A Review of Mixed Methods, Pragmatism and Abduction Techniques

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Abstract: The purpose of this paper is to propose that mixed methods research is complementary to traditional qualitative or quantitative research, also that pragmatism is an attractive philosophical partner for mixed methods. A key feature of mixed methods research is its methodological pluralism that can lead to superior research. The research question is whether 'pragmatism' as a philosophical choice to combine positivism and interpretivism can lead to an appreciation of 'what works' in practice? (Tashakkori & Teddlie, 2010). The paper posits that pragmatism supports the use of different research methods and that a continuous cycle of inductive, deductive and when appropriate, abductive reasoning, produces useful knowledge and serves as a rationale for rigorous research. Firstly, the so called "paradigm wars" of quantitative or qualitative analysis are briefly reviewed; and the tenets of pragmatism are explained. A comparison is made of the different approaches and the value of applying abduction techniques to 'surprising facts or puzzles'. Secondly, the literature regarding the ubiquity of abduction techniques is explored. Third, two recent empirical case studies in the airline and engineering sectors are summarised. Abductive thinking was key to explaining empirical phenomenon relating to competition, and in particular how leading UK and German multinationals developed rather different approaches to outsourcing. Finally, in conclusion, mixed methods were found to combine numerical and cognitive reasoning that led to a 'best answer' to data that otherwise could not be adequately explained. Furthermore, the application of different approaches can lead to research and subsequent management decisions that reflect both the interplay of social and scientific aspects of the world today.

Keywords: mixed methods, pragmatism, paradigm wars, abduction, empirical phenomenon, case studies

1. Introduction

This paper focuses on mixed methods and the extent to which a combination of different approaches can lead to better research and subsequent management decisions reflecting both the social and scientific aspects of today's world. The overall purpose of the paper is to argue that mixed methods deserves consideration, and may be especially attractive as a choice to relatively new researchers with an open mind as to how to tackle a particular problem, especially in the fields of social science, business and management studies.

Firstly, a comparison is made of different, perhaps traditional research approaches, and the value of applying ideas such as pragmatism and abduction techniques that are less well known to surprising facts or puzzles. Secondly, the literature regarding the ubiquity of abduction techniques is explored. Third, two recent case studies are summarised where abduction thinking was key to explaining empirical phenomenon relating to competition in the airline and engineering sectors; and how UK and German multinationals developed different approaches to outsourcing in the same sector. In conclusion, mixed methods were found to combine numerical and cognitive reasoning that led to a 'best answer' to data that otherwise could not be adequately explained.

2. Mixed methods - choices

Evidence of growth in the use of mixed methods research has in a wide range of academic fields notably social sciences and business management (Tashakkori & Teddlie, 2010). In 2007, SAGE launched a Journal of Mixed Methods Research. There have been arguments about the relative merits of paradigm choices drawn from quantitative versus qualitative methods, positivism versus interpretivism, and whether it was naïve (or worse) to mix or attempt to use techniques drawn from paradigm extremes. Terms such as pragmatism and abduction have also now become more widespread in their use. Researchers, perhaps those more recently qualified, have been able to employ both deductive and inductive analysis in the same research study. The mixed methods approach to research provides researchers with the ability to design a single research study that answers questions regarding the nature of phenomenon from a participant's point of view as well as the relationship between measurable variables (Williams, 2007). Supporters of mixed methods promote doing *'what seems to work'* to investigate, predict, explore, describe and understand the phenomenon. That

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quantitative and qualitative research approaches are not only compatible but also complimentary, underpins the need for continued research studies that deploy mixed methods (Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2010). Fig 1 below is both popular and helpful in making choices regarding research philosophy, approach, method, strategy, time horizon and subsequent techniques (Saunders & Thornhill, 2012).

