidity, psychological, functional, social, and other factors) of life. Used to measure benefits in cost–utility analysis." (NICE, 2013: p. 97)
EQ-5D	"The EQ-5D is a standardised and validated generic instrument that is widely used and has been validated in many patient populations. The EQ-5D comprises 5 dimensions of health: mobility, ability to self-care, ability to undertake usual activities, pain and discomfort, and anxiety and depression. For each of these dimensions it has 3 levels of severity (no

	problems, some problems, severe problems). The system has been designed so that people can describe their own health-related quality of life using a standardised descriptive system. Given the need for consistency across appraisals, one measurement method, the EQ-5D, is preferred for the measurement of health-related quality of life in adults." (NICE, 2013: p. 44)
Incremental Cost-Effectiveness Ratio (ICER)	"The ratio of the difference in the mean costs of a technology compared with the next best alternative to the differences in the mean outcomes." (NICE, 2013: p. 93)
End of Life Criteria (life-extending treatment at the end of life)	"In the reference case, the Committee will regard all QALYs as being of equal weight. However, when considering the overall health benefits, the Appraisal Committee can accept analysis that explores a QALY weighting that is different from that of the reference case when a technology appraisal concerns a 'life extending treatment at the end of life', or in other circumstances when instructed by the NICE board." (NICE, 2013: p. 68)
Comparator	"The standard intervention against which the intervention under appraisal is compared. The comparator can be no intervention, for example best supportive care." (NICE, 2013: p. 86)

Figure 14 - Calculative measures named by actors and their definitions by NICE (2013)

These calculative practices are featured due to their discussion by interviewees – there is no prioritisation of order or selection process. This is an example of both following the actors and allowing actors to speak for themselves, both important ANT principles.

The empirical boundary concerns the HTA network elements in the black box of the appraisal committee decision meeting. Empirical contribution of this thesis adds to the transparency of what is made publicly available regarding how the appraisal

committee makes their decision. There is considerable guidance regarding the efforts to which the Appraisal Committee goes to, in order to maintain transparency of processes via guidance documents such as the FAD and the ACD. However, by opening up the issue of discretionary power vis-à-vis the HTA network elements of appraisal decision meetings, this thesis contributes to a wider understanding of HTA processes.

In cross referencing with the relevant accounting/healthcare literature and establishing the appropriate audience, there are several points to be made. The acknowledgements of controversies and uncertainties in appraisal methods, for example in the context of the reference case, are consistent with the findings from Chapter One. The decisions made by the committee are based on the inter-relation of cost AND clinical data: the hybridisation literature - see Kurunmaki (1999, 2004) - is of relevance here.

There are similarities between the concerns and technical uncertainties of accounting-based DRG calculative practices and the inter-relations of cost/clinical HTA decision criteria. One similarity is the potential for methodological uncertainty, particularly related to diagnostic network elements, in different settings – see Chua (1995), Soderstrom et al (2006); Ernst and Szczesny (2005) and Gaal et al (2005). Another similarity is the interplay of multiple healthcare players in decision making – see Chapman et al (2014).

With relation to the uncertainties in HTA process from an international audience, the consistency of calculative practice is actively debated. For explicit links to HTA processes, see Arellano et al (2011), Facey et al (2011) and Leggett et al (2012). For more generally links with regards to healthcare see Clark and Weale (2012). For discussion about ethics and social value judgements see Clark and Weale (2012), Littlejohns et al (2012), Pantelli et al (2011), Hofmann (2008) and Lehoux and Williams-Jones (2007).

5.2 – Diagnostic Area as a Networking Element

In this section, evidence is presented which highlights the variability of HTA perceptions which are related to diagnostic area. This element of networking is explored by speaking with contributors and decision makers who work at appraisal meetings. This is what Latour (1987) described as speaking to the "people in the land" (Latour, 1987: pp 234). Dissenters can challenge the stability of the black box by reverse engineering the inscriptive devices used to sustain a given translation.

> "We know from earlier chapters that these translations and representations may be disputed, but this is not the point here; the point is that, in case of a dispute, other tallies, code words, indicators, metres and counters will allow dissenters to go back from the nth level final inscription to the questionnaires kept in the archives and, from it, to the people in the land." (Latour, 1987: pp. 234)

Going back from the final inscription, to the questionnaire and finally to the people in the land is what is happening in the NICE case study. Going back from appraisal guidelines, which are the final level of inscription, I am going back to the appraisal meetings and finally to the contributors and decision makers that network at them. One of the first material observations I made from going back to the appraisal meetings, was to realise that the diagnostic area to which an HTA was concerned was one of the biggest variables in applying consistent calculative practice. Multiple perspectives are considered in this presentment of data which relates to several general medical areas for example several types of cancer, diabetes, rheumatoid arthritis. The data also refers to a few rarer autoimmune conditions[13].

GP was the chief patient representative for a technology that treated a rare, autoimmune disorder. The specifics of the condition mean that those with a more serious diagnosis are at risk if they leave their homes, so those with more severe forms are not usually chosen as the patient representative at appraisal meetings. GP felt that the committee perceived the impact of the condition on patient lives to be

[13] For the sake of anonymity, I have used the term 'autoimmune' in place of identifying very rare conditions as interviewee identity would thus be easy to Figure out.

less severe than it really was. Specific aspects of the medical condition are the topic of GP's anecdotes regarding the perceived strengths and weaknesses of the HTA process. Due process is perceived as not fully sensitive to the rarity and heterogeneity of patient cases.

> "I realised that they hadn't understood how bad it is for some people. Mild...sufferers may not be able to go on holiday and these are trivial things, but I can understand why you wouldn't want to give an expensive drug. The people we represent are housebound. They have too many nosebleeds that they cannot go out. They are frightened of meeting anyone with a cold because that triggers a nosebleed. They are rushed off to A and E with terrible bleeds and that is not nice. NICE had failed to understand that. I took along a patient testimony who had a strong case...The one I did take originally had low levels and NICE took him as all patients (to be the base case). When they read the testimony they did listen and then they asked questions referring to that patient. You really have to get that over. Not like with cancer because everyone knows someone with cancer. Rare disease people have a hard time on this." (GP)

Taking the base line case for the condition from this one mild patient is inferred as an aspect of the centralised reference case approach taken by the appraisal committee. In this case, it hindered GP from fulfilling their perceived representative responsibilities.

One theme from this networking element included the contrasting findings from contributors who are involved in appraisals for chronic conditions and end of life conditions. A fusion of multiple network elements is evident in much of the anecdotal evidence for. DP is the lead patient representative for a chronic auto immune condition. They have been involved with HTA's since NICE was instituted. DP's tenured experience has meant that they have developed a more robust patient-level understanding of the technical cost/clinical data. They perceive differences in calculative practice between chronic and end of life related appraisals. "There seems to be more emphasis or more importance put on extension of life than quality of life for people with chronic conditions. Is it more important that you spend money on a very expensive drug to extend somebody's life who is going to die by three months

or give a 23 year old a drug that is going to enable that 23 year old to get a job and work and support themselves and be independent for the first of their lives? We seem to lose out all the time," (DP).

EC had experience in contributing evidence as a clinical expert, to a diabetes related appraisal. Their perceptions of the HTA process were a close approximation of the actor identity and duties associated with a clinical expert, as explained in the appraisal guidance documents. In establishing an initial view of NICE's function, EC qualified that there is difference between an "intended outcome" and the "reality" of the consequences of published appraisal decisions. This was related to particularities of diabetes as a medical condition.

> "I think the majority medical view of NICE is that it acts as a rationing body for costs and it is quite interesting to see how they gauge that while at the same time looking at other aspects like patients choice. I felt that my role as an expert coming from the background of a Diabetes specialist setting was to enable the drug to be available for at least specialist use. That was my agenda. The fewer restrictions on prescribing that I could try and convince were appropriate, the better. NICE would just issue guidance and clinicians are of course free to choose what is appropriate for the individual guidance. The reality is that the NICE guidance goes out and there is an attempt to limit everyone's practice based upon that guidance. I would go to NICE, advise them about guidelines, those guidelines would come out and someone would tell me that I had to adhere by those guidelines. These are guidelines for general people throughout the U.K. Predominantly aimed at GP's. In reality they are used to limit specialist prescribing for diabetes". (EC)

I interpret EC's comments for their views on calculative practice. The centralised nature of NICE guidance is shown to hinder the ability of EC to provide the best possible specialist care. The motivations and goals of EC are not fully satisfied on their journey through the black box. They describe a reality of NICE purpose and calculative function. EC has not enrolled this, has not been convinced by the controversy.

One recurring theme from interviews was the issue of a pecking order in medical conditions. I interpret this theme in terms of the ANT idea of black boxed controversies that actors bring to the appraisal i.e. thoughts, experiences, assumptions about particular medical conditions that vary in the minds of contributors. To maintain control of the black box, NICE needs to convince this audience of multiple healthcare players. There are a higher number of complex groups to consider than the fishermen, scallops and researchers of Callon's (1986b) translation. One of the contributions of this thesis is the advancement of a complex translation, in consideration of many healthcare players and in a contextually technical empirical site.

Preston's (1992) comments regarding the importance of placing technologies within the appropriate social, historical and political discourse are made relevant in considering the potential diagnostic controversies that can be transported back to the (centralised) appraisal room. Preston et al (1997) extend this point, regarding Diagnosis Related Groups (hereafter DRG) technologies. The dangers of a narrow, reductive calculative practice were interpreted in Preston et al's (1997) findings: "it rendered the life and death decisions inherent in rationing invisible" (Preston et al, 1997: pp. 161). The variability described in the perceptions of HTA contributors/decision makers in this thesis seek to address this by revealing aspects of calculative practice, which although centralised, must deal with a high number of complex groups (different patient populations).

BA was an experienced Chair of one of four HTA committees. They viewed current statistics (at the time of interviewing) and commented that NICE does say yes to cancer drugs quite often. While appreciating the appeal of including wider societal costs, they commented that the inclusion of carer costs would not automatically result in a more favourable spread of yes decisions as the "thinking" was at a very incomplete stage: "The danger is of course, you suffer greatly if you are a victim of a shortage of capability in the NHS and you've got one of the badly done by diseases," (BA). BA, who had vast experience as an appraisal decision maker, seems to confirm

the idea of diagnostic variability, at least as regards capability of consistently meeting patient need, in a centralised health care body.

BA also clarified an earlier observation made at a public attendee session. The technology was for a mental health condition and I perceived a marked shift in behaviour and attitude by the committee members. I questioned BA as to why the previous meeting, relating to a cancer technology, had been met with (what I perceived to be) much more attention from committee members. The first meeting had been an initial appraisal meeting whereas the second had been that technology's second meeting. BA advised that much more attention is naturally paid to the new information being given in the first appraisal meeting for that technology than a revisit to the one following that, particularly if it just before lunch time. On the other hand, CA, an experienced Vice Chair who happened to be present at the meeting in question, stated that; "it was very interesting to see how the room was populated compared to the one with the cancer drugs," (CA). It is interesting to see the variances in opinion regarding this incident.

The original Wishart (2009) article and the thesis interviews include several claims on the distinction between the natural human sympathy that decision makers feel for the majority of appraisals and their duty to address all clinical/cost efficiency evidence to make an informed decision. However, this thesis explores the very human element of how decisions are reached. Does an unstated (perhaps unconscious) hierarchy of medical condition exist in the minds of decision makers, that orders preference of one appraisal over another – despite a consistent calculative philosophy described in appraisal guidance documents?

The incident described above relates to the change in appraisal committee numbers based on diagnostic condition and time of the day. A related example features DP, who felt that the timing of the appraisal in particularly was in relation to the fact that they presented a chronic condition as opposed to an end of life condition. After being kept waiting for an hour and a half due to overrun from the previous meeting, they

were told that the meeting might not be able to go ahead as they were unsure if they had met quorate

BM was part of a consulting group that aided manufacturers in their initial NICE appraisal submissions. In a holistic discussion about the benefits of a centralised decision body like NICE, BM hypothesised how different diagnostic areas would fare in a "post-code prescribing" format.

> "If you didn't have NICE you would have what you had before with post-code prescribing and who shouts the loudest will get the most. You will not find anything ever turned down for children. Photogenic young mothers will get everything whereas the elderly will really suffer. Mental health will suffer a lot... With just patient advocacy – the ones who could shout the loudest, middle class people who are organised well. Arthritis would do very well because it is people who have got to that stage in life where they have a bit of time and motivation and also they can argue for themselves and say 'this severe disease is debilitating…' whereas say schizophrenia: you wouldn't see a schizophrenia group organising themselves so well." (BM)

BM's comments are taken as conjecture, but still highlight the ways in which different diagnostic areas influence the consistency of the applied appraisal calculative practices.

AA, an appraisal decision maker, discussed the different patient motivations that might occur in different medical areas, particularly end of life and cancer technologies[14]. AA links this to the potential impact for HTA calculative practice.

> "I think cancer is really interesting in this. End of life doesn't mean cancer, but all of the ones being dealt with under end of life have been cancer. I personally think it's fascinating what has been decided about quality at the end of life, which without any empirical basis is at the level of the individual. I have elderly relatives and I'm pretty sure they don't value the last few years of their life more than they did the two years when they were my age. Indeed I know my mother would value a year of her life as considerably less than mine. So I think it's

[14] End of Life Technologies are given a higher threshold of cost than others. This is detailed in the NICE context section in the beginning of this chapter.

> interesting why we are giving this privilege to the last two years of life. Part of that is driven from our social attitudes towards cancer. Cancer may not be life threatening. Severe Congestive Heart Failure has a worse five year survival than most cancers. I think the point is that there are social attitudes towards conditions. Cancer is very important, Schizophrenia is less so. We did one on injecting drug users and giving them opium maintenance. That would be one where people would find it much more worthy to deal with cancer unless something kicks off and there is a disempowered minority that are being abused. We then feel shock and horror about that. I think it's quite right, with the exception of the end of life thing...we don't take any regard at all to whom and when the quality is approved. If you got us all together, we wouldn't say that some people are worth more than others, but how much more. There is a range of ISA's that have been accepted over 30,000. But we don't say it's the end of life therefore the threshold becomes whatever. That's' not a process. Though it seems it might be getting in that direction. The committee isn't really constituted to work out the weight of these things. It's a funny group of people because if you were doing a guideline you would get experts in the disease wouldn't you? And if you were doing research funding you would want experts in methodology so they can judge between a good study and a bad study so its somewhere in between. So we have some lay and some less lay people and then we've got more methodological people and then some of us fit into a couple...we are a mixed bag, but certainly are not a citizen's panel to decide who is worth more than whomever else. I'm glad we don't take those decisions. We are effectively working out which technologies work one at a time and their value to the NHS." (AA)

Diagnostic area as a variable networking element is addressed in AA's testimony. I interpret AA's comments regarding cancer to mean that public perception often equates cancer with an end of life condition. The black box surrounding end of life conditions means that actors are transporting controversies attached to cancer, into the appraisal process. They are using that as a basis of equivalence, for example dissatisfied contributors might perceive unfairness in a higher priced ISA that gained appraisal approval. The particularities of diagnostically sensitive cost/clinical data are appreciated by the technically minded but public perceptions of a condition like cancer hold powerful associations for many.

AA's testimony also reveals a desire to distance their decision making role away from a human setting a value to another human life. AA qualifies the calculative

practice of end of life criteria but admits to the committee is not "constituted to work out the weight of these things," (AA).

EC made similar comments to AA's regarding the public's understanding of certain conditions and how that feeds into the structure of NHS policies. For example they stated that cancer, when identified, was an efficient identifier and that processes to diagnose within NHS waiting times were quite strict when compared to the longer waiting periods for patients with non-life threatening conditions that still affect quality of life.

> "If you have a suspicion that you have stomach cancer you need to have the test done in two weeks. Because it has the label of cancer it gets done very quickly as opposed to somebody who has painful hips, they can sit around and wait eighteen months. Or if you have gallbladder stones, it is not going to kill you so you will just be in pain for four to six months. There are certainly areas that are more sexy than others. And the charities are more professional and bigger for cancer so committee members at Cancer meetings that walk out could be documented by the next bulletin from the charities. Other diseases' charities have lower levels of enthusiasm. Diabetes is an interesting one because when I give presentations within the hospital here and people have done well, we ask how much it costs. People think it's cheap, ninety pounds on the grand scale of things doesn't seem like a lot...the issue is there are three million people with the condition and that's why it's a big deal. Diabetes accounts for seven percent of the NHS drug budget so it gets a specific focus whereas other conditions do not." (EC)

EC spoke about the resources available at the hands of "sexier" diseases, which is interesting when we place the remit of the Appraisal Committee and indeed the remit of NICE in a wider network of functioning as part of the NHS.

BE, an ERG director, spoke of the variability of diagnostic areas (in this case, cancer) on the technical measures used, in this instance the QALY. BE described their appreciation for the QALY and its ability to render "everybody equal". They discussed their confusion at the proposals for extra funding towards cancer (in England) and equated it to a violation of the basic principles of the QALY. They were also heavily critical of the references used in the aforementioned proposal:

> "You are violating the QALY and saying that cancer is more important in England. What happens when there is an explosion of heart drugs? It violates the assumption of the QALY to make health care decision making...Why cancer? Then you are choosing it on the basis of a disease rather than just trying to save lives. It is saying that we are going to be giving more significance to cancer," (BE).