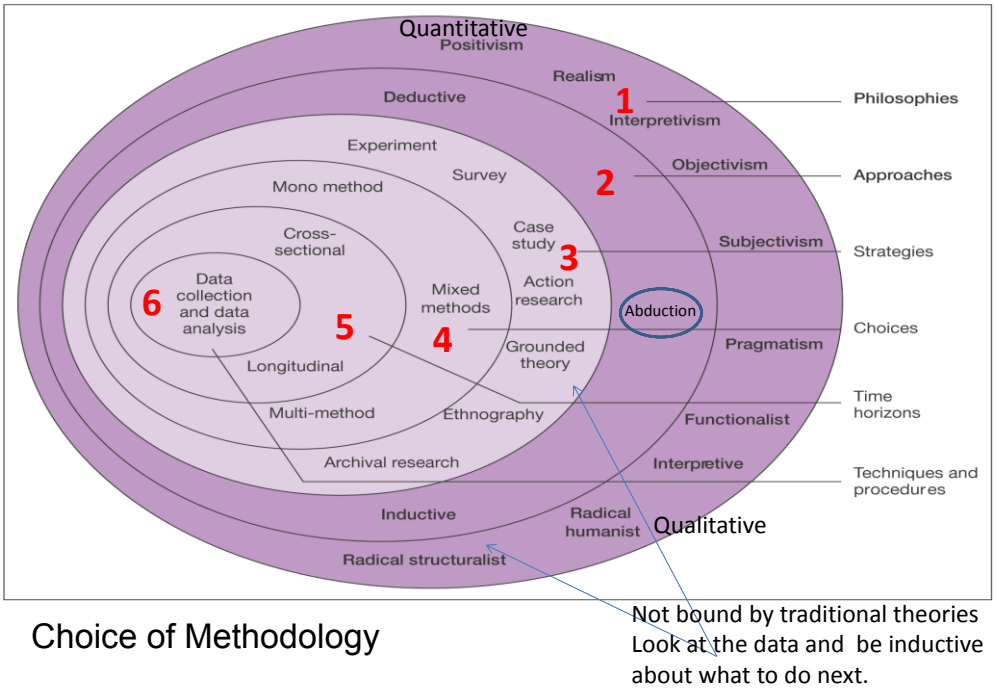

Figure 1: Research Onion adapted from ref: Saunders, Lewis & Thornhill (2012)

2.1 Deductive and Inductive approaches

The approach selected has traditionally been either inductive reasoning where a series of specific observations lead the researcher to a general conclusion that may be true (Dudovskiy, 2016); or deductive reasoning that starts with a hypothesis or general rule that is then tested with data, and only if found to be true leads to a specific conclusion. See Fig 2.

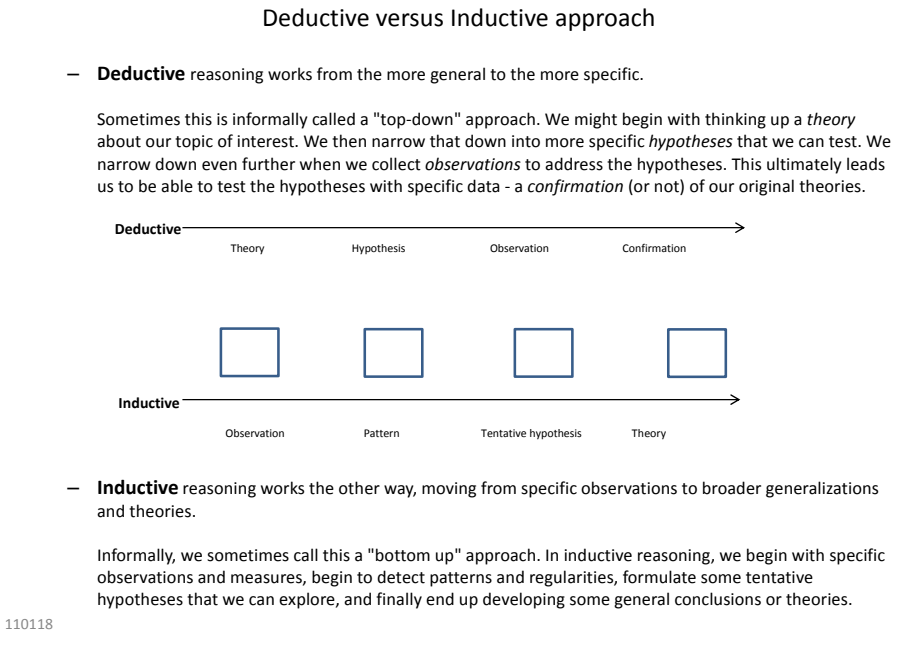

Figure 2: Paradigm War 1 – comparing deductive and inductive approaches

1.2 Combination of approaches - Abduction

However, there is a third choice of approach. Abductive reasoning also referred to as 'abductive approach', is set to address weaknesses associated with both deductive and inductive approaches (see 3. Literature Review below). Abductive reasoning, follows a pragmatist perspective, taking incomplete (or 'messy') observations from experience and reality that may then lead to a best prediction of the truth, and perhaps even to a new theory. At the same time, it has to be clarified that abductive reasoning is similar to deductive and inductive approaches in so far as it is applied to make logical inferences and construct theories. With the abductive approach, the research process starts with 'surprising facts' or 'puzzles' and is then devoted to their explanation (Kovács & Spens, 2005). A researcher may encounter an empirical phenomenon that cannot be explained by the existing range of theories. The researcher then seeks to choose the 'best' answer from among many alternatives in order to explain the 'surprising facts' or 'puzzles' identified at the start of the research process. Both numerical and cognitive reasoning may be combined. See Fig.3 below.

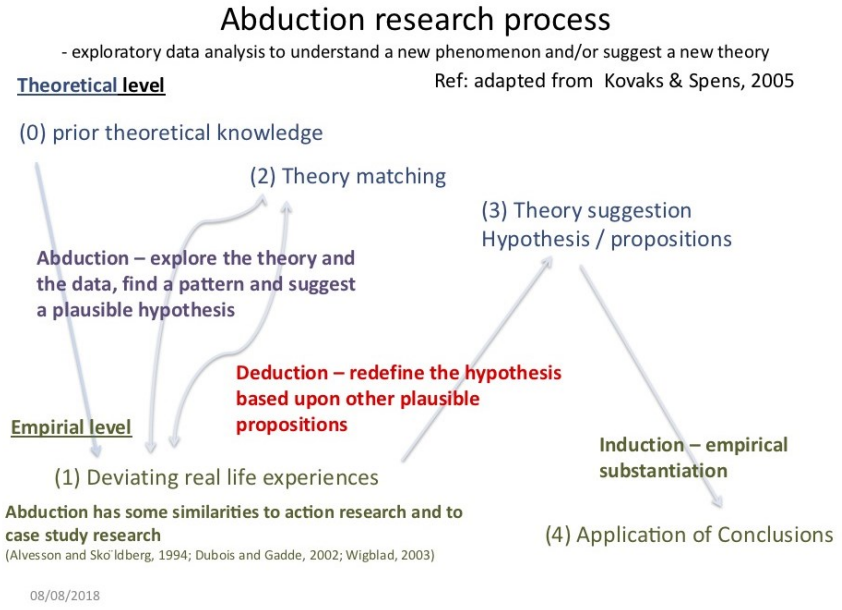

Figure 3: The best of both? – Abduction. Ref: adapted from Kovács & Spens, K.M (2005)

Table 1 below illustrates the major differences between deductive, inductive and abductive research approaches in terms of logic, generalisation, use of data and theory. Further detail is provided in the literature review. While the choice of method should be led by the research question(s) the role of the researcher also changes. For example, hopefully detached and impartial with quantitative methods and able to be objective. Whereas with qualitative methods the researcher tends to be more involved on a personal basis and hence likely to be empathetic.