CM, a manufacturing representative and member of BM's HTA consultancy company, also discussed technical measures in the context of diagnostic variability. They described how, if a drug were an oncology technology, then the power of public pressure could be used. CM would advise manufacturers, in their consulting roles, that oncology submissions could more effectively use such technical measures as end of life criteria and patient access schemes than non-oncology submissions.

> "If it's an oncology drug we can build up public pressure and use the end of life criteria as well as work with patient groups to get a higher willingness of pay accrued. But if it's a standard drug we can't push it further out and have to see what we can do in terms of patient access schemes. Or we don't have to submit at all, which triggers NICE to submit termination guidance. International press would see that as a negative. If we submit we have to see how we make our case in cost effectiveness, and if it's the right one. It's a bit of negotiation when you are going into the appraisal committee," (CM).

CM also later discusses cancer as a highly political issue. CM has shown how different diagnostic areas can affect the centralised calculative practices of different HTA's. CM further discussed their own personal opinion on the politics behind different diagnostic areas:

> "I could make a daily mail style case to people but if we didn't have NICE, we would end up with a 'who shouts the loudest' gets the most system. Photogenic young mothers will get everything, children will never suffer but elderly and mental health would suffer under a 'without NICE' system i.e. patient advocacy, well organised middle class people. So things like arthritis would do well as the patient groups have the resource and time, but I can't imagine things like a Schizophrenia society organising themselves," (CM).

I interpret CM's comments as reflecting different ways in which social ties are assembled in diagnostic controversies. The inscriptive images which are transported into the appraisal room at the signal of the word 'cancer' or 'diabetes' or 'juvenile schizophrenia' reflect different sets of resources and relations within diagnostic networks. CM cannot imagine a "Schizophrenia society coming together"; the assemblage of 'cancer' and 'diabetes' voices are very recognisable to CM.

AC, a clinical specialist for a rare type of cancer, demonstrated a close translation of duties with that described in the guidance documents. In describing their duties during an appraisal, AC stated that ''We are there to answer contextual questions of what current treatment is throughout the UK, and how it fits into that, more than anything else...you are there to represent patients but also to represent your profession, because over all the view would be very similar on a drug like this," (AC). AC's belief that the views would be similar is interpreted to mean that there are black boxed opinions within diagnostic boundaries.

5.3 – Personality, Background and Motivation as a Networking Element

In this section, evidence is presented which highlights the diversity in HTA accounts which is influenced by the personal aspects of the actor for example confidence, resentment, and bewilderment. Actor motivation for appearing at appraisal meetings (and passing through the Obligatory Passage Point, hereafter OPP) is also shown to influence actor translations of a centralised HTA process.

EP belonged to a small patient organisation for a rare form of cancer. A statistician by profession, they had distinctly negative impressions of their HTA experience. Their motivation for appearing at NICE was due to the positive experience they had as a member of a drug trial. Due to their participation in that trial, they described their "luck" at being given the drug free for the rest of their life. This "luck" is further emphasised at their "relief" at not having to be dependent on the HTA decision process.

> "Because I was on the original trial protocol, they said I could have it free for as long as I lived (which they thought would be about 18 months). That is my situation, so I don't have to worry about people keeping me alive. I am a taxpayer and what I see in that capacity is that it costs $10000 to kill a member of the Taliban." (EP)

This was quite literally the first thing that they said, an indicator of what proved to be a patient expert who seemed to be disillusioned with NICE methods. EP clarified their role as possessing a lack of power and influence. This disillusionment is expressed in their account of less than rigorous evidence input mechanisms

> "I have spoken to people in NICE and they were interested, but it never ends up in the report. For example a woman said she would like to meet me and discuss what I had said, but a few weeks later I got a letter closing it all off…" (EP)

EP was an academic by background and their motivation for contributing to the appraisal process was tempered by feelings of relief at being secure in their own continuing treatment of the technology (and thus not having to pass through a NICE controlled OPP). Their account of HTA networking reveals dissatisfaction with how their contribution is used in decision making. Several of EP's anecdotal points are interpreted as evidence that personal history and chosen profession have an impact as a variable networking element. Due to their career as a statistician, EP felt they had a good understanding of the technical modelling used by NICE. They made the point that this may have come across early on, as some of the things said during their appraisal experiences, were perhaps less tailored to a "summarising for patients" style: "They thought that me dead was only 11% better than me alive. I think a lot of it is ego trips. If you are not a loudmouth academic like I am then you could get intimidated...They used to apologise to me for showing the life expectancy cards as at the time it was 18 months into my diagnosis," (EP).

CM clarified the differences in personality that they had seen during their committee meeting tenure, stating that the patient representative group was the most variable: "The patient reps are the most variable. You can have very good and eloquent patient person who can explain why they want this and why it will make a difference. And

then you can have ones where they are apathetic, don't understand and aren't charismatic. They have perhaps been chosen for seniority in the society rather than what they can actually provide," (CM).

GP described an instance of their complete dissatisfaction with the 'performance' of the manufacturer representative. They felt that the rep was 'assigned' this appraisal. GP's familial motivation prompted them to extend their networking involvement by contacting the manufacturer.

> "I was worried as the person running the (company name) had no interest. I think (representative name) had been assigned this (rare auto immune) drug and their approach was very laid back. I felt I was doing all the work. I wrote to (company name) afterwards and said they hadn't presented a good case or done their homework. I felt they were the least professional on the committee. To them it is just work – no more than that. It is just a job and for us we are speaking out for patients, a totally different scenario," (GP).

This was particularly interesting given that the majority of responses regarding the manufacturer dynamics within HTA meetings are that they are not given enough leeway in answering or inputting in general.

BA was an appraisal committee decision maker. Of all appraisal committee decision makers that were interviewed, they were the most experienced. They were confident and admitted to having a well known voice at NICE. BA felt that they had a very good understanding of everything that happens during the appraisal and stated that there is a "bit of a grey area between what is formal and what is informal" (BA). BA highlighted several instances where aspects of decision making varied with the individual preferences of the Chair.

> "So the structure of the meeting is partly formal and obviously partly in my head as the Chair... there are two types of meeting - you should know that: there is an ACD when we first see a topic, then the FAD when we see that topic again after consultation but in the ACD there is then a formal presentation by two of the committee members, whom I will have chosen - I work through everybody over the year -

> who will present clinical and health economic aspects respectively. And it's a question of Chairman's preference as to whether they proceed by allowing interruptions during that presentation or whether they run through it completely and take a discussion entirely afterwards. My preference is for the latter even though they are sometimes fiercely complicated topics where it's good to put a thing on hold but I'd prefer to do it by making a note of which slides we should go back to, if there are things to discuss," (BA).

In a role which calls for being both a decision maker and a coordinator, BA has shown the inevitability of the variable effect which personality (as a networking element) has on the divergence of HTA experiences. In BA's comments, the fusion of the network elements identified is apparent. BA feels confident in establishing a preferential system for coordinating the human element of appraisals. This confidence is built from vast experience and a strong association with both NICE's institutionalised calculative practices and other wider models. Small things in BA's comments highlight examples of personally variable inscriptive devices that establish BA's preferred style of coordination. These included choosing to make comments on slides and the choice of speaker for lead presentations (especially in the context of "fiercely complicated" topics).

The human focus of this case study is highlighted in BA's further comments. The politics of appraisal group dynamics are revealed only by going back to the "people in the land" (Latour, 1987: pp. 234): "The strategies are one) get the best people for the most difficult topics two) check slides beforehand and suggest one or two extra additions three) of course if there had been any gaps, make up for it in the discussion. But they are usually quite good," (BA). Other examples from BA show the effect of Chair's preference (i.e. personal qualities and motivations). BA was very forthright in describing the group politics under their aegis.

> ''If it is the experts or the patient experts I allow them to start to speak about the topic generally, if they choose to use that question to do so. If it's the manufacturers, I don't. They are not around the table they are there to answer questions after all. They originally weren't there at all. They lobbied to be there and the lobbying was on the basis that when they are in the public, they were frustrated by the fact that they

> sometimes have answers to factual issues that they weren't allowed to give because they were in the public, so we stretched to allowing them in the room as formal manufacturing contributors: that was their role and no more." (BA)

Chair person's preference is perhaps the most prolific example of how individual qualities can be considered a variable HTA networking element. There are human choices in how to conduct meetings. There is a "grey" area between what is formal and informal according to different appraisal committee decision makers. By speaking directly to the people in the land, particularly in this regard, numerous examples are found of preferential treatment and inscriptive devices of control. An area which highlights the grey area of informality is in the issue of clinical specialists not being in attendance during the closed session of decision meetings. While CA and BA have both corroborated that as many salient areas are covered in the open session as is possible, the fact remains that the clinical specialists are not in the room when the decision is made. There is no guarantee of a diagnostic specialist on the committee.

This was an issue that was addressed in interviews. BA clarified this issue by stating that as many issues are aired in the public session (and are in fact encouraged so by the NICE secretariat). They also commented that the FAD is written over the space of seven days (i.e. not immediately during the meeting) and that there is space for reflection. In the rare instance, BA had no problem phoning the clinical expert for clarification on one or several points. CA commented that on rare occasions, the clinician is asked to stay but that it does not happen often. AA commented that you can get very "useful nuggets" from the clinicians and that it is always worth spending the time to perhaps tease out the valuable things they have to say.

The boundary of this thesis has been clarified as seeking the human element of decision making in HTAs at NICE. The calculative philosophy of this central entity is interpreted through the guides made available publicly. The appraisal guide (NICE, 2013) is seen as the inscriptive device through which NICE controls the black box of HTA decision making from a distance. The experiences of interviewees

are analysed in order to reveal variable HTA network elements that are not described in documents. This section has been about the impact of personal qualities, professional background and individual preference have on how actors have translated their roles, and more specifically, the calculative practices of the committee. What is interesting in AA's commentary is that they see a more useful and dynamic contribution of the human element through paper form involvement as opposed to their physical appearance at committee meetings.

> "I'm not entirely convinced that the patient's perspective is valuable in the lead team presentation. I agree with the idea that its absence represents an imbalance in the voices so I support its being there. It rarely, in my view, presents something that is new or that is difficult to discern from the papers. The patient's voice we get from the papers is interesting. It takes a number of forms and sometimes is just another review, sometimes you can hear and see the same text that other user groups and professional groups and one wonders if it has been prepared by the manufacturers and fed through that organization. But the bits that are really important in that are about the experience of the condition, which are pretty easily picked up by the documents." (AA)

AA further emphasised a dichotomy between the emotive consequences of hearing patient testimony and of remaining impartial in the face of all forms of evidence.

This section has explored the personal qualities and motivations revealed through the perceptions of HTA contributors and decision makers. The effect of diversity in personal choice and motivation for networking in the HTA process has been shown to produce different perspectives on the consistency of calculative practices. This has been shown to be particularly significant from the perspective of decision makers, who have translated higher levels of autonomy in fulfilling their roles as opposed to the contributors.

5.4 – Repertoire of Health Economics as a Networking Element

In this section, evidence is presented which highlights the diversity in HTA accounts which seems related to the repertoire of health economics when it acts a networking element. The variability of the cost/clinical data used in HTA is also linked to institutionally specific models. Appropriate concern is given to the nature of different actor positions for example patient understanding versus clinical expert. The fusion of different network elements is highlighted in some cases, for example increased tenure of HTA experiences allowed a greater technical understanding and highlighted undocumented group power dynamics.

GP was earlier described as a patient representative with little technical understanding of health technology assessment. Combined with their particular rare diagnostic area and lack of tenure at appraisal meetings, they expressed bewilderment at what is considered material evidence, in their role as a contributor.

> "There are Jehovah Witnesses who would not like to take blood products, but that is so rare that we didn't say it. In the NICE report they commented that we had not talked about people who didn't want to take blood products." (GP)

BP was a patient representative for cancer related HTAs. They had a clearly defined boundary for the role of the patient representative. When discussing the different roles and duties of different contributors (in this case the ERG), BP stated that "Well, yes, but we are not involved in that process at all. They do a lot of economic modelling. I'm interested in the cure, not the cost," (BP). This is interpreted as a point unique to this individual as other respondents did not so easily divide costing elements from clinical elements[15].

The fusion of networking elements means that the accounts given by different interviewees are prompted by their own motivations, personal circumstances, clinical

[15] Note the inference of economical modelling as a 'costing' element and 'the cure' as an aspect of BP's contributions to clinical clarity.

backgrounds and contributor roles. Their level of experience in appraisal processes has meant that DP has developed a robust technical understanding. However, EP also has a robust understanding due to their incidental background as a statistician. They did not have strong associations with HTA calculative practices, particularly commenting on the lack of provision for the effect of diseases on wider social stakeholders.

> "Do you know EQ5D? It's the steam by which the people who do the modelling and NICE evaluate. It is completely childish. They don't ask your family, employer or children as to what they think your quality of life is. They just don't know. You can get a guide to it on the internet. Have a look and see what you think. I was more of an irritant than most patients. I do not know that what I said had any impact at all. The thing about this quality of life thing is that in a situation – 1 is normal and 0 is dead. You could get negative scores! I do not know if what I said had an effect...It is all down to money." (EP)

EP also made several references to their belief that the taxpayer was not represented in NICE decision making. They made several allusions to the costs of war as comparisons to the justification for funding expensive drugs. They also commented that the potential for contributions from the saved patient should be considered. Having critiqued the modelling for excluding social considerations, they went on to conclude that "what I think they need to do is to get rid of this simple minded view and have a more human assessment as opposed to what they insist on doing. They should want to know about the value to the person – family, employer et cetera," (EP). A recurring theme amongst interviewees was the bewilderment at not including comparative social costs in HTA calculative practices.

The strength of association that an interviewee has with the institutionalised calculative processes of NICE is shown to vary both in terms of individual preference, experience and technical understanding (i.e. the fusion of network elements). As found in chapter one, the complexity of calculative practice in localised and institutional settings are sometimes reduced in a larger framework, like the centralisation of NICE. The level of technical understanding which interviewees

perceive to have is shown to act as a variable HTA networking element when NICE calculative inscriptions are interpreted being one among many standards in health economics modelling.

EC demonstrated weaker associations with NICE calculative practices. There has been some suggestion in interviews that appraisals are stymied by the rigour of clinical trials and that even then, trial data does not represent real patients. EC was not enrolled with centralised calculative practices and gave a compelling example of how calculative practice had failed to produce a logical outcome.

> "Does NICE actually add anything to what is there in the literature? Apart from some assessment of cost it probably doesn't. Just to give you an example one drug is restricted to a body mass of a certain level. That limitation was made entirely on the basis that if you compare the cost of modern medicines with these new injections then once the person goes beyond the body mass index of 35 kilos per litres squared, then the amount of insulin that they typically are treated with costs more than the new drugs. So the limitation is not being made because they are bettering people who are fatter, or because the evidence from all the pre-licensing trials shows that these people are a good group to treat. It was entirely based on the cost. This then becomes this weird gospel that we use these drugs on people that have this degree of obesity when there is not a legitimate clinical reason to use these drugs on someone who has a BMI of 31. Are we really in the game to make people put on weight so they can use the drugs? It is crazy stuff." (EC)

A similar point regarding a "gospel" benchmarking (and mistaken confidence) in NICE calculative practices was made by BC regarding omissions and subsequent use of incorrect data by PCT's. Those with a wider network of involvement in HTA, are more able to place NICE as only one example of a national decision making entity. Such interviewees hinted at a ranking of ability – AM felt that NICE were the "gold standard" of HTA. These findings can be linked to those of Webster and Hoque (2005) who found that the resistance to new cost accounting systems in an Australian Teaching Hospital was linked to the question of accuracy of costing information.

DP stated their confusion at the need for so many different models, arguing that the use of such a mix could only be more confusing to those who were less experienced than themselves.

> "...they don't just work with one model, depending on who the ERG is, you will be working with Birmingham model or the Liverpool model. The manufacturers all have their own models as well and what I would really love would be to have a situation where we could have one model that everybody works to because it's a bit like how long is a piece of string, you can feed data into different models and come out with different answers – who is right?" (DP)

DP's perspective as a patient expert, although with "prodigious" experience, is perhaps too reductive of the sensitivities in economic modelling, particularly with institutions that have models based on a particular diagnostic strength. DP also commented on the prospective (at the time of interviewing) changes happening with regard to value based pricing. They were firm in their opinion that it would only increase bureaucracy and that it would effectively turn General Practitioners into accountants. DP's frustration with multiple economic models and their negative thoughts regarding the reduction of HTA to monetisation at the local level (GP consortia, turning into "accountants" (DP)) can be linked to Samuel's (2005) findings regarding the "physico-fiscal body" of DRGs. The apparent irrefutability of an economic rationale to the clinical dimension has meant that healthcare players have enrolled a necessity to always appraise clinical data in relation with cost data.