Table 1: Comparative approaches ref: Dudovskiy (2016)

	Deduction	**Induction**	**Abduction**
Logic	In a deductive inference, when the premises are true, the conclusion must also be true.	In an inductive inference, known premises are used to generate untested conclusions.	In an abductive inference, known premises are used to generate testable conclusions.
From/To	Generalise from the general to the specific.	Generalise from the specific to the general.	Generalise from the interactions between the specific and the general.
Use of data	Data collection is used to evaluate propositions or hypotheses related to an existing theory.	Data collection is used to explore a phenomenon, identify themes and patterns and create a conceptual framework	Data collection is used to explore a phenomenon, identify themes and patterns, locate these in a conceptual framework and test this through subsequent data collection and so forth.
Theory	Theory falsification or verification.	Theory generation and building.	.Theory generation or modification; incorporating existing theory where appropriate, to build new theory or modify existing theory.

2.1 Could better decisions result?

Data collection, analysis and the understanding of research should lead not only to further effective research but also enable managers to take better decisions. Davenport (2009) argues that adopting multiple perspectives, leads to better decisions and robust conclusions, typically overcoming bias and weakness from single method approaches, see Fig 4. It is also important to know when a particular decision approach does not apply. For example, analytics is not a good fit when you have to make a really fast decision. Almost all quantitative models, even predictive ones, are based on past data, so if your experience or intuition tells you that the past is no longer a good guide to the present and future, you'll want to employ other decision tools, or at least create some new data and analyses.

Multiple Perspectives Yield Better Results

Critical to balance decision tools with human intuition & judgement

- Don't use models without understanding them
- Make assumptions clear
- Keep track and manage the models in use
- Cultivate human backup
- Understand the context e.g. analytics not good if a fast decision is needed. Most predictive models are based on past data so is the past a guide to the future?
- Triangulate results – check from different perspectives with different data….

By combining multiple observers, theories, methods, and empirical materials, researchers can hope to overcome the weakness or intrinsic biases and the problems that come from single method, single-observer and single-theory studies.

08/08/2018

Figure 4: Better research leads to improved decisions and results. Ref: Davenport (2009)

3. Literature review

A brief review of mixed methods, the debate regarding quantitative and or qualitative analysis, along with pragmatism follows; as will examples of combining inductive, deductive and abductive approaches. Deductive reasoning can be criticized for a lack of clarity in terms of how to select the theory to be tested via formulating hypotheses. Inductive reasoning, on the other hand, has been criticised because "no amount of empirical data will necessarily enable theory-building" (Saunders, Lewis & Thornhill, 2012). Abductive reasoning, can address some of the weaknesses traditionally associated with deductive and inductive approaches (Dudovskiy, 2016) by adopting a pragmatist perspective.

3.1 Mixed methods and pragmatism

Feilzer (2010) argues for the practical relevance of pragmatism as a research paradigm through the example of crime scenes, criminal data and interpretation in court that not only uses both quantitative and qualitative research methods but also exploits the inherent duality of the data analysed. Thus, Feilzer aims to make the case that pragmatism supports the use of a mix of different research methods as well as various modes of analysis combined with a continuous cycle of abductive reasoning. Dudovskiy (2018) suggests that either or both observable phenomena and subjective meanings can provide acceptable knowledge that is dependent upon the research question. Johnson and Onwuegbuzie (2004) present mixed methods research as complementary to traditional qualitative and quantitative research, and pragmatism as offering an attractive philosophical partner for mixed methods research. They briefly review the paradigm "wars" and incompatibility thesis, and show some commonalities between quantitative and qualitative research. Williams (2007) proposes that researchers collect or analyse not only numerical data for quantitative research, but also narrative data for qualitative research in to address the research question(s). The mixed methods approach to research is regarded as an extension to rather than a replacement for quantitative and qualitative approaches (Johnson & Onwuegbuzie, 2004). The goal for researchers using the mixed methods approach to research is to draw from both the strengths and to minimize the weaknesses of a more traditional single approach.

3.2 Quantitative and qualitative comparisons and the 'paradigm war'

There are many differences and research role differences between the two methods for example quantitative research is deductive while qualitative research is inductive, see Table 2.