AM, a consultant to smaller manufacturers on the NICE appraisal process, described the nuances of differences in economic modelling between different ERG's and between ERG's and manufacturers involved in the same appraisal. There are consequences to these differences shown in AM's description of how they coordinate the health economics of their contribution to achieve the best possible representation in the HTA process.

> "Firstly it depends on which ERG you get...we are all trying to work towards the same goal, a fairly open dialogue with the company to ensure we get all we need. We were dealing with one of the other

> ERG groups who are very much 'go by the rule book'. There was no communication. They came back with some questions which didn't give us a hint that they were having problems using the model. When it came to the ACD, it was slated. Fair enough: some of the points were about the proper ways of extrapolating, but others were things that could be solved by picking up the phone. That got us off to a really bad start. The model wasn't robust enough, so that added six months onto the process, just because they didn't have good internal communications. It added delays and costs. It was really frustrating. There was a judicial review: arguments about comparators. Massive, long process that in itself was a study of everything that is wrong with the process!" (AM)

The differences in the standards of cost and clinical data (the output of the economic modelling) between different contributor groups is a variable networking element which brings the need for the human judgement in the final appraisal decision. AM gives examples of these differences; robustness and informal flexibility to solve problems. AM's commentary includes the consequences to their experiences in the appraisal process as a result of these differences; frustration, delays, arguments, judicial reviews. Judgement is an often cited phrase in the guidance documents. Links can be made to Moser and Law (2006) and their work on 'qualculability' in healthcare ICT networks. AM's comments are interpreted to mean that a certain degree of informal flexibility aids decision making. Moser and Law (2006) find that "calculation" is distinguished from "judgement" but that even in calculation, the "frame and its boundary-making are variable," (Moser and Law, 2006: pp. 59).

CM also commented on the institutionalised effect of having different ERG teams. They gave their opinion on different ERG team abilities and discussed the nature of the ERG's independence of NICE, when there is internal conflict:

> "You've got the ERGs as well, which are separate entities from NICE, and it's interesting when you get tensions between the two. NICE are in the middle but there is often disagreements between the ERG and NICE, or the manufacturers and the ERG and NICE have to weigh in on that. There are 8 different ERGs, so you do see some shocking stuff and they've had to restart it because the ERG didn't do a good job. AB are one of the best. I think they are the best, is my view. BC are the most technical without a doubt, followed by CD, but that extra

> technical side can lead them to do a bit too much, tying themselves up in knots doing elaborate models, when there just isn't the data for it." (CM). (Names of ERG institutions anonymised – AB, BC, CD used)

CA was an appraisal committee decision maker. Their comments regarding commercial-in-confidence data are interpreted to establish varying levels of technical understanding/strength of association with institutional calculative practices, as a variable networking element. They felt that one of their roles in a chairing capacity was to guide the appraisal sessions so as to cover all of the salient issues with as little commercial confidence in the first session as possible. They also commented on their surprise at what is sometimes considered to be commercially confident material:

> "Well we are sort of bound. It surprises me what the manufacturer's see as commercial in confidence. Sometimes I have seen adverse effects as a commercial in confidence table. Everyone should be aware of the positive and negative effects of the drugs. They are there to provide all of the effects of the technology to everyone concerned." (CA).

Continuing in the vein of costing information, CA commented on the common finding that the answers from the manufacturers are always centred "from the cost effective envelope" (CA), whereas the ERG will have "different or higher" (CA) Figures. CA's surprise at what constitutes confidential information highlights the fusion of different networking elements; the motivation of different actor groups (in this example manufacturers and ERG's), and CA's personal desire for as much openness as possible. The label of commercial in confidence is shown to mean different things.

FC, a practicing GP and clinical specialist within HTA processes, discussed their involvement with NICE as part of a wider network in which they desired to advocate strides forward in their diagnostic area. They discussed other activities they were involved in (as regards being a specialist in the area) which included visiting parliament to give presentations, working with varying governmental departments. They also spoke of the impact that their published material had on the subject area. They felt quite restricted in terms of viable evidence which NICE would consider.

They also commented on the generally positive experience they had with the particular appraisal they attended.

> "What I felt and what we were able to show in our own audit study was that if we could make that investment in the selected patients, you could reduce hospital admissions and out patients appointments and so there were some direct benefits. There had been a lot of economic models constructed which were very complex, very mathematical, came up with various like ICER and QALY ratios. I think that most average doctors, managers and purchasers found it quite difficult to understand. I suppose now, as these are more familiar, people have an instinctive idea and there is a little bit more of a grasp of where we are with that. Ten years ago there wasn't, but my aim in our own simple study was to show that actually there are some easily measurable short terms things. It wasn't a randomised study. You could say there were some methodological weaknesses, but it was more real life observation not clinical trials, which often are not a realistic situation… I even had to go to The House of Commons to address a public meeting showing our results et cetera . That showed what I had done was quite intelligible to average people as opposed to the super specialists…the other bit that I got involved in was that the Department of Health had a Working Group that I got into for a time. They were looking at pump therapy and examples of best practice so we contributed towards that. That is available on the net. There is also a Department of Health Group that is looking at purchasing on a central supplier model. In other words, instead of individual trust or hospitals making local decisions they wanted to move towards a centralised system where there would be one preferred provider or distributor and they would have a national ordering distribution system. I have to say that I am not sure how far that has progressed because I think a lot of permissions felt it was taking away too much choice and professional discretion." (FC)

FC's testimony describes the fusion of various network elements that a human actor experiences in the appraisal process. The wider networking detailed in the example above has allowed FC to place NICE in a wider frame of health care providers. FC's personal opinions and background as a GP are evident in their discussion on the ability of different practitioners to understand highly technical issues. The fusion of network elements displayed shows FC's translation of calculative practice to include a desire to simplify, where possible. FC's wider frame of reference is also evident in their example of the potential for a central supplier model. They feel that localised

discretion (i.e. local resource allocation requirements) is sacrificed in a centralised model. FC described their profession as a "frontline" General Practitioner (GP). FC's lack of enrolment with a centralised framework should be considered in light of this.

FC's testimony is similar to earlier arguments made by EC (also a clinical expert, in the same diagnostic area of Diabetes) regarding the intended outcome of appraisal decisions and the reality of process consequences. FC further clarifies this in a debate on the complexity of cost/clinical data. They had translated their duty as a clinical expert to include addressing issues of accessibility for real patients and further commented on their opinion for clearer contents in clinical studies/assessment. In reference to a study that shows the impact of the technology (that they had attended the appraisal of) that they had co-authored, FC spoke about the rigours of academic assessment in contrast to their original intent of the "simple" study.

> "My aim in our own simple study was to show that actually there are some easily measurable short terms things. It wasn't a randomised study. You could say there were some methodological weaknesses, but it was more real life observation not clinical trials, which often are not a realistic situation...It was accessible, basic stuff so people could see the difference...As they were health economists looking at it from an academic perspective they found failings and had a lot of reservations about it as it was not a randomised or controlled study, but as a backhanded compliment they said it would be a highly quoted study so they were sufficiently interested, but that it wasn't to the academic standards. I did not set out to do an academic study. We were more interested in a non-academic, real life, everyday, pumps and bumps situation. We know that when you do formal research studies the inclusion, exclusion criteria often rule out your common patient. They have too many problems – cannot turn up to appointments et cetera." (FC)

FC's comments are interpreted as typical of the problems faced in maintaining sensitivity in calculative practice between a national entity like NICE and a localised front line specialist like FC. Similar arguments are made in the accounting and healthcare literature: Arnold et al (1994) and multi-accentual healthcare costs; Modell (2001) and the resistance of institutionally specific physicians. FC's engagement with academic practice and their perceived success due to academic

rigour is similar to Scarparo's (2006) findings that when clinicians are part of the management structure engagement of costing data, there is less resistance towards new costing frameworks. There is a distinction made in FC's words between academic boundaries of life and a "real life, everyday bumps and pumps situation" (FC). The very essence of how human decision makers use both academically constructed data and heterogeneous narratives is addressed here. The network elements that vary actor experience of the centralised appraisal process highlight the minutiae of issues to be considered in this health setting. FC's motivations are clear; they acknowledge the institution of academic standards and recognise an inscriptive device in appealing to NICE via their own journal paper. FC's commentary regarding the rigours of academic assessment can also be linked to Degeling and Rock (2010). Both concerned with diabetes, Degeling and Rock (2010) found that "established responses" (Degeling and Rock, 2010: pp. 101) from clinicians could potentially stymie innovation. Inflexibility regarding what constitutes evidence could hinder the potential benefits to the concerned patient population.

The ability to understand any repertoire of health economics should be considered in terms of the institutionally specific models of cost/clinical data. The sensitivities, complexities, nuances, methods and models that can be claimed by different institutions will have been translated by the individuals who have been trained using them. In the context of the DRG literature from Chapter One, a link can be made between the idea of institutional health economics and the contextually different DRG calculative practices for example see Soderstrom et al (2006) and Ernst and Szczesny (2005). The fusion of different network elements can also be shown here with the consideration that different ERG teams can be allocated appraisals by virtue of their expertise in different diagnostic areas. If it were possible to somehow combine modelling techniques, as DP previously suggested, would frameworks lose their multi-accentual nature of localised expertise (localised by diagnostic area) and become reduced into a more comparable repertoire of health economics? This thesis argues that although writers like Kurunmaki (1999, 2004) discuss hybridisation, the contents of the new black boxed health economics standards would be dealing with a very high number of complex diagnostic audiences.

HP was a patient representative for a diagnostic condition concerning blindness/deafness. They had been a contributor to two appraisals. HP recalled that the most recent experience had left them feeling as though they had severely underprepared for the questioning that occurred during the meetings. They were confused at the interpretations of the data, during the meeting. HP established the dynamics between different actor groups, decision making politics and the boundary around actor identities, in their discussion of different data interpretations.

> "It was quite apparent that the committee were taking a view and interpreting the evidence in a completely different way than what we had expected...the health economists, they play a crucial role. At the time, it almost felt like they were trying to prove the manufacturers wrong, because of course with MTA's you have the manufacturer submitting a cost model and you have the ERG doing that and I think that just creates a difficult dynamic...health economists want to show others what mistakes they've made with their models: 'My model's better than yours', 'I didn't get a chance to do a model but your model isn't quite as good as it should be'. What happened at the meeting last week was that the Chair was interpreting the information in a certain way. Suddenly he was quite...he is known to be critical of pharma and quite (not to put too much emphasis on it)...at one point the ERG were saying 'No, the manufacturer is right!' It's very strange. I think the ERG plays a crucial role really because they interpret the data that's given to them by the manufacturer or they produce their own models. One problem with the process is that previously with the MTA, they took a long time and part of that is that the academics who work on the models also want to publish what they are doing and that takes time so that's been criticised and has lengthened the time the appraisal took. The clinicians...they really have to be on top of their game, know exactly what the evidence says, be able to respond quickly to questions and certainly in the first appraisal that I went to, the clinicians struggled a bit because they were confronted with an interpretation of the data that they hadn't prepare for, so they couldn't really respond to that." (HP)

HP identifies the goals of the academics within the process. The motives of different actors are shown to extend beyond the boundary of the appraisal meeting. HP attributes this to be a necessary quality, in the view of academics, for the economic modelling to also be publishable. While acknowledging the critique that has been made regarding the time taken during appraisals, there is also the opposite concern

on the quality of comparators in the public literature. Other interviewees (CE, AM) point out that problems with availability of acceptable data regarding comparators can also lead to delays. Such data is subject to the academic rigours of publishing. The question as to what constitutes evidence is one of the main boundaries for the decision makers. FC made the distinction of "non-academic, real life" (FC) situations, but is strongly motivated from a smaller focus than centralised NICE, and from particular diagnostic network relations. The question of what is evidence is further complicated by HP's observations regarding decision maker politics. The Chair, in HP's example, demonstrated a strong bias towards one interpretation despite both the ERG and the manufacturer stating otherwise.

HP highlighted anecdotal observations of the dynamics between different groups within the appraisal meeting boundary. They stated their surprise at the disinclination of the Chair to engage with the manufacturer, despite the ERG team (whose function is to remain an independent entity which analyses the cost/clinical data of the manufacturer submission) stating that the manufacturer was right. FE was an experienced part of an ERG team. They corroborated the difficult relationship between decision makers and the manufacturers. FE framed this in outlining the history of the manufacturer's appearance at appraisal meetings. The question of what is information is shown to be subject to representational politics.

> "...the addition of the manufacturers to the meetings was a large battle that they won through approaching the minister of the department of health. It was a very high up decision. And NICE has historically struggled with what their relationship is with Pharma. I don't want to say they are two faced but you can sense the tensions; whether they should or shouldn't be there and how they should participate. Part of the argument is that they get to send a submission. Frequently the physicians that are there are really well informed, which almost always means that they have done trials in the area and know the Pharma companies and that's sort of a second bite that Pharma gets." (FE)

FE recognises the difficulties in allocating the contributor presence in data consideration. The networking between physicians and manufacturers (Pharma) is

also relevant. The boundary around the appraisal committee meeting does not stop associations between different groups. The interests of different groups are located in interaction with others: the clinical experts as physicians depend on pharmaceutical companies for the clinical trials; NICE depends on pharmaceutical companies for developments in health technologies; patient conferences can depend on pharmaceutical companies for their funding.

CC, a clinical specialist in the area of diabetes, was more direct in their critique of the appraisal process, although almost from the very beginning of the interview, they had cautioned that they were very outspoken. They commented on the bureaucratic nature of the process, describing it as lengthy. They also critiqued the transparency claims of the HTA process, mainly with regard to the modelling methods used in cost/clinical analyses. They stated that the technologies they had been involved with had too narrow of a scope, which excluded relevant information about clinical practice.

> "Let me just be honest, my one concern about NICE is that although the procedure appears to be entirely objective and it follows due process and is held in public and so on, what is not transparent is the technology used by the expert advisory groups/specialists/the appraisal team in other words. The people that do the economic analysis, because the models that they use are not open to testing and this is the biggest and most important single failure. So, we had a situation not so long ago where the model that was used, in one appraisal, would have made another drug that has been approved by NICE, absurdly too expensive to be approved, and yet they used this model to not approve dose escalation of another drug. The model was patently not fit for purpose...What concerned me about that particular appraisal was most recently when I was involved in, was that it had been set up with such a limited agenda that there was only one possible result it could come up with, because it managed to (by limiting the agenda) exclude virtually everything we have learned about this drug in the last ten years...the actual scope was so narrow that it did not permit use of information which we had gleaned over a ten year period about the drug which was persuasive of using it in a different way and that was an extremely disappointing isn't the word. We tried every form of appeal open to us, every line of appeal. It was blocked. So that's sort of the thing that is really difficult. However the appeal on another appraisal that I was involved in, the feedback that I

> got was that my expert evidence and the evidence of the patients was actually persuasive." (CC)

CC clarified that it was a particular experience of one technology that was the catalyst for this critique, stating that in other appraisals they had been involved in, they felt that their feedback had been influential. CC's frustration at not being able to frame their clinical expertise around what they perceived to be very relevant information is one of the strongest criticisms of the HTA process to come out of the clinical expert interviews. It is similar to BC's experience in which they had discussed the consequences of misrepresentation due to their lack of an invite to submit clinical expertise. Both CC and BC commented that it was one particular appraisal which was the focus of their criticism, and that they had witnessed more robust outcomes in other technology appraisals.

Rigidity as to what is counted as evidence, by NICE, is the subject of consistent critiques from various members of the ERG team. CE, who had limited experience of appearing at appraisal meetings, found that there was too little direction for what qualified as robust evidence. They commented on a particular experience with a cancer technology:

> "it is kind of a catch 22 with cancer drugs because they want you to compare it to ancient drugs and so of course in those cases life expectancy was not good. It was difficult to find data as the studies were not comparable against best supportive care as the drug hasn't been invented yet...you take whatever data you can find and you try to make it as robust as possible. That was criticized, but what else could we possibly have done?" (CE)

In relation to the same HTA, CE qualified their agreement with the manufacturers critique but that NICE's rigidity concerning viable evidence stymied the final output: ''The drug company had said there wasn't enough evidence so they hadn't provided us with a model. They had a point, but we have to do what NICE say. The conclusions of the reports are paltry," (CE).

This section has explored the varying repertoires of health economics held by HTA contributors and decision makers. The effect of different definitions in health economics is shown to influence the consistency of what is classed as acceptable evidence by NICE and contributors/decision makers. A fusion effect of networking elements is demonstrated in different ways for example AM's substantial tenure has given them a perceived flexibility in coordinating evidence, in line with what they know of the health economics repertoires of different ERG institutions. A recurring theme from this networking element's findings is that the adoption of a centralised calculative practice means using a health economics repertoire that is academically rigorous but which does not represent a localised, real patient population.

5.5 – Tenure of HTAs as a Networking Element

In this section, evidence is presented which highlights the diversity in HTA accounts specifically related to the effect of tenure in acting as a representative contributor during the appraisal meeting. The fusion of different network elements is highlighted in some examples, for example the greater the tenure, the greater the strengths of association with the technical repertoire of the HTA process.

DP has been the principal patient expert for an auto-immune condition, for all related technology appraisals at NICE. Their extensive experience of involvement at appraisal meetings has allowed them a keen insight into undocumented dynamics of power management and group interactions. They clarified that they had gotten to know a lot of the people on the committee and that a natural consequence of appearing at so many meetings was that they networked with the clinical experts related to the auto-immune condition. DP qualified their opinion on aspects of calculative practice in relation to the insights described. They clarified that their potential capacity for expressing the fullness of the patient voice was hindered by the inability of the clinical experts to corroborate or expand on some of the less technical points made by the patient exert surrounding impact on quality of life. They made a reference to a particular clinical expert who was allowed to sit and observe the NICE

private sessions. DP was told of the vast difference between the two parts of the appraisal. The clinician was not allowed to say anything and had to sit on his hands because there were obvious mistakes he felt that he could address.

> "The thing that frightens me about this whole process is that you are going out of the room sometimes, leaving them to discuss where this is going next and there is no clinical expertise there at all. So if somebody makes an assumption or makes a comment or a statement that is wrong, there is nobody on that committee to refute. And that I find extraordinary: I just don't think that you should have a great body of people making decisions about a therapeutic area without somebody with expertise in that therapeutic area being in the room but that's what they do." (DP)

DP feels that there is a common sense failing in having no guarantee of a committee having an expert in that diagnostic area during the closed, decision making portion of the meeting. This is further developed in DP's discussion of their tenured experience at appraisal meetings. They describe group dynamics and the treatment of patient evidence by other contributors. DP's experience is portrayed in the networking relationships evident in their anecdotal evidence.

> "You have to be able to stand back if you are NICE and look objectively at the cost effectiveness of that by comparison with enabling somebody much younger to be able to live a life where they are operating and contributing to their family and contributing to society. It's the lack of understanding that sometimes I want to go and bang my head against a wall about. We had a previous chair that was chair of all the committees...I've known this chap too long...because he sat on every (chronic condition) HTA, he began to think of himself as a (chronic condition) specialist and as an expert in (chronic condition). He would come out with things like 'well when it burns out', and it doesn't burn out! Things like that…you would sometimes want to go and smack him because he would come across sometimes as quite arrogant because he knew it all, but actually he didn't (on some things) truly understand what he was talking about. I had one of the country's leading consultants on my team who just looked at him and tore him off a strip because what he had said was rubbish." (DP)

Only by increasing experience as a contributor would DP recognise alleged mis-confidence by the Chair. DP also hints at the use of body language to convey

meaning in a committee setting. They describe their insights from as coming from "prodigious experience" (DP).

AA and BA made similar observations (to each other) about their expectations of other committee members, including lay members. The tenure implied with having a decision making role includes an expectation of other's behaviour, based upon experience. However, AA in particular, has expressed surprise at the behaviour of quiet committee members. Those who they perceived to be very quiet have sometimes said something so pivotal that it proved shocking to them.

BC had served as a clinical expert to an appraisal related to diabetes. BC's experience was different from others in that it served to point out that HTA calculative practices can evolve and that a centralised decision making entity is subject to development and mistakes in hindsight. BC's anecdotal evidence also highlights the fusion of different networking elements; their lack of experience is considered in respect of developmental "mistakes" (they were not invited to earlier appraisals despite being the inventor of the technology in situ). However, BC was quite a positive person and perhaps compared to EP, was more willing to forgive mistakes and point out what they appreciated about HTA calculative practice, an example of how different personal qualities affect the perceptions of calculative practice

> "Now even if insulin pump therapy was invented as I said in the 1970's, it did not have its first NICE assessment until 2003 by which time most western countries in the world were using it as a routine treatment so we were already late in coming through with that first assessment. Now my annoyance was that I had no involvement in the first NICE assessment: they did not ask my opinion even though I am the inventor of the thing. I was not called as an expert and had no input in it at all…they made some recommendations which were a reasonable step forward but they made some surprising omissions as well…one mistake was to try and guess the number of patients that might use this treatment and they guessed that about one percent of Type-1 diabetes patients might use this and primary care trusts mistook that as being a recommendation that not more than one percent of patients should use it in a particular area, so for a long time,

> primary care trusts used that as an excuse to hold the no of patients who had access to insulin pump therapy to less than or no more than one percent or thereabouts." (BC)

BC's lack of experience in NICE meetings is not an indicator of their lack of technical knowledge. Rather, their lack of invitation to the earlier appraisal signifies the development of HTA processes. The presence of other health assessment bodies is hinted at here. Calculative practice is qualified both from the boundary of the entity and in a wider agenda of Western countries. AM also alludes to the issue of benchmarking the calculative practices of different health assessment bodies (for example in the US). Despite the lack of experience not being the fault of BC, the issue remains that their lack of presence had real consequences for patients in different PCT's.

AA is an appraisal decision maker. In the context of discussing tenure as a networking element, AA's translation of their duties and actor identity is framed with reference to their change in perspective from committee member to vice chair. The fusion of different network elements is shown here, with allusions to AA's personal qualities, individual interpretation of technical material and the effects of their previous tenure.

> "I feel an obligation that I need to be familiar with all the material to a degree, and I suspect, more so than my other colleagues. The key bit is to try and pick out what the thing is turning on and to understand the main drivers for the decision and critically appraise the data we are presented with and listen to the other voices that are in it, both clinical and user. I get through them and Figure out what the most important parts are. Sometimes I will talk to the chair and other colleagues on the way through. I get sight of the slides that are going through, so I think what I am doing is trying to predict the likely course of the discussion and deliberation, predict not so as to push it in one way or another, but to understand where the discussion is going to go and the issues that we are going to put to the committee." (AA)

AA has subsumed a duty of "trying to pick what the thing is turning on" (AA). This is taken as being AA's personal interpretation, motivated by tenure and confidence in their ability to appraise according to the institution's criteria. AA suggests that being

the Vice Chair includes a responsibility to be robust in their study of all decision making information available, possibly with a presumption that other committee members will be less so.

The tenure of the appraisal decision makers, in conjunction with their preference and technical background, means that they have firm opinions on the strengths and weaknesses of the appraisal calculative practices. In adding value to the patient evidence, BA discussed the current method used for evaluating the quality of life, the EQ5D. They stated that the measure is imperfect and does not capture important aspects of daily living: cognition, hearing and seeing.

> "Another example of where the patient evidence can be important – so that first example was an extreme group who you wouldn't see from just looking at the trial evidence. Another might be that the quality of life measures have failed to pick out some thing that matters. This is now almost in the academic domain, but partly prompted by NICE meetings and similar so we use this quality of life measure called the EQ5D, but it hasn't got everything in it and one of the things it hasn't got is cognition. In other words if there's some drug or some disease that, for want of a better word, makes you less acute: that won't be captured by the EQ5D. And indeed, special senses aren't in the EQ5D - hearing and vision - but that's so obvious that no one would have used the EQ5D without some sort of special thing for sight and hearing in the first place." (BA)

BA was not overly critical of the measure, simply stating that there are deficiencies. BA's enrolment with NICE's institutional standards of evidence is seen in the "obvious" qualities of the EQ5D. BA's belief in their ability to act as a spokesperson is also clear in the confidence they have in coordinating evidence: to be as robust as possible, BA finds patient evidence important in order to balance deficiencies in more technical measures.

When questioned about the proposed developments regarding value based pricing, BA was receptive to the idea of incorporating social costs into their current metric but wanted to make it clear that it would be a difficult task. They also questioned the

politicisation of what they perceived to be very incomplete ideas regarding how to go about it.

> "The social costs are an entirely plausible addition to our current metric but not if you then deliberately don't take into account the social costs of the technology you displace by using up the money. Every-time we do an appraisal, someone will say – 'but there is also the social costs' and the idea is then we would say yes. But we wouldn't because the comparator and all the other things would also have to be recalculated. In the current whitepaper, it reads as though it's only intending to do the calculation for one half of the balance. And that's outrageous but it looks like that. It looks as though it's been a knee jerk response to industry lobbying and the same goes for argument about innovation. The last thing you want to do with innovation is have it paid for upfront by a 1/50 of the world market when everybody else gets a free ride – lots and lots of reasons why. All of the extra criteria is seen to be ill thought through but I do know (informally) that the civil servants seem to think it's been ill thought through as well. But politicians will often respond to lobbying and that's just the world we live and it's all down to democracy being a terrible system except for all the others, which are worse." (BA)

BA made distinct reference to the difficulties that might occur in incorporating such new metrics to their decision making bases but stressed that it was personal conjecture. CA also commented on the difficulties of incorporating heterogeneous cases in comparison purposes; "Do you count in the cost of person X in Job Y, not being able to do the job compared to someone else, who may not have the same skill set and how do you value that? There are lots of examples where it can be tricky to incorporate all the different costs." (CA)

Both BA and AA are appraisal committee decision makers. They have both commented on their difficulty in perceiving the potential benefit of having manufacturers and patient representatives contribute during appraisal meetings. While they arguably have a wide frame of reference in what CM described as the "small world" of health economics, their comments reveal a strong confidence in their ability to mediate all forms of evidence. Chapman et al (2014), in the context of good DRG practice, suggest that this includes equitable contribution from a variety of healthcare players. A point for discussion is the ability of the appraisal decision

makers to act as spokespeople for this contextually technical process. Chair person's preference, in particular is considered in the next chapter.

AM had previously been a manufacturing representative at many NICE appraisals. They had turned their tenured experience into a consulting role, advising smaller companies on their first submissions to NICE. They described the informal processual elements which would only have been revealed by talking to the people in the land.

> "We are very much on the side of the companies. My role in particular is to help companies in the communication. Our job as a company is to prepare them, the economics side of it. To ensure that the company best represents the data that they have, to best demonstrate the value of the drug for what the government may pay for it. My role is slightly different from the rest of the company in that I train up companies in terms of the meeting itself. Now they have company reps in meetings, I help the clients with their role on the day and also in their communications with NICE. Although there is a formal process, there are other communications that go on as well. How you handle those can make a big difference: it can be the difference between taking on some late evidence, or something that you want to get into a meeting. If you don't have the communication, it doesn't happen. On the day itself, how you act and respond to questions can have a massive impact on the decision they make. Someone who has prepared and who answers academically can get drawn into the meetings and they get included. I've been to meetings where the rep was treated as a committee member because they came across well and knowledgably. They are saying things that aren't just marketing messages. New knowledge and clarification are seen positively. They are adding value to a complex process, whereas you see others who don't really know and aren't prepared. They are spurting out marketing messages and it just pisses the committee off. When that happens they are either not asked questions or everything they say is viewed negatively or suspiciously. You then don't get a chance to drive the discussion. The politics and understanding the flow of a committee meeting is important. A lot of the companies don't know that, they don't know the means or what their role is." (AM)

In clarifying the role they bring as consultants, AM detailed a catalogue of undocumented observances that could influence the impact that the manufacturer

contribution; the way to behave, the methods of directing attention, appraisal etiquette. AM's description of their role and the emphasis on the other set of communications highlights the human variability examined in this case study. Only by going back to the people in the land could it be revealed that because of AM's tenure, they can advise future submissions.

BM also made reference to the consulting role and argued that the size of the manufacturer is an important factor. They clarified that large pharmaceutical companies had inherent institutional knowledge in how to play the game whereas the smaller companies needed their guidance as consultants on the appropriate things to include for a submission. The undocumented observances are examples of AM's attempts to extend the triangle of interessement, now that they are no longer personally tied to the OPP. Their motivation, another example of multiple networking elements coming together, is to make a career of helping pharmaceutical companies maximise their impact within NICE contributor rules, based on their insider knowledge.

This section has explored the effect that HTA tenure has on perceptions of calculative practice from contributors and decision makers. Increased tenure of appraisal meeting etiquette allows some actors to tailor their contribution. DP had strengthened relations with the clinical expert to ensure that misplaced confidence of clinical understanding by decision makers would not adversely affect their relevant patient population. AM had a detailed set of on-the-day rules to maximise the representative opportunities allocated to the manufacturer. Increased tenure also meant that some actors critically placed NICE calculative practices within a wider frame of reference. BA acknowledged the limitations of the EQ5D and challenged the politicisation of value based pricing calculative practices.

5.6 – Inter-Contributor Dynamics as a Networking Element

In this section, evidence is presented which highlights the diversity in HTA accounts specifically related to the effect of a) having synergistic relationships with other contributors and b) having previous experience in (some form) of health technology assessment or advocacy. This is different from the effect that incidental professional background has on the HTA experience (for example EP being a statistician). The fusion of different networking elements will be apparent in this section. The tenure of actor experience in more general health economics means that, depending on motivated role, some actors exploit their knowledge of networking relationships, for example AM's consultancy role (from tenured experience of being a manufacturing representative) in advising new companies to get the right patient voice, befriend clinicians et cetera. The extension of network involvement beyond the appraisal committee boundary is highlighted, giving examples of contributor dynamics and more general HTA experience as evidence to justify actor environment and roles.

EC earlier described their work in establishing a simpler audit study that could be more easily understood, in the context of institutionally variable ICER's and QALY's. They described their journey to the House of Commons and their wider work with Department of Health working groups. EC is demonstrating a translated view of the appraisal committee which is justified in an extension of their networking activities. The general indispensability of NICE and the more specific infallibility of centralised calculative practices are shown to be problematised in respect of EC's wider health economics activities. EC further clarified this perspective by describing the complicated consequences of contributing to NICE as if it were indispensable. EC describes a NICE "reality" (EC) and also places it in a wider context of the NHS. The motivations of different actor groups are highlighted. The black box of the HTA decision, controlled by NICE, incorporates complex goals.

> "I think, certainly one thing that is interesting, is that for people like myself and Diabetes UK experts, for us to be involved in clinical trials means, we are interacting with the pharmaceutical industry...so you feel that you are making positive comments about the drug then that is

> perceived to have a very pharma influenced argument to it. And the members of the committee were at great stall at declaring no conflicts of interest at the beginning. But the idea that none of these people have any interest is a bit far-fetched. And if they have no contact with Pharma then their interest will be guarding against pharma. Well the way we are at the moment is we feel that pharma is bad and no engagement with them at the moment is good. I think reality is somewhere in between. For example, for clinicians if you are heavily involved in NICE work and other work of that kind with no pharma involvement then your likelihood to get merit awards is much higher! In theory you can end up with a higher reward for sticking to this very purist line and that is money and it is significant money. There is a sort of hierarchy of purity out there that doesn't quite reflect real life." (EC)

EC describes the unrealistic agenda of maintaining little to no networking with the manufacturers. The contributor role of the clinical specialist is faced with a double edged sword here. The reality of maintaining (EC's perceived) NICE's ethos of limiting engagement between manufacturers and other actor groups comes with "purist" (EC) benefits of merit and potential funding. There is a link to be made between this point and Purdy and Gago's (2009) findings regarding the "field restricted production" (Purdy and Gago, 2009: pp. 68) of medical practitioners: the benefits of maintaining the purist philosophy are greatly appreciated, similar to the Galician medical practitioners who appreciated their autonomy in the old management framework. Other interviewees, in describing NICE within a wider network of general HTA, reveal the benefits of engaging with pharmaceutical companies. Others highlight the falsity of a no-involvement agenda. EC's example of this no-engagement philosophy is interpreted as an inscriptive device which locks actor roles into place. Depending on the motivations of the contributor, the NICE controlled black box (and thus NICE processes) will be the only way to achieve various goals.

Included within this chapter have been opinions from appraisal decision makers that hint at a hierarchy of contributor importance, with manufacturers given less leeway in communication opportunities (during decision meetings) than other contributors.

The existence of a NICE reality has been a consistent theme, with interviewees stating that the centralised calculative practices of the appraisal committee are at odds with other controversies. Some conceptualise this as common sense for example EC's evidence regarding obesity. Links can be made between the point regarding the reality perpetuated by NICE (as the centralised controller of the black box) and Chua's (1995) findings regarding the falsity of claiming success in the centralised nature of DRG calculative practices. Chua found that resource allocation decisions had to allow for contextual costing elements, for example the costing realities were different by country: "The Group accepted that such an assumption of identical relative resource consumption might not be valid since differing treatment protocols could exist between the two countries." (Chua, 1995: pp. 133).

The appearance of the manufacturer at appraisal meetings has been a contentious issue for NICE. A general ANT principle is to follow actors along a network (to whatever length required) to understand how they justify their environment. The boundary of the NICE appraisal committee meetings, while a pragmatic necessity for this case study, does not mean that evidence from actors is always about experiences of acting as the physical representative in the appraisal room. The extension of the network described by interviewees, in justifying their environment/role/duties/opinions, reveals a wider healthcare network. Associations with this network are transported into the appraisal room. DM demonstrates this in justifying the importance of manufacturers by extending the NICE boundary to the context of a non-free health service.