Table 2: Paradigm war 2 - quantitative versus qualitative approach

http://www.gifted.uconn.edu/siegle/research/Qualitative/qualquan.htm

Quantitative Mode	Qualitative Mode
Assumptions Objective reality Variables can be identified and relationships measured Outsider's viewpoint	Assumptions Social construction Variables are complex, difficult to measure Insider's viewpoint
Purpose Generalise Predict Causal explanation	Purpose Context Interpret Understand actor's perspective
Approach Begin with hypothesis and theory Use formal instruments Experimentation Deductive Seeks consensus, the norm Abstract language write-up	Approach End with hypothesis and grounded theory Researcher as instrument Inductive Search for patterns Seek pluralism, complexity Descriptive write-up

Lincoln and Guba (1985) believe that quantitative and qualitative research are incompatible, while Patton (1990) thinks that an open-minded researcher should be able to combine both of the research methods. Different research methods allow us to understand different aspects of the world but researchers may conform to the methodology that is most related to their view of the world. These paradigms have totally different assumptions on the nature of the world, deploying different procedures and instruments to gather data (Table 2). Qualitative research is seen as naturalistic as it follows human behaviour. Qualitative methods have many different forms Goetz and LeCompte (1984) refer to it as ethnography. A researcher's perspective directs the type of research questions and methods chosen. It has been suggested that a researcher must pick which paradigm they choose to use, as this paradigm will dictate which research question and methods that they will use in the study; but this statement has been challenged by Goetz and LeCompte (1984) where they think it is not useful to put simple dichotomies on research models. On balance, there seems to be little reason why research methods cannot be combined to produce a more accurate and descriptive study increasing the quality of the research.

3.3 Abduction techniques

This approach has some links to grounded theory and was first popularised by Charles Sanders Peirce (1903) an American philosopher, logician, mathematician, and scientist, who developed thinking on pragmatism.

Mabsout (2015) has argued that a constantly changing social reality means economic theories, even if correct today, need to be constantly revised, updated, or abandoned. To maintain an up-to-date understanding of its subject matter, economists have to continuously assess their theories even those that appear to be empirically corroborated. Economics could gain from a method that describes and is capable of generating novel explanatory hypotheses. A pessimistic view on the existence of such a method was famously articulated by Karl Popper (see Mabsout) in The Logic of Scientific Discovery. He wrote 'there is no such a thing as a logical method of having ideas or a logical reconstruction of this process.' Popper is known for his rejection of the classical Inductivist views on the scientific method, in favour of empirical falsification: A theory in the empirical sciences can never be proven, but it can be falsified, meaning that it can and should be scrutinized by decisive experiments. Herbert Simon responded to Popper and argued the opposite, namely, that there is a model of discovery and its name is abduction (see Mabsout). Hence the topic is contested. Mitchell (2015) and Reichertz (2004) have referred to abduction as a knowledge-extending means of drawing an inference, as distinct from the normal logical conclusion based upon either purely deduction or induction. The idea that abduction can lead to rule governed and replicable knowledge that is increasingly popular in social science. "Just what does Peirce's concept of abductive reasoning comprise?" Chiasson (2001) questioned Peirce use of the terms "abduction" and "retroduction" interchangeably. Chiasson posited that if modern researchers refer to a

deliberate form of overarching methodology incorporating abduction, deduction, and induction; then finding a "best" solution could become a teachable skill.

Chong (1994) proposes that while abduction and deduction are the conceptual understanding of a phenomena, induction is the quantitative verification. At the stage of abduction, the goal is to explore the data, find out a pattern, and suggest a plausible hypothesis with the use of proper categories; deduction is to build a logical and testable hypothesis based upon other plausible premises; and induction is the approximation towards the truth in order to fix our beliefs for further inquiry.

- Abduction is not symbolic logic but critical thinking
- Abduction is not Poperian falsification but hypothesis generation.
- Abduction is not hasty judgment but proper categorization.

Chong further offers this elegant summary: as abduction creates, deduction explicates, and induction verifies.