> "The bottom line is that without industry NICE wouldn't exist. It is the job of industry to spend billions of money on research that you hope will meet need. Outside of the U.S. there are very few countries that can do the RandD that we do. To be self-sustaining we have to charge for those drugs. The other thing is that the NHS is a bit of a dichotomy from the rest of the world. People are used to the fact that they pay for elements of their health system. I think we've gotten a bit soft in the U.K about it. But then somehow people see it as it being wrong that drug companies charge for medicines to the NHS. The NHS is free, so how dare they charge that for medicine to the NHS. It's fair to criticize how much drug companies make out of the NHS,

> but that's a different argument. The average cost of NHS list price medicines is cheaper than anywhere else in Europe. They get the best value for money." (DM)

DM has extended their network involvement to an international level. The importance of the manufacturer contribution to NICE (and patient access) is contrasted with the conditions for pharmaceutical company survival, in monetary terms. The hierarchy of communicative importance at appraisal meetings is judged, by DM, with a bigger frame of reference. DM brings international comparisons into the appraisal room. DM's commentary also highlights the variances of costing in international Research and Development (hereafter RandD). Different market definitions, for example free UK healthcare via the NHS and private healthcare in the US, if transported into the appraisal room, must contend with potentially different definitions of profit as found by Newhouse (1989) and Mogyorosy and Smith (2005).

The extension of the network means that diverse and institutional controversies are transported into the appraisal room. The purpose of the centralised calculative practices is to mediate multiple concerns, within a single budget, and to satisfy a communicative accountability to the national public. Callon (1986b) describes how the Scallops have been "transported into the conference room through a series of transformations" (Callon, 1986b: pp. 14). CM highlights the variability of diagnostic controversies but that there is power in the inscriptive devices of those involved (in the controversy) beyond the boundary of the appraisal committee.

> "Cancer drugs are highly political. If they say no it will go into the Daily Mail. They have a public profile that makes them more interesting for certain people, whilst other diseases like Juvenile Schizophrenia do not have the public profile of Cancer. Schizophrenia is a highly crippling disease to the people involved and a medically interesting disease. We met with NICE beforehand and knew we would end up borderline cost effective if at all, but there is a high need for these patients in their small population, but it probably costs more to conduct the appraisal than what the NHS would pay for the drug. NICE said it sounds good, but you will need to speak with the department of health. One person was (anonymous), he/she sits in the department of health based in (anonymous) and was responsible for the department of drugs after NICE. He/she said the department is

> under political pressure from the public to get NICE to issue guidance for treatment. We got a positive in the end after we put in some more work...Health Economics is a small world: when it comes down to working with NICE it's an even smaller world. But this makes it more interesting because people know each other and that's good." (CM) – names blanked out for anonymity.

CM highlights the small networking world of appraisal decision makers and of those that create the health economics evidence. CM's "small world of health economics" (CM) is equated with intermediaries, which represent silenced patient populations (Callon, 1986b). CM interprets the strength of diagnostic voices and uses NICE's calculative practices to maximise the impact of their consulting role (CM works with AM).

AM has already been described in terms of tenure as a consultant to small companies on their initial NICE manufacturing HTA submissions. The catalogue of undocumented processual observances described earlier, also reflect more nuanced relationships between contributors. AM is particularly emphatic on the benefits of establishing networking relationships outside of the appraisal room, between the manufacturer and the clinician.

> "The patient group is kind of important, but the most important thing is get the clinicians on your side. There is that relationship between clinicians and companies; they have a dialogue with them. If you get the chance to speak with them before the meeting, take them through what we are trying to get at. Often the committee (that includes lay members) will be relying on the clinicians to back up what the company is saying. I can perceive clinicians with a degree of independence but they are the most important link between the company and committee. They can ask questions of the companies and are included in the discussion and that relationship is really important. An early example I remember included the fact that they had completely the wrong clinicians – ill suited to the drug at hand. The comparators for the drug are terrible, really bad, but because the clinicians chosen were not experts in the drug under appraisal, there were complexities that went by without clarification from us as we can only answer questions. We made sure to get the best clinicians in the next meeting. He gave a brilliantly eloquently discussion on how bad the current drugs were and it completely turned the day around. Nothing really changed, we just had a clinician supporting it – really

> saying there was a need for it. That for me, is the most important link in the whole thing...In terms of the tipping point, sometimes there is something that is so obviously a yes or no – fine. Easy decisions exist. But most of them are border-line. In those cases, the clinicians drive the discussion." (AM)

AM's evidence is interpreted as an example of synergistic contributor dynamics, which are out with the control of the controlling entity. Diverse networking relationships are shown to be an element of the HTA experience which causes divergent translations of calculative practice. The strength of the inscriptive devices is tested in AM's evidence. AM's tenured insider knowledge has affected the impact of the clinical expert contribution. AM's practice of engaging with clinicians can be linked to Kurunmaki's (2004) work regarding hybridisation. If clinicians engage with the manufacturer instead of presuming the appraisal dynamics to include a battle, then variances in data used in decision making could escape "abstract knowledge claims and dominating professional presence" (Kurunmaki, 2004: pp. 336).

This section explored the ways in which contributor dynamics and relationships impacted the perceptions of HTA calculative practices. The boundary of the HTA process is often extended in actor accounts, placing NICE's centralised HTA decision making within a wider frame of reference, diminishing the perceptions of indispensability or irrefutability of NICE's processes. The black box of NICE's methods perpetuate a reality, which has been shown to be contested by actors who have extended network involvement due to either deeper contributor relationships or experiences of advocating in health technology assessment. Consider EC, who was involved in multiple government activities and academic pursuits in relation to their field. They continually referenced a difference between the academic rigour of the reality which NICE perpetuates and the reality that they have seen as a front line physician. This reflects the core accounting issue of representing scale within a boundary; NICE is a central entity and EC challenges their calculative practice based on their localised expertise.

5.7 – Answering Research Question One - What network elements are revealed in speaking directly with HTA contributors and decision makers?

To answer the first research question, I refer back to section 3.3.5 and show that the thematic differences in the two stage coding analysis revealed five areas of difference between the NICE appraisal guides – the action-at-a-distance inscriptive devices used to lock allies into place. These differences amounted to elements of networking in HTA. These network elements were diagnostic area, personality/background/motivation, health economics repertoire, HTA tenure and contributor dynamics.

Sections 4.3 – 4.7 presented the findings from the HTA field work at NICE. Section 3.3.5 detailed the two stage manual coding process for analysing the interview findings. Like McNamara et al (2004), the interview findings were the main source of evidence for answering the research questions. The use of interviews, as a research method, is useful in allowing actors to speak for themselves, a core principle of Callon's (1986b) model. However, other research methods including contextual reading and observations were important in framing potentially material issues, similar to the actions of boundary objects for example the contextual reading of the NICE appraisal guides (NICE, 2009, 2013) and HTA meeting observations were essential in directing the focus of which actors to follow.

I followed the actors as they defined their environment within the boundary of being a representative at HTA meetings. What they revealed about their experiences as HTA contributors and decision makers were the direct accounts of the HTA process. The inscriptive devices used to control essential actors, from a distance, (the definitions and due process found within appraisal guides primarily) were being traced back from the nth level to the people in the land (Latour, 1987). Differences between the inscription devices and the direct interviewee accounts highlighted five ways in which HTA networking was more detailed/differed than in the action-at-a-distance black-boxed account by NICE, in documents like the appraisal guides. These included diagnostic area, personality/background/motivation, health

economics repertoire, HTA tenure and contributor dynamics. Latour (1987) described such differences in his discussion of how calculation.

> "Inside the centres, logistics requires the fast mobilisation of the largest number of elements and their greatest possible fusion...the risk of the cascade...is of ending up with a few manageable but meaningless numbers, insufficient at any rate in case of controversy since, the centres would end up with a net loss. The ideal would be to retain as many elements as possible and still be able to manage them..." (Latour, 1987: p. 237)

By speaking directly with HTA contributors and decision makers, instead of taking the inscriptive power of the NICE appraisal guides as fact, the people in the land are accounting for their own topologies of the social (Latour, 1999). In controlling the black box, NICE must control calculative practice with enough associative interest to lock allies into place via the inscriptive devices. In speaking with contributors and decision makers directly, I was able to see what elements were not retained. The answer to research question one then, is the five elements which revealed in speaking to these people of the HTA land: diagnostic area, personality/background/motivation, health economic repertoire, HTA tenure and contributor dynamics.

5.8 - Chapter Summary

The first research question in the NICE case study is "what network elements are revealed in speaking directly with HTA contributors and decision makers?" Taking the appraisal guidance documents (NICE, 2013) as the final, "nth" level inscription (Latour, 1987: pp. 234), I sought to explore if there would be added insight regarding the controversies surrounding the reference case and judgement criteria described. In speaking with the contributors and decision makers, I was going back to the "people in the land" (Latour, 1987: pp. 234). I could hear the non-transformed accounts of those essential to contributing the evidence used to reach HTA decisions. The complexities of cost and clinical data would be better understood.

In answering the first research question, I found that there were five key network elements experienced by contributors and decision makers, which influenced the variability of actor translations of the NICE black box. These network elements were structured as follows; diagnostic area, personality/motivation, repertoire of health economics, tenure of HTA experience and contributor dynamics. Evidence from observations at appraisal meetings and actor interviewees was thematically structured around these network elements. The fusion of different network elements was routinely highlighted.

I justified the boundary of the actor-network to include those contributors and decision makers who appeared at appraisal meetings as physical representatives. The particularities of the NICE social context was overviewed, but only to the extent that these details were material to actor identity. The HTA process was outlined, including the repertoire of terminology used by actors. Actor accounts of the HTA process were presented according to the five networking elements.

HTA diagnostic areas were shown to strongly affect the actor's translations of NICE calculative practices. Associations with particular medical areas included the contrast between chronic and of life conditions and with rare and prolific conditions. Personal qualities and motivations for appearing as contributors/decision makers were shown to affect the ways in which actors fulfilled their duties. Levels of personal autonomy in considering what is evidence, were found to be greater with decision makers than with contributors. Negative views of NICE calculative practices were shown to stymie the representative duties of some contributors. The repertoire of health economics was shown to vary widely along the network. The consistency of NICE calculative practices was challenged in the context of discussing; the institutional effect of health economics knowledge (for example different ERG specialities), the difficulties of defining comparators and of academic standards in general, the difference between the reality which NICE perpetuates and that advocated by localised contributors. The tenure of an actor's HTA experience influenced their perceptions on NICE's irrefutability. The longer an actor had been involved with NICE, the greater their inside knowledge of informal processual etiquette. This was

shown multiple times to work to the advantage of some actors in maximising the representative opportunities they had as contributors. The relationships between different actor groups was explored, uncovering contributor dynamics which affect actor perceptions of NICE calculative practices. The relationship between contributors and the manufacturer (and pharmaceutical companies in general) is shown to be more complex than is described by some decision makers. The extent of an actor's wider activities in healthcare meant that they extended their network boundary accordingly in justifying their perceptions of NICE calculative practice. Throughout actor accounts of the HTA process, the network elements identified were shown in a fusion. These elements of networking did not singularly affect actor experiences.

In the next chapter, I will extend the analysis of the key findings presented in this chapter. The fusion of networking elements described is used to frame the four moments of Callon's (1986b) model of translation, in answering the second research question of "What do these network elements reveal about HTA calculative practices at NICE?"

CHAPTER SIX
DISCUSSION: A TRANSLATION OF THE HTA PROCESS AT NICE

6.1 – Chapter Introduction

Drawing upon the theoretical framework, discusses the analysis of the evidence from Chapter Four. I presented the constituting elements of the theoretical framework throughout Chapter's Two to Four. The accounting and healthcare issues from Chapter Two revealed the contextual particulars to consider when implementing/observing accounting practices within healthcare, with emphasis placed on the complexity of healthcare boundary. Chapter Three framed these issues, with the theory of ANT. Callon's (1986b) Sociology of Translation (see section 3.3) and Latour (1987, 2005) were chosen as the original ANT theorists to utilise in framework building, with their joint fit being justified by the pragmatic road-mapping offered by Callon (1986b) and the complementary principles of Latour (1987, 2005) to Callon's (1986b) framework. Like Law's (1999) "multi-national monster" (Law, 1999: p. 2), disciplinary specific reviews of ANT studies revealed points of origin particular to different disciplines. The use of ANT by accounting/healthcare researchers revealed contextual clarification of network observations that I applied to the HTA case study, for example justifying the timing of observing in-action networks.

In this Chapter, this theoretical framework is used to answer the second research question - what do these network elements reveal about HTA calculative practices at NICE? To answer the second research question, the sociology of translation model is applied to these network element findings. Four stages of translation including problematisation, interessement, enrolment and mobilisation are captured from these findings, to discover what the networking elements reveal about calculative practice. Extensions of the actor-network are described in relation with actors who do not agree with NICE due process. Justification of actor identity, environment and duties are established in these network extensions. A “small world” (CM) of health

economics is discussed in relation with the ability of centralised entities to act as spokespeople.

6.2 – A Sociology of Translation

This section will capture actor translations of the HTA network within Callon's (1986b) Sociology of Translation (see section 3.3). Chapter five presented evidence which showed HTA network elements that challenged the consistency of centrally defined calculative practices. These were revealed in speaking directly with contributors and decision makers. Contributor and decision maker motivations for being in the HTA network are shown in Figure 15. Figure 15 shows the construction of the network at NICE. After introducing the ANT conceptual framework, I described the methodological process of following the actors, showing the actors associated with the HTA controversy in Figure 13. Figure 13 showed the actor groups associated with the controversy, which was an adaptation of Callon's (1986b: p. 20) Figure 1 showing actors associated with the controversy at St Brieuc Bay. In Figure 15, I am showing a development of Figure 13 from highlighting material actor identities to establishing their goals and the challenges they face in passing through the OPP. The evidence presented in chapter five, reveals what the goals of the entities were. The networking elements revealed by speaking directly with contributors shows what it is that challenges their passage through the OPP. The obstacles and problems faced by entities in Figure 15 are heterogeneous experiences of individual healthcare players who are participating in a system which is both centrally managed and must use subjective judgement due to localised healthcare complexity. Figure 15 highlights recurrent contextual tensions within healthcare, predominantly the need to balance finite healthcare resources with meeting a patient's right to equal healthcare benefits.

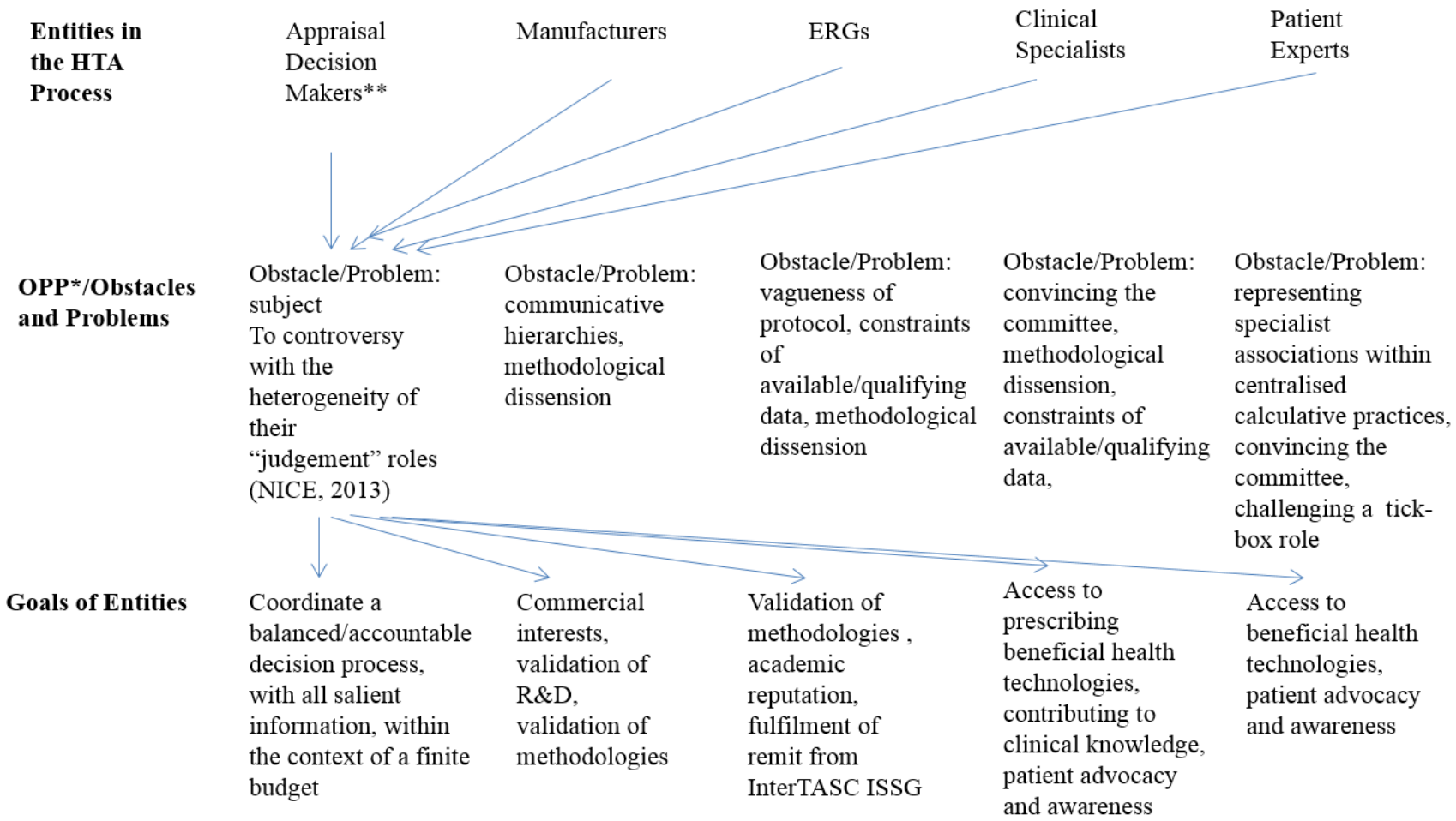
By presenting the construction of the network at NICE, I will now show the degree to which actor interests were translated. The mediation of central calculative practices and subjective judgements for localised healthcare complexity is at the centre of the purpose for this translation analysis. The four stages of Callon's

(1986b) model, which include; problematisation, interessement, enrolment and mobilisation, are set out below. The translation of actors' perceptions of the HTA network is captured in these four stages. This analysis will answer the second research question: what do these network elements reveal about HTA calculative practices at NICE?