3.3.1 Examples - the ubiquity of abduction thinking and approaches

Douven (2017) in the Stanford Encyclopaedia of Philosophy suggests a number of examples that demonstrate the variety of applications for abductive thinking. Philosophers as well as psychologists tend to agree that abduction is frequently employed (perhaps without appreciation) in everyday, routine reasoning:

- Our trust in other people's testimony, which has been said to rest on abductive reasoning is one example. This may well be correct, although one does not normally seem to be aware of any abductive reasoning going on in one's mind.
- Similarly, the role of abduction in linguistics where it has been argued that decoding utterances is a matter of inferring the best explanation of why someone said what he or she said in the context in which the utterance was made.
- Scientists have argued that abduction is a cornerstone of scientific methodology referring to abduction as "the inference that makes science." Two examples of this application include:
- When it was discovered that the orbit of Uranus, one of the seven planets known at the beginning of the nineteenth century, departed from its predicted orbit (on the basis of Isaac Newton's theory of universal gravitation); then the assumption was made that there were no further planets in the solar system. Two astronomers, Adams and Leverrier suggested independently, that there was an eighth, as yet undiscovered planet and that this provided the best explanation of Uranus' deviating orbit. Neptune, was discovered shortly after.
- Secondly, discovery of the electron by the English physicist Thomson. He conducted experiments on cathode rays to determine whether they were streams of charged particles. The conclusion that cathode rays consist of negatively charged particles does not follow logically from the reported experimental results, nor could Thomson draw on any relevant statistical data. Nevertheless, he correctly assumed that this was the best and only plausible explanation.
- Abduction is said to be the predominant mode of reasoning in medical diagnosis: physicians tend to go for the hypothesis that best explains the patient's symptoms.
- Finally, abduction plays a central role in philosophical debates on so-called under determination arguments. Under determination arguments generally start from the premise that a number of given hypotheses are empirically equivalent, which their authors take to mean that the evidence is unable to favour one of them over the other.

4. Case Study example of the application of abduction-based research methodology: outsourcing and offshore decisions.

The overall aim of this research was to examine the extent to which the offshoring and outsourcing strategies of German and UK based multinational corporations (MNCs) were embedded in the institutional contexts of their *respective home countries*, and in particular the extent to which this can be explained by the *varieties of capitalism* perspective (Mitchell, 2015). The topic was of interest because many years of teaching executive MBA students at Business School had left the researcher with an impression that UK and German multinationals tackled similar case studies and problems in a rather different way. Furthermore, the use of outsourcing had increased dramatically in the US and UK while German multinationals were continuing to grow globally through controlled offshore expansion while resisting outsourcing. Existing theories did not

adequately explain these differences which run deeper than cultural factors as HQ location and practice had a significant impact on the way overseas subsidiaries behaved.

4.1 Interview protocol

It was intended to develop comparative case studies that mix empirical data with pragmatism to critically compare and contrast the experiences of competitors in each of the UK and Germany. Interviews with senior executives in both headquarters and regional / divisional offices were a prime source of data as they were the key decision and policy makers. It was envisaged that the interview responses ought to be more insightful as a result. Reichertz (2010) suggests that there is a risk that in bringing order to chaotic data collected in interviews, and then fitting that data into a typology, inappropriate analysis will result. In this context, 'chaotic' reflects the assimilation of views from different interviewees, in different business units and /or companies that are expressed over time. Some order and mitigation is achieved by targeting senior managers and following the same questions. Interviewees requested that they be anonymised.

4.1.1 Research Questions

The aim was to explore how businesses decide whether to expand and locate offshore for market growth and development reasons or to take advantage of lower costs than are available in their current configuration. For the participating organisations:

1. What experience do you / the organisation have of either outsourcing / offshoring?
   or
2. Establishing overseas subsidiaries?

This gave rise to a number of sub – questions:

- What was the decision – making process?
- How are the feasibility / cost-benefit studies prepared?
- Did pilot studies take place and how were they tested?
- What consultations / discussions took place with trade unions / works council, at what stage – and what was the outcome?
- If work has moved then has the nature of the work changed i.e. becomes more complex / greater added value – and how has that influenced the cost-benefit case?
- How has the delivery time to market or have the supply chains and distribution channels changed – are there local suppliers, additional storage facilities?
- Has the strategy changed or been revised – and why?
- What lessons have been learnt?