6.2.1 – Problematisation

Problematisation involves the identification of other people's interests. In abiding by the three principles of Callon's (1986b) method (agnosticism, generalised symmetry and free association), this thesis follows the HTA contributors through their

Figure 15 - Showing the construction of the HTA network at NICE



*Obligatory Passage Point (OPP) = approval decision by the appraisal committee

*The introduction clarified the independence of the appraisal committee from NICE and that their role can include non-reference case analyses if considered appropriate by decision makers. For the purposes of showing the controlling actor within Callon's (1986b: p. 20) diagram, I am showing the appraisal committee in the capacity of the focal entity as they represent NICE's interests and are guided by NICE calculative practices.

interpretation of the HTA network. A priori assumptions are left behind, and no single actor group is preferred over another. The identification of other people's interests, then, is a strange thing. I am independent of the scientific arguments of the context, I am independent of the institutional repertoires of the contextual language (in this case, health economics) and I discard a priori assumptions about actor interests. Rather, the fusion of revealed network elements, represent the minutiae of features required (by diverse actors interviewed) in this calculative centre (Latour, 1987). The importance of the HTA process is of decision makers appraising technologies that, at the bottom line, aid an entire nation of human health.

The problematisation of the interviewed actors is considered in how indispensable they feel the NICE HTA process to be in the achievement of their goals. The variance in actor problematisation is directly linked to the network elements of diagnostic area, personality/motivation, repertoire of health economics, tenure of HTA's and contributor dynamics. A fusion of these different network elements come together in this consideration of how dispensable this version of HTA calculations are. Not all of the points made in the previous chapter will be revisited, rather the aim here is to demonstrate a robust defence of the claim that the variable HTA networking elements revealed directly by human contributors influence actor translations (at each stage) of calculative practice.

The motivation for appearing at appraisal meetings and the completeness of goal achievement that the NICE OPP provides are particularly prominent network elements which impact actor problematisation. EP's personal qualities, background and motivation influenced a disagreement with the indispensability of the NICE OPP, at least in the fulfilment of their goals. EP felt that they understood the repertoire of calculative practices by virtue of their background as a statistician. They had contributed as a patient representative but felt that they were "lucky" (EP) in that their access to the relevant medical technology was assured irrespective of the appraisal committee decision. EP had not problematised an indispensable view of this particular controversy.

EP's personal qualities and background have impacted their problematisation of NICE's interpretation of health economics based decision making. In this same way, EC, compared to EP, felt positive about NICE processes, although the difference in their motivation is the EP was a patient whose life would be directly impacted by the decision whereas EC was a clinical expert with a particular medical device. EC had problematised a close approximation of the actor identity and duties as prescribed in the inscriptive guidance documents. They commented on seeing the evolution of NICE calculative practices in-action from an earlier appraisal where they were a) not invited, despite being the inventor of the device and b) errors made by the PCT's as a result of omissions made by NICE.

The timing of network observations, relevant to contextual politics, was discussed in chapter two (see section 2.7). It is important in terms of witnessing the in-action controversy that the viewer wishes to understand: Christensen and Skaerbaek (2007) found that lengthening the time of the study lead to a reduction in "obfuscation" (Christensen and Skaebaek, 2007: p. 127); Lodh and Gaffikin (2003) argued that a longitudinal approach demonstrates the incrementally continuous translation process required to both implement and maintain new frameworks; Papadopolous (2011) found similar results regarding the likelihood of actors enrolled with the new Continuous Improvement (CI) framework. EC extended their network involvement by establishing the use of their medical device as "standard" among most "western countries" (EC). I interpret EC's positive attitude, in-action observations and network extensions to mean that they have problematised NICE's indispensability as a match with the "behind the times" (EC) state of diagnostic elements in the UK.

BA, a tenured appraisal decision maker, had problematised the indispensability of NICE with deference to confidence in their ability to act as a spokesperson. They referred particularly to Chair person's preference as an aspect of heterogeneous coordination of the appraisal decision meeting. BA's views on what constitutes evidence, is reflected in the prioritisation of communicative opportunities given to different actor groups for example preferring to give patient experts the extra opportunity to speak at appraisal meetings over the manufacturing representatives.

There is a notable difference between the controversy that has been problematised by the non-human voice (in the form of the guidance documents – these are inscriptive devices which allow NICE to control at a distance) and two of the appraisal decision makers, BA and AA. It is worth repeating again that NICE and the appraisal committee are separate entities; the appraisal committee informs NICE of their decision. Callon (1986b) clarifies the complexity of becoming indispensable to a number of interested actors:

> "Each entity enlisted by the problematisation can submit to being integrated into the initial plan, or inversely, refuse the transaction by defining its identity, its goals, projects, orientations, motivations, or interests in another manner. In fact the situation is never so clear cut." (Callon, 1986b: p 8).

The heterogeneity in chair-person's preference mirrors Callon's (1986) refusal to believe that problematisation is clear cut. BA and AA both revealed differences of opinion that are sometimes actively reflected in the coordination of appraisal committee decision meetings. BA prioritises patients and clinical experts over manufacturers as regards leeway in communicative opportunities (broadly interpreted as a form of evidence). AA does not believe that the physical presence of patients is of added value, instead feeling that the most interesting contribution from patients comes from the written submissions. AA does extend patient presence as necessary to avoid an imbalance in the voices (AA) but finds that there has never been a situation where anything new or interesting has been contributed by their physical representative. I interpret AA's testimony as a reflection of NICE controversy elements which do not succeed as inscriptive devices or engage in actors with an indispensable view of NICE. A recurring theme that was established in the previous chapter was that there is an institutional reality and subsequent calculative practices which reflect this.

6.2.2 – Interessement

This section expands the problematised entities, their motivations and the how much the NICE controlled OPP is indispensable to their goals (for ANT interessement see section 2.3.3). Callon (1986b) justifies the etymology of the term interessement: "Why talk of interessement? The etymology of this word justifies its choice. To be interested is to be in between (inter-esse), to be interposed. But between what?" (Callon, 1986b: p. 8). To interest others is to begin the engagement of convincing them (enrolling them). A controller (A) imposing a particular assemblage of resources and relations (a controversy) upon another (B), whom the controller has deemed necessary, will seek to define their role. When A interests B, they seek to cut off other controlling interests in B and B's interest in everything else (C). A interests B by building devices which cut off and weaken associations with C. Callon (1986b) describes this as the triangle of interessement.

The centralised nature of NICE means that it relies on its assemblage of inscriptive devices to convince a diagnostically heterogeneous national population. The qualities of these inscriptive devices must represent enough of the interests of A, B, C et cetera but also must be manageable for the public service nature of this entity. Latour's (1987) discussion on the centres of calculation and his 7th rule of the method are used to clarify the contribution made by studying the variable HTA network elements. Latour (1987) discussed the challenge of representing multiple interests from a distance and the retained elements that are required to attach the necessary actors (see section 5.2). Latour's (1987) seventh rule of the method states that

> "before attributing any special quality to the mind or to the method of people, let us examine first the many ways through which inscriptions are gathered, combined, tied together and sent back. Only if there is something unexplained once the networks have been studied shall we start to speak of cognitive factors." (Latour, 1987: p. 258).

The issue of retaining elements, from a distance, to attach multiple actors (and their multiple interests) provides the contextual challenge of what was unexplained from the inscriptive accounts of the HTA process, which NICE uses to control the black

box from a distance. The successful interessement of actors will result in their enrolment with the controller's controversy.

AM's motivation for passing through the OPP changed over the course of their career. They had been a tenured manufacturing representative, with prodigious experience of appraisal meeting dynamics. They had turned this into a consultancy career, advising smaller pharmaceutical companies on the best ways to appeal to the committee during their first appraisal experience. AM was still motivated to pass through the OPP as they would depend upon their reputation of aiding smaller pharmaceuticals through appraisals to foster a commercially successful career. AM is one of the best examples of highlighting the knowledge gained from going back to the "people in the land" (Latour, 1987: p. 234). Their tenure (as a variable networking element) meant that they could advise manufacturing representatives about appraisal meeting dynamics. Whereas BA would coordinate appraisals with a hierarchy of communication dynamics ("discretion" (NICE, 2013: p. 62) is an example of interessement and a calculative practice), AM would highlight the catalogue of behaviours and practices which could potentially alter this dynamic. AM's behaviours included creating positive dialogue/rapport with the other contributors, particularly the clinicians.

AM's problematisation is shown to be impacted by their commercial motivations for contributing to HTAs. Other manufacturing representatives acknowledge the commercial aspect of their motivation, although often in a network extension of justifying their environment in expensive pharma research and development. DM, a manufacturing representative, once utilised extraordinary body language to counter the interessement devices (for example Chair person's coordination of communicative opportunities) used to define their role and contributor duties.

I interpret AM's catalogue of coordinating behaviours as the employment of their own set of interessement devices. Inter-contributor dynamics are actively defined, a perspective of networking which is not seen in the appraisal guides (inscription devices). AM acknowledges the importance of "politics and understanding the flow

of the committee meeting," (AM). AM's interessement devices seek to reassemble the political relevancy of the current controversy's coordination (i.e. the way in which AM, as a manufacturer, is used to being treated by the controller for example in a hierarchical order of communicative opportunities). Latour (2005) emphasises the danger of talking of politics without speaking politically:

> "To raise a political question often means to reveal behind a given state of affairs the presence of forces hitherto hidden. But then you risk falling into the same trap of providing social explanations I criticized earlier and end up doing exactly the opposite of what I mean here by politics. You use the same old repertoire of already gathered social ties to 'explain' the new associations. Although you seem to speak about politics, you don't speak politically." (Latour, 2005: p. 260).

I think AM advances the repertoire. Although they initially coordinate behaviour to engage interest by speaking the same small language allowed to them in the committee room (i.e. no marketing messages, well prepared academic responses), they enter new political relevance to the controversy by translating more of their interested actor motivations through the greater communicative opportunities afforded them by the new coordination of social ties.

I have argued that varying strengths of association with repertoires of health economics is an HTA networking element which impacts actor translation of the controversy. The institutionalisation of calculative practices is a further consideration of this networking element. GP was a patient representative and expressed bewilderment at what constituted relevant details for both paper submissions and narratives during appraisal meetings, for example of bringing the best patient to bring regarding the disease severity. GP was highly motivated to appear during the appraisal process as they were the parent of a child with the condition. GP was not a technically oriented person. The alignment of their interests, despite their bewilderment, is argued to be easier to problematise due to their personal motivation. The mystique of the contextually technical elements is argued to be an interessement device as GP adapted their communicative duties according to directions received

from decision makers. A similar observation is made by Lodh and Gafikin (2003) in that the lack of visibility regarding knowledge claims was argued to paradoxically benefit the stability of the claim, as it was constantly seen on the periphery. The fusion of networking elements includes GP's lack of technical background and extreme personal motivation in the OPP.

In contrast to GP, the mystique of calculative practices is shown to not be an interessement device in the case of EP, whose statistics background (as a networking element) meant they felt able to critically dissent calculative practices. EP's background as a statistician coupled with their personal motivation being less extreme than GP's meant that their interests in NICE's version of appraisal calculative practices were unaligned.

> "I was more of an irritant than most patients. I do not know that what I said had any impact at all. The thing about this quality of life thing is that in a situation – 1 is normal and 0 is dead. You could negative scores! I do not know if what I said had an effect..." (EC).

Further named examples of EP's disagreement with calculative practices included a critique of the EQ5D (see Figure 14, section 4.1.4), which was also critiqued by BA.

> "Do you know EQ5D? It's the steam by which the people who do the modelling and NICE evaluate. It is completely childish. They don't ask your family, employer or children as to what they think your quality of life is. They just don't know," (EP).

EP's comments regarding the EQ5D represent qualities of patient interests that they feel should be aligned, but which they do not perceive to be included in calculative practice.

6.2.3 – Enrolment

If the controller's attempts to interest a group of actors into their particular controversy have worked, then it can be said that those actors have become

successfully enrolled (for further detail see section 2.3.4). The goals of the controller have been subsumed by other actors. The identities and roles laid down by the controller are seen as the reality or only way of achieving goals. Actor motivations and interests are invisibly aligned/reshuffled/detoured to coincide with the controllers wishes (Latour, 1987).

Passage through the OPP at NICE meant that several actors felt they had to abide by rules that were strict, and which did not reflect the reality of wider health economics networking. The motivation for appearing at appraisal meetings meant that some actors fulfilled their roles to the best of their ability with some trying to expand upon the given actor identity (for example DM's extraordinary body language for more chances to speak, AM's catalogue of coordinating interessement devices). The alignment of interests, however, has not been invisible. Some actor motivations mean that they enrolled the duties due to little choice for example patient representatives with a direct life benefit. This does not mean that enrolment was complete, nor does it mean that enrolment led to mobilisation. Different network elements highlight the variance in successful enrolment. Perspectives on calculative practice reveal what actors agree/disagree with in the NICE black box.

DP's enrolment with the NICE repertoire is complicated. Their tenure reflects the necessity of their appearance at appraisal meetings: DP had an advanced form of an auto immune condition and depended upon the possibility of innovative treatments being made available. They abide by their duties and communicative opportunities (as a form of calculative practice) but their tenure has also given them insights into aspects of due process which they disagree with: misplaced confidence from decision makers, non-acceptance of clinical experts into the closed sessions, exclusion of social/comparative/opportunity costs from cost/clinical evidence.

BA, despite being a tenured appraisal decision maker, was not blind to perceived inadequacies of certain calculative measures, namely the EQ5D, as it failed to capture clinical aspects of cognition and special senses. BA stated that it would be an "obvious" (BA) thing to make sure there were other measures to account for the

EQ5D's failings. I think BA had enrolled a close approximation of the guideline's calculative philosophy, particularly with the discretion allowed in Chair Person's preference.

AA, another decision maker, was clear in that they drew a boundary around what they had enrolled. The fusion of network elements inherent in AA's justification of actor identity included diagnostic area, personal qualities, tenure and privileging of health economics repertoire. AA did not feel comfortable with the perceived value implications of End of Life care, as a calculative practice. They were keen to distance themselves from any kind of role where one person was valuing the life of another. AA seemed to take comfort in the centralised distance of a purely technical/calculative remit:

> "If you got us all together, we wouldn't say that some people are worth more than others, but how much more. There is a range of ISA's that have been accepted over 30,000. But we don't say it's the end of life therefore the threshold becomes whatever. That's' not a process. Though it seems it might be getting in that direction. The committee isn't really constituted to work out the weight of these things. It's a funny group of people because if you were doing a guideline you would get experts in the disease wouldn't you? And if you were doing research funding you would want experts in methodology so they can judge between a good study and a bad study so its somewhere in between. So we have some lay and some less lay people and then we've got more methodological people and then some of us fit into a couple...we are a mixed bag, but certainly are not a citizen's panel to decide who is worth more than whomever else. I'm glad we don't take those decisions. We are effectively working out which technologies work one at a time and their value to the NHS." (AA)

AA qualifies a necessary catalogue for other entity functions – research funding, guidelines – to include experts (of which there is no guarantee on the appraisal committee). I interpret these as being closer to the function of a citizen's panel, which AA describes as the complete opposite of the appraisal committee remit. However, they have not fully enrolled calculative practice as it currently stands. AA deems the calculative anecdotes described above as "not a process" (AA). In further

testimony from AA, they discuss their opinion that they are not "unconvinced" (AA) that the physical representation of the patient voice, at lead team presentations, is "valuable" (AA). They qualify this by adding that the absence of their presence from committee meetings would represent an "imbalance in the voices" (AA). AA is unconvinced by this part of the calculative process; they have not been successfully enrolled with this actor's problematised identity. It is interesting for AA to differentiate between their continued contribution as an appraisal decision maker (and thus sustaining the black boxed controversy) and their personal qualities/motivations (network element).

BA's description of how they prioritise communicative opportunities (a form of calculative practice) based on Chair person's discretion is linked with AA's comments. I interpret BA's and AA's enrolment to include a strong assumption in the power of decision maker's preference. Although centralised calculative practice is outlined in the appraisal guides (which control the HTA black box from a distance), the judgement elements of decision making that are represented in Chair person's discretion, hold great significance. The variance of perspectives regarding HTA calculative practices related to personal qualities and motivation (as a networking element) is emphasised in AA's account. I interpret two realities from AA's words a) an inclusive and accountable HTA process which includes the presence of all actor voices and b) a decision process guided by very specific notions of what constitutes the necessary calculative bases for a cost/clinical efficiency decision, that maintains a tick box sacrifice of aligning patient voices during appraisal meetings in order to satisfy an accountable public.

AM's enrolment of calculative practices was linked to several of the HTA networking elements which I have established as variables in actor translations of the HTA process. Their tenure had allowed them to establish a catalogue of their own interessement devices which could align the appraisal committee more efficiently with the manufacturing voice. Their acknowledgement of the institutionalisation of health economics is represented in the divergences caused by ERG allocation. AM

had problematised a wider network of Health Technology Assessment and used this to try and control NICE calculative practices as much as possible.

CM places NICE within a very particular space/time boundary. They extend their network involvement in the "small world of health economics" (CM) to reflect the scope of NICE's power to meet the goals of all the actors involved and the efforts that they (CM) can put in to ensure their goals are met. CM problematises the boundary of NICE to be finite in meeting the goals of all entities. They extend their network involvement by actively using particular calculative practices, such as end of life criteria, to ensure actor goals are met. They had enrolled a view that NICE was limited within a wider political network of diagnostic associations. In one example they state that cancer drugs are "highly political" (CM). They referred to the political assemblages of resources and relations again in reference to their connections outside of the HTA network boundary, primarily the Department of Health. In reference to the "small" (CM) world of health economics, CM's evidence is interesting as they indicate they have enrolled a representative duty: "when it comes down to working with NICE it's an even smaller world. But this makes it more interesting because people know each other and that's good," (CM).

6.2.4 – Mobilisation

If enrolment has been successful, then the black box can be said to be stable. Problematised actor interests have been successfully shuffled/realigned/detoured in an "invisible" way (Latour, 1987: p. 116), in other words, they have been translated into the controller's interests. In Callon's (1986b) paper, the larvae have been transformed through a series of assigned intermediaries. The entire population of larvae is represented through the few specimens that the three researchers originally studied.

> "A few larvae are considered to be the official representatives of an anonymous mass of scallops which silently and elusively lurk on the ocean floor. The three researchers negotiate the interessement of the

> scallops through a handful of larvae which represent all the uncountable others that evade captivity. The masses at no time contradict the scallops which anchor themselves. That which is true for a few is true for the whole of the population." (Callon, 1986: p 12).

It is in this last point of the sociology of translation that one of the key contributions of this thesis lies. The ability of the larvae to act as a spokesperson for the entire population of larvae, regarding whether or not it anchors itself, is under scrutiny. The researchers have transported the larvae and other controversy elements through convincing inscriptive transformations, to the laboratories and conference rooms of the scientific community. NICE, a centralised decision entity, transports entire populations that have as much in common as they do in difference. And this accountable audience arguably has more command of a universal repertoire (stable enough at a distance at least) in the form of monetisation – public service entity financial budgets – than the larvae.

The ability of chosen representatives to act as a spokesperson for the audience they represent at NICE is problematic enough. The boundary around what constitutes different populations could be so dizzying, particularly in the way of Latour (2005): endless ravelling and unravelling of social ties in a debate about matters of fact, over matters of concern. The matter of concern is the motivation of the independent viewer, which in this case, is to discover qualities in the centres of calculation that are a) validated by the majority in this centralised decision framework (and so allow the black box to remain unchanged) and b) represent what Latour (1987) described as "the fast mobilisation of the largest number of elements and their greatest possible fusion," (p. 237).

The ability of HTA decision makers to make decisions based on the greatest fusion of these elements has been shown to vary in opinion. DP was very concerned at the lack of clinical specialists in closed decision meetings. Their tenure had allowed them to see that decision makers, who had tenured experience of appraisals with their diagnostic area, equated experience with expert knowledge. DP witnessed the Chair

"expertly" (DP) using "specialist" (DP) repertoire which DP had no associations with:

> "…because he sat on every (chronic auto immune condition) TA, he began to think of himself as a (condition) specialist and as an expert in (condition). He would come out with things like 'well when it burns out', and it doesn't burn out! Things like that…you would sometimes want to go and smack him because he would come across sometimes as quite arrogant because he knew it all, but actually he didn't (on some things) truly understand what he was talking about." (DP).

DP did not mobilise or advocate the appraisal process, as it stands in their experience. The contributor dynamics (for example friendships with clinicians) that evolved during DP's tenure means that DP places NICE's function and processes in different strengths of dispensability.

GP felt that there was great difficulty in the ability of NICE to centrally mediate the large number of elements in their rare auto immune related technology. The specifics of the condition mean that patients with severe forms are potentially housebound:

> "The one I did take originally had low levels and NICE took him as all patients (to be the base case). When they read the testimony they did listen and then they asked questions referring to that patient. You really have to get that over. Not like with cancer because everyone knows someone with cancer. Rare disease people have a hard time on this" (GP).

The ability for less severe patients to represent this at meetings means that central calculative practices take a base line which does not communicate the assemblage of ties that are particular to that diagnostic audience. I interpret GP's concerns as dissension regarding the representative ability of the spokesmen. The centralised nature of NICE as a public entity is of particular relevance here. The concerns on the representative ability of the spokesperson are one side of a double edged sword. The previous system of HTA was within the local level, with the issue of post-code prescribing being a contentious issue (confirmed by interviewees). However, with a larger budget and larger population to account for, NICE as a central entity acts from a distance, with criticisms like GP's being symptomatic of a centralised calculative

framework which reduces complexity to a manageable level, as found in chapter one. Concerns like GP's are mirrored in BA's comments regarding "badly done by diseases" (BA) in the NHS. The ability of a centralised NICE to act as a spokesperson is therefore linked to the divergent HTA network elements discussed in this thesis.

EC had not engaged with the NICE HTA reality. In some anecdotal examples, they cited the very cost gauging function of NICE to be absolute proof in denying their ability regarding "bettering people" (EC):

> "Does NICE actually add anything to what is there in the literature? Apart from some assessment of cost it probably doesn't. Just to give you an example one drug is restricted to a body mass of a certain level. That limitation was made entirely on the basis that if you compare the cost of modern medicines with these new injections then once the person goes beyond the body mass index of 35 kilos per litres squared, then the amount of insulin that they typically are treated with costs more than the new drugs. So the limitation is not being made because they are bettering people who are fatter, or because the evidence from all the pre-licensing trials shows that these people are a good group to treat. It was entirely based on the cost. This then becomes this weird gospel that we use these drugs on people that have this degree of obesity when there is not a legitimate clinical reason to use these drugs on someone who has a BMI of 31. Are we really in the game to make people put on weight so they can use the drugs? It is crazy stuff". (EC)

The earlier reference to the NICE reality as differing from the reality of HTA in wider framed networking is again espoused by EC here. The anecdote used by EC is taken to be a stark difference in intended outcomes for a public service health entity.

6.3 – Answering Research Question Two - What do these network elements reveal about HTA calculative practices at NICE?

A recurring theme of actor translations has been that there are two realities to contend with in HTA networking, particularly for those actors who problematise

NICE's function within the boundary of a wider network of Health Technology Assessment. The key findings of this case study are the identification of networking elements which act as variables in actor translations of centralised calculative practice. The divergence between the controlled-at-a-distance controversy elements contained in the inscriptive appraisal guides and the "people in the land" (Latour, 1987: p. 234) accounts reveals qualities of calculative practice which features the accounting and healthcare issues identified in chapter one.

Mouritsen (1999) found two distinct modes of managerial control: the paper form (centralised, controlled at a distance) which espoused a philosophy of profitability and the 'hands on' approach was closely tied to the locality of processes and represented flexibility and innovation. This thesis questions the centrality of calculative practice at NICE. McNamara (2004) argues that instead of a privileged assumption on the centrality of accounting technologies, we should consider them in a wider constellation of organisational knowledges. In considering the flexibility inherent in such a constellation, another perspective of the centralised calculative practices defined in the inscriptive appraisal guides is possible. The inscriptions mobilise a series of boundary objects which have stable enough associations that they signal different concepts, but are flexible enough to mediate the heterogeneous variances caused by the HTA networking elements identified in this case study. Rautianinen and Scapens (2013) similarly found that accounting technologies can be considered as boundary objects which transform human actors.

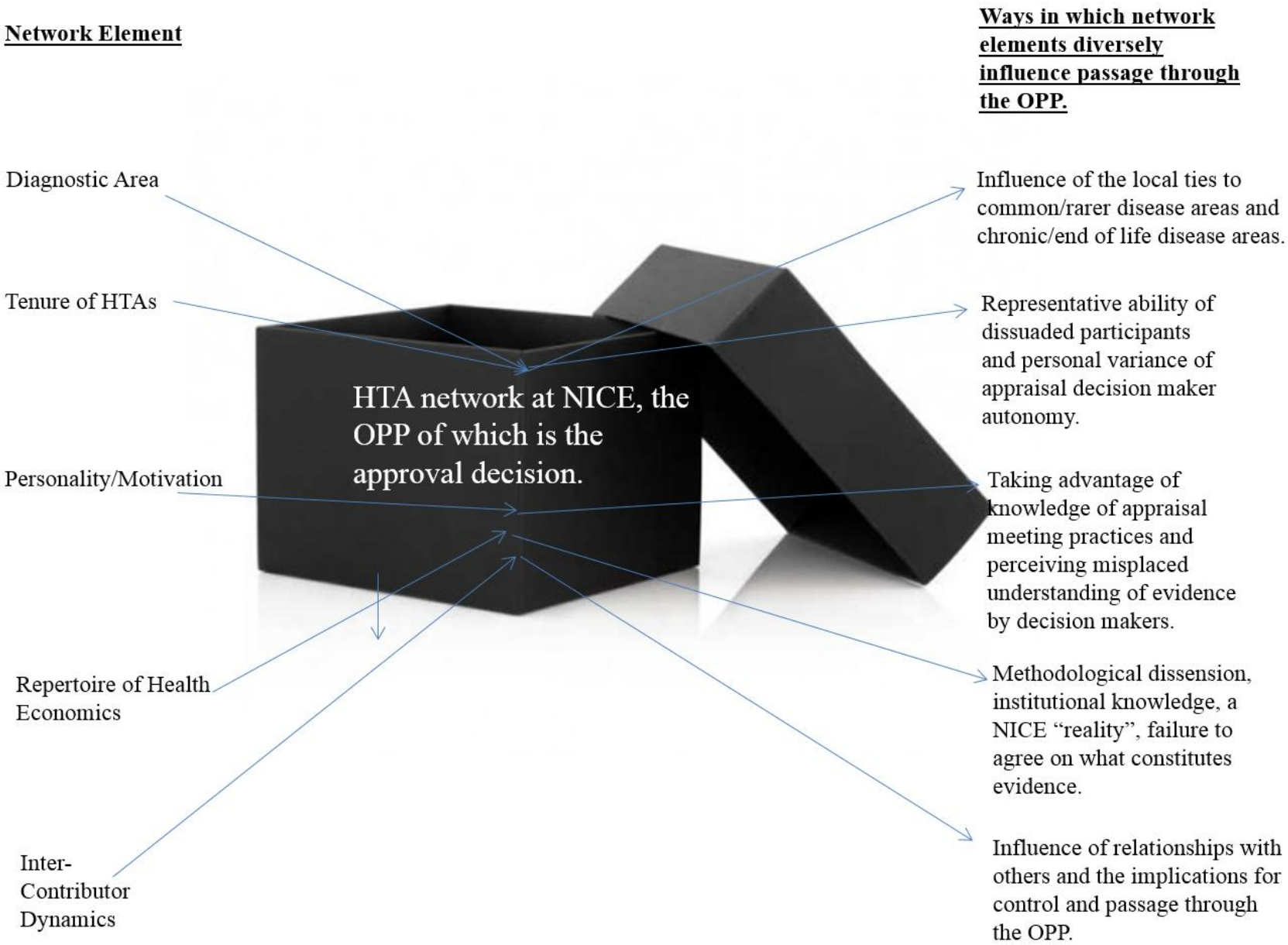
There are similarities between this rationalisation and the case study findings. The scope of the measures dependent upon decision maker's heterogeneous judgement are shown to have a big impact on the application of centrally defined calculative practices. Such measures include Chair person's discretion and the reference case. What constitutes calculative practice is also taken in broad terms. A reflexive form of calculative practice is encouraged by accounting theorists, particularly in times of political change (see Skaerbaek and Melander (2004) and Carrington and Johed 2007). The change towards value based pricing, although merely speculated upon at

the time of interviewing, is reflected on in actor's dissatisfied translations of current calculative practice, for example failure to account for social costs in HTA.

There is a black boxed reality of health economics and a reality of health economics that is variably influenced in the network extension journeys described in actor HTA accounts. They are examples of controversies which have been enrolled partially or in unexpected ways. Calculative practices and what constitutes a definition of technical in this controversy, is thus taken broadly. Figure 16 shows the ways in which identifies network elements have an influence over passage through the OPP. The title of this thesis is "Opening the Black Box of the Health Technology Assessment Process at NICE". In chapter one, I introduced the first in a series of conceptual diagrams which featured a black box.

The contents of the black box are the networking elements which have only been revealed in speaking directly with HTA contributors and decision makers. This is the exploratory part of the NICE case study (see section 4.3.1). The qualities of calculative practice that these network elements reveal, is the explanatory part of the NICE case study (see section 4.3.1). Figure 16 conceptually shows both the exploratory and explanatory findings of the NICE case study. The contents of the black box are shown i.e. that new information which could only be sought by going back to the people of the land. Each exploratory finding is linked to an explanatory facet/quality of HTA calculative practice, remembering that the OPP is balancing central calculative practices and required subjective judgements regarding localised healthcare complexity. For example, Figure 16 shows that as a networking element, the diagnostic area which a technology is related to means that there are particularly local influences and associations which challenge the consistency of calculative practice. As a networking element, inter-contributor dynamics could diversely affect passage through the OPP; unexpected relationships with other actor groups could mean issues of control within the network and questions of influence over evidence judgements.

Figure 16 - Showing network elements and their influence on passage through the OPP



What constitutes calculative practice is taken broadly. This thesis advances the need for such a broad view, particularly in light of the free association given to what constitutes evidence in this case study (for example complex institutionalised models and heterogeneous patient narratives – both of which are subject to the HTA networking elements). As discussed in chapter two, Cuganesen (2008) found that two networks existed which enacted mobilisation through the use of differently oriented calculative practices. Quattrone (2009) found that visualisation and imagination engendered calculative practices with the ability to be more than an "ability which goes beyond simple arithmetic to extend and comprise the possibility of organising knowledge in topical ways" (Quattrone, 2009: p. 113).

Quantitative measures were not presumed to be preferential as per Callon's (1986b) principles of agnosticism, free association and generalised symmetry. The constitution of cost/clinical evidence includes communicative opportunities/narratives from all actors. What is represented in more 'technical' measures is shown to be subject to institutional controversies for example DP and AM's comments on ERG modelling. Decision makers enrolled a need to have an open mind to all forms of calculative practice, including the weight of narratives. Qu and Cooper (2011) similarly found that the success of inscriptions' power to mobilise was tied to the ability of the contextual actor to imagine "non-quantified features of a BSC (such as objectives, consensus, access and awareness)" (pp. 359).

Calculative practice at NICE, in many actor translations, was not successfully enrolled as a centralised process. Actors often used network extensions to justify their environment and identity. They problematised the centrality of NICE within a wider framework of national and international appraisal networking. Lowe (2000) commented similarly that the process of translation can occur at different levels: "similar effects are also taking place outside of the hospital when we view the hospital as just one node within a much larger network which takes in the Transition organisation, other health providers and funders across the world and the technical literature," (Lowe, 2000: p. 84) . The wider network of appraisal networking was

also subject to the unique complexity inherent in the healthcare empirical site. Chapter two brought together the qualities to consider for accounting technologies in healthcare; complexity and institutionalisation, reductive nature of calculable frameworks and the enrolment of clinical actors with an economic efficiency repertoire.

The accounting assemblage which I argue this thesis contributes to is defined in Justesen and Mouritsen (2011) to be "networks, organisational boundaries and the role of mediating instruments" (Justesen and Mouritsen, 2011: p. 74) . Other studies in this area included Mouritsen (1999), Chua and Mahama (2007), Mouritsen and Thrane (2006) and Miller and O'Leary (2007). The contribution of this thesis is tied to the choice of empirical sites. The topic of accounting translations is not new to the accounting literature. However Broadbent and Guthrie's (2008) call for contextually technical work is met here.