Having tested the questionnaire with early interviews the research questions were then modified as:

RQ1	What are the differences in the geographical, functional and temporal patterns of outsourcing and offshoring?
RQ2	How far do mechanisms such as ownership, control, coordination and the degree of autonomy differ?
RQ3	How is this reflected in divergent international divisions of labour regarding the employment of indigenous or ex-pat managers?
RQ4	To what extent do preferences for cultural proximity affect location?
RQ5	What is the influence of trade unions in the process of outsourcing and offshoring and how is this reflected in the structuring of the firms' labour markets?
RQ6	What evidence is there, and why of a reversal in policy – re-shoring?

4.2 Access and respondents

Contacts were initially made through the researcher's personal network who then recommended subsequent interviewees. A 'snowball' sampling technique was used. This is a non-probability sampling technique used to identify potential interviewees through referral when subjects would otherwise be hard to locate. The two engineering businesses in Germany and the UK had a specific headquarters, whereas the two airlines have a

number of major offices representing different parts of the business. Candidates were selected to represent both strategy development and policy making as well as line management and implementation at an operational site level.

4.3 Underlying theory and approach

Theoretical framework is primarily assessed through the *'varieties of capitalism (VoC)'* perspective, Hall and Soskice (2001). Additional relevant economic theory was drawn from *'global production networks (GPNs)*', Coe, Dicken and Hess (2008). and the '*resource-based view of the firm (RBV)'*, Barney (1991). *Institutional effects / embeddedness* the influence of actors, decisions and policies, social structures and resource scarcity acting as constraints also needed to be addressed, Granovetter (1985), Grabher (1993), Hess (2004) et al. Two comparative case studies were developed for the Airline sector and the Engineering sector. In each case a leading UK and German company were compared and contrasted. The overall approach is summarised in Table 3 below using the format established earlier in Fig.1. A brief outline is included below of the methodology, the initial hypothesis and the subsequent findings based on the use of induction, deduction and abduction analysis. The resulting propositions were then further explored to develop conclusions.

Table 3: Selected Combination of Approaches ref: Mitchell, 2018 (adapted from Saunders)

Criteria	Selection
1. Philosophy	**Pragmatism** – combining positivism and interpretivism.
2. Approach	A combination of deductive and inductive. **Abduction** will also be deployed.
3. Strategy	**Multiple case studies** that are paired by sector with multinational corporations MNCs who are significant market players. To support the case studies some additional secondary data and / or research of archive material will be required to triangulate the findings.
4. Choice	**Multi-method Qualitative plus some Quantitative** (financial reports, employees, fleet size, factories etc).
5. Time horizon	**Cross sectional** with some historical perspective to current time.
6. Techniques & procedure	**Semi structured interviews**, recorded transcripts, analysis using a mixture of *quantitative and* (mostly) qualitative techniques, supplemented with additional secondary data collection.

The core underlying theory is known as Varieties of Capital (VoC) and the starting proposition here is that UK and German headquartered firms will behave differently largely in accordance with national characteristics and constraints. While a number of the ideas embedded in this theoretical concept have been criticised it is felt that the theory as a whole is sufficiently compelling that it can be central to our understanding of why German and UK companies compete and behave in rather different ways.

The UK is widely regarded as a 'Liberal Market Economy', while Germany is best characterised as a 'Coordinated Market Economy'. Hall and Soskice (2001) further suggest that countries with a high stock market profile tend to offer less labour protection (e.g. LME) than CMEs (e.g. Germany) where the agencies and institutions will adapt differently to sudden changes or shock thus leading to different corporate strategies, levels of innovation, employment practices and income distribution.

It is suggested that a UK company is likely to be dominated by a CEO with strong performance incentives linked to share price. The UK model is largely shareholder driven and regulated by the equity market that has dispersed ownership