6.4 – Chapter Summary

This chapter answered the second research question set out within the introduction: **what do these network elements reveal about HTA calculative practices at NICE?** The answer to the first research question was confirmed as the five network elements discussed in chapter four. These were diagnostic area, personality/motivation, tenure of HTAs, repertoire of health economics and inter-contributor dynamics. The account of the HTA process (see sections 2.2.1 – 2.3 and 5.1.1 – 5.1.4) is taken as the controlled from a distance account perpetuated through the appraisal guides (NICE, 2009, 2013) which act as inscription devices. The retention of elements required to lock allies into place, as reflected in these inscription devices, is challenged by speaking directly with contributors and decision makers (the people in the land).

In answering the second research question, Callon's (1986b) sociology of translation was applied to actor accounts of the HTA process, in cross reference with the

revealed network elements. Network elements were shown to diversely affect passage through the OPP in a fusion. Actors' views on the apparent indispensability of NICE were shown to be affected by multiple network elements. What this revealed about calculative practice centred on the reflexivity of form which calculative practice could take for example variability in chair person's preference.

The interessement of actors (see section 6.2.2) was shown to be challenged by some actors who had developed their own set of interessement devices. Chair person's discretion is an important interessement device in controlling the discussion of salient information (to them) and thus of the calculative practice of narrative opportunities from those present at appraisal meetings. The heterogeneity of chair person's autonomy is shown to be an influence on calculative practice, with such heterogeneity being seen as part of the personality/motivation networking element. Other actors challenged the control of the OPP with their own interessement devices for example AM and their co-ordinating behaviours.

The enrolment of actors (see section 6.2.3) was shown to be closely tied their local associations. Some actors had limitations into how far they could extend their network involvement to satisfactorily pass through the OPP. DP felt that their increased tenure meant they could identify misplaced understanding of evidence by decision makers. However, the only access to vital treatment that they depended upon was through the NICE OPP. They were limited in what they could do to unlock themselves from set contributor duties and definitions. Other actors had enrolled a positive view of NICE but placed it within a wider context of HTA. One decision maker, AA, had enrolled two conflicting views on the network; their personal feelings which included the view that the patient voice is best interpreted through documents rather than at the appraisal meetings and their professional view which stated that it would cause an "imbalance of voices". In these instances, calculative practice was fulfilled by contributors and not actively challenged within decision making.

The mobilisation of actors (see section 6.2.4) with the HTA network at NICE was diverse. Some actors had mobilised a view that NICE perpetuates a clinical "reality" which is alien to their local associations. The question of what is evidence, an important aspect of calculative practice, was shown to be affected by such mobilisation. This mobilisation was affected by a fusion of networking elements which included the diagnostic area that a contributor was coming from and their repertoire of health economics. Methodological dissension was common amongst all actor groups.

The next chapter will conclude this thesis and discuss the contributions, research limitations and the future research agenda.

CHAPTER SEVEN
CONCLUSIONS, CONTRIBUTIONS, LIMITATIONS AND FUTURE RESEARCH

7.1 – Conclusions

The motivation for embarking on this PhD journey was discussed in chapter one. Adam Wishart's body of work introduced the compelling stories of patients and other actors who had been involved in the HTA process at NICE. The health resource allocation debate relating to HTA and NICE, contained tensions between finite public budgets, patient rights to healthcare and the issue of meeting these rights given diagnostic diversity. On a personal level, I was motivated to understand the decision process which gave access to different health technologies, having previously felt bewilderment at the calculative practices involved in clinical efficiency decision making. In chapter one, I outlined the contextual tensions of HTA, accounting and healthcare issues in order to justify the two research questions I have answered throughout this thesis. The first research question was **what network elements are revealed in speaking directly with HTA contributors and decision makers?** The second research question was **what do these network elements reveal about HTA calculative practice at NICE**?

As an accounting student, my context was guided by a review of accounting and healthcare literature. The accounting and healthcare issues surrounded three areas which were the representation of multiple values, healthcare complexity and mobilising accounting practices within the healthcare boundary. These were applied to DRGs to highlight the applicability of these issues to the calculative practices within HTA. Chapter one showed that the healthcare boundary is a complex issue. Chapter two presented the elements used to build a theoretical framework which could examine these accounting and healthcare issues, with particular emphasis on the boundary issue. ANT was introduced and the works of Callon (1986b) and Latour (1987, 2005) were outlined as the foundation for the theoretical framework. The accounting and healthcare literature was reviewed for studies which use ANT.

Several practical implications were found, which guided the HTA case study for example the length of time spent observing in-action networks, the reflexivity of accounting practices.

The research methods were outlined and justified in respect of the semiotics-rich nature of ANT. The case study method was critically defended. The application of case study methods was explicated in terms of the HTA field study. Data collection details and analysis processes were described. In chapter four, the context of NICE and of HTA was given. Figures of the HTA process were included in diagrammatic form. In accordance with ANT principles, the identification of actor groups associated with the HTA controversy was initially guided by the accounting and healthcare issues and then materially confirmed by appraisal meeting observations and by the actors themselves ("the people in the land" (Latour, 1987: p. 234)).

Key findings, from analysis detailed in chapter three, provided the answer to the first research question: **what network elements are revealed in speaking directly with HTA contributors and decision makers?** These network elements included; diagnostic area, personality/background/motivation, health economics repertoire, HTA tenure and inter-contributor dynamics. The black box of HTA which NICE perpetuated through such inscription devices as the appraisal guides (NICE, 2009, 2013) was the stabilisation of multiple elements. These elements represented the interests of actors who were necessary to this version of the controversy. Does the representation of these actors, from a distance, sacrifice some fusion of HTA networking elements? The HTA contributors and decision makers are the people in the land. In speaking with them directly, I was going back from what Latour (1987) called the "nth final inscription" (Latour, 1987: p. 34).

In going back to the people in the land, the detailing of these network elements revealed aspects of HTA calculative practice which were not represented within the black-boxed view of the HTA process. Callon's (1986b) sociology of translation was applied to these network elements to answer the second research question: **what do these network elements reveal about HTA calculative practices at NICE?**

Mobilisation of the NICE controversy was varied. Actors extended their network involvement beyond the boundary of the NICE HTA process, if their goals had not been completely satisfied through passage of the OPP. This was reflected in perceptions of calculative practices. The NICE definitions of evidence and health economics reflected a reality which was not mobilised by all the actors.

Methodological dissension was a central issue, particularly with actors who felt they had a technical role. Named measures such as the EQ5D were critiqued. Other calculative practices were recognised, which were only revealed in examination of the network elements. These included the hierarchy of communicative opportunities allowed to HTA contributors, by decision makers. The forms of calculative practice described by the actors were diverse, for example named measures, narrative opportunities, chair person's discretion and the reference case. These calculative practice forms were regarded reflexively, an accounting principle which drives my methodological enquiry and were revealed in a symmetrical analysis of all actor accounts. I did not presume anything regarding the ability of any calculative practice to act as an inscription device. I demonstrated the agnosticism required of Callon's (1986b) model in the independence I held from the controversy. I remain a novice of health economics and I feel that this helped to distance me, as a researcher, from a priori alignment with contextual politics.

7.2 – Contributions

In examining HTA at NICE, I have introduced a topic and empirical setting which are relevant and interesting to accounting research, particularly to accounting and healthcare research. The main contributions of this thesis largely centre on the originality of the empirical site, to the accounting literature. The impact of introducing this new site can be seen in multiple ways. In Chapter Two, I overviewed non-accounting HTA literature which outlined the key tensions within the healthcare decision making. I highlighted the similarities of these issues between general

accounting and healthcare studies and more specifically with DRGs, which informed the conceptual framework used in the analysis of case study findings.

By finding synthesis between non-accounting literature and findings from accounting studies within healthcare, I have extended the reach of applicable findings within existing accounting literature. In chapter three, I further developed the conceptual framework. By its nature, ANT, is not a generalisable theory of the social. The rigour of what ANT could provide, as a conceptual framework, to answering the two research questions was outlined in three ways. The three themes, a) representing values in healthcare b) healthcare/empirical complexity and c) mobilising accounting practices within a clinical boundary, from chapter two were taken as thematic starting points for review of accounting and healthcare uses of ANT. Guidance gained from this structured review included a) accounting boundaries should be reflexive and take broad views of calculative forms b) the issue of timeliness of network observations and open mindedness about contextual associations with accounting/calculative practices c) hybridisation of actors and governmentality of clinical actors within a network. In respect of the originality of the empirical site, I have contributed interesting findings regarding accounting practices in healthcare decision making to a small number of accounting and healthcare studies which have used ANT for example, see Lowe (2000) and Dambrin and Robson (2011).

7.3 – Limitations

In respect of practical research limitations, these included data access issues in failing to gain permission from NICE to attend the closed session of HTA appraisal meetings. Other limitations include my inability to pursue initial contacts made at the Scottish Medicines Consortium (SMC) due to the practical restrictions of time and other resources.

In chapter four, I recognised the methodological limitations of ANT. Whittle and Spicer (2008) found that there were limitations in the methodological claims made

by ANT theorists. Claims towards ontological relativity are seen more as ontological realism. To some extent, the empirical findings represent such critiques – the treatment of human and non-human within the NICE case study could be argued to be asymmetrical. It is not that I disregarded the agency of non-human actors within the HTA network – the finite healthcare budget for example had agency in respect of determining the necessity to communicate an economic rationale for a decision making process which involves subjective value judgements. However, I felt that the answers to my research questions came from the human actors represented in the public account of the HTA process. I find that the issue of non-humans is so controversial within ANT, that some expect their inevitable presence in any ANT study.

Again in respect of Whittle and Spicer (2008), claims towards epistemological reflexivity are seen more as epistemological positivism. The empirical findings from the NICE case study could potentially be seen in a positivistic light rather than reflexive – in asking the first research question, some could argue that I have simply stated things how they are. Whittle and Spicer (2008) find that this positivism limits ANT's ability to critically challenge power relationships. I argue that my empirical findings are both exploratory and explanatory. By going back to the people of the land, who are represented via inscriptions in the public account of the HTA process, I am providing the initial exploration of HTA terrain. I am re-opening the black box of HTA to eventually challenge the contents. The first step in doing so is to determine what those involved feel about the process, to find out if their interests are fully represented in the use of current calculative practices and if they disagree with the public account which represents their involvement. I am providing a platform for voices in society to be heard, which I argue is the first step in critically challenging the power relationships within HTA decision making.

Lastly, in respect of Whittle and Spicer's (2008) tri-part critique of ANT, claims towards political radicalism are seen more as political conservatism. I disagree with Whittle and Spicer's (2008) summation of ANT's attention to political dynamics, with respect to my own empirical findings. The status of non-human actors has not

impacted the findings at NICE, as the focus has been on the people in the land. The network elements uncovered in speaking to these people, encapsulates the very opposite of what Whittle and Spicer (2008) define in their meaning of political conservatism: "ANT...reduces meaningful action to utility maximisation and evades a commitment to emancipation, however local and small scale," (Whittle and Spicer, 2008: p. 622). Key findings at NICE included the minutiae of process mechanisms which actors felt impacted their representativity at appraisal meetings, both those that they flexed (from given actor duties) and those that they created.

7.4 – Future Research

In chapter one, I outlined the key tensions of the health resource allocation debate relating to HTA. Adam Wishart's body of work introduced the compelling power of patient narratives. Harris (2005) critiqued HTA decision making at NICE, particularly regarding the fairness of the QALY. He found that, as a technology, it discriminated in respect of age. Paulden and Culyer (2010) examined if the QALY discriminated those with short life expectancy. They conclude that the QALY is still necessary and if a better measure can be found, it must still operate with the principle of providing common ground amongst healthcare complexity and an economic rationale within the context of finite healthcare budgets. The fairness of outcomes within HTA practices is a debate of contrasting tensions. I wish to continue working and contributing to this debate, particularly in relation to the current issues of adopting value based pricing at NICE. In future accounting work, I wish to contribute to social accounting literature. Analysis of fairness in HTA practice for value based pricing (which is new and thus calculative practices will be in development) will benefit from the representation of the actor voices involved, as it is arguably even more problematic than the social value judgements made currently.

At the time of writing, I have several promising research appointments with members of the **research network I have cultivated. I hope to engage with the SMC in the near future.** I feel that this research experience has prepared me for a career in other

accounting and healthcare research areas. The development of HTA network contacts I have cultivated includes professionals who work for academia, charities, patient advocacy groups, pharmaceutical companies and government departments. My role as an accounting and healthcare researcher could be developed with future work at multiple sites.

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APPENDICES

APPENDIX A

A - Patient Article for Online Magazine

My name is Stacey McPhail and I am currently a doctoral researcher at the University of Strathclyde, Glasgow. My first degree is in accounting and I have always been interested in the more advanced topics of study which discussed the potential for accounting to tell the story of our actions, our impact upon society in a manner which goes beyond the level of the profit and loss account and balance sheet.

By listening carefully to people's stores and considering the context within which they are told, we can develop our relationships and come to have a greater appreciation of each other's positions. These 'stories' are as much an 'account' as other more traditional forms of accounting. Through careful analysis, we can discover complex and subtle mechanisms by which we both hold others to account and are also held accountable, that are sometimes not formally realised in organisational settings.

I have always been fascinated by the management of diverse stakeholder interests, and how these interests are mediated by organisations for example what are the tools involved in representing diverse stakeholder interests, the management of sometimes 'conflicting' needs of different users. After watching the documentary, 'The Price of Life' in June 2009 - by the journalist Adam Wishart - I became intrigued by the drug approval process conducted within the National Institute for Health and Clinical Excellence (NICE). I saw that there are so many diverse yet necessary forms of evidence required in reaching the drug approval decision and questioned where, when and how social voices can be heard.

Through my ongoing research I am finding patient testimony provides committee members with first-hand experience of how drugs really impact patient's lives; clinicians evidence provide expert knowledge on the clinical impact of the drug; the manufacturers' testimony provides an economic perspective on pricing decisions; the Evidence Review Group (ERG) whose role is to ratify the manufacturers evidence and address issues on the very technical aspects of drug efficiency ; and committee members whose occupations can vary – laypeople, medical staff, academics who are purposefully not experts in the health area relating to the drug/technology. All these representatives in the process have very different roles, varied social interests – and potentially different 'accounts' to give but each contributes to the decision of whether or not drugs can be prescribed on the NHS in England.

My interviews with people from all of these different stakeholders have uncovered so many intriguing accounts. For example, I was very kindly invited to the home of the charity founder, John Smith, where I heard a particularly enlightening account of experiences as a patient representative in the drug approval process. What I gleaned

from this insightful account, and those of others, is that there are processes and tools employed in the drug approval process which go undocumented. The 'human' part of the process not accessible from the standardised pro-forma's available from the NICE website, is told through my interview findings: how the management of the public sessions of technology appraisals is conducted. There is definitely a performance factor in reaching the drug approval decision: how does each stakeholder group act and interact in meetings. These are the elements which I wish to 'uncover' as examples of these complex mechanisms of accountability and the 'accounts' provided by stories told which would not usually be heard by the public.

If anyone is interested in speaking with me regarding their experiences of the drug approval process, or is simply interested in chatting through my research, I shall be at the X patient conference in X on the Xth of X 201x. You can email me at *****, if you have thoughts you would like to share with me regarding the themes discussed in this article.

I would like to finish with a big thank-you to John Smith for all of their kind help in assisting a struggling doctoral researcher from Glasgow - thank-you John!

*Please note that I have anonymised revealing details from this article, consistent with the anonymisation of findings in this thesis.

APPENDIX B

Department of Accounting and Finance
Examining the social accounts inherent in the drug approval process

As part of my doctoral studies, I am looking to examine the social accounts inherent in the drug approval process. This involves a holistic examination of the people, resources and motivations involved in the decisions made by the National Institute for Clinical Excellence in Health (NICE). The 'social accounts' refers to the varying perspectives of social groups that are going to be evaluated, to find out where they see a social voice being heard.

While it is made clear that the literature provided by NICE is intended to give clear accountability to the public, there are evidently issues of translation between the decisions that are reached orally in committee sessions and the final formatted documents that are made available on the NICE website. I am seeking to hear the 'human' voice of the people that are directly/indirectly involved in the process that reached this final documentation stage.

You have been selected for this interview due to your health related background and the potential insights you hold into how the drug approval decision is made.

Below is an open list of the areas in which I plan for the discussion to potentially range. **I would ideally like to record the interview on a digital recorder but only with your permission. I am not seeking any confidential/personal data of patients/companies/vulnerable groups**. I am seeking to explore some of the tensions I have observed as being part of the drug approval process from back-ground reading and from attendance at technology appraisal meetings as a public observer.

1. What do you perceive to be your role in the process?
2. To what extent do you think they represent a social perspective?

3. I have identified various social groups within the drug approval process for example manufacturers, ERG, committee members et cetera : in your experience, to what extent do you think they give a social voice and how is this represented?
4. Do you think representation of social interests varies with the process of different types of drugs?
5. Are there any particular rituals in appearing at committee meetings that mean its more or less accessible to social groups?
6. Your involvement/experience/opinion with NICE as an organisation for example how effective is the guidance they issue to the public (non-specialist knowledge)?
7. How would you compare the NICE approval policy with an alternative system that adopted a 'post-code lottery' approach with respect to social benefit?
8. What is your opinion on the proposed changes to NICE's remit – particularly on the issue of value for money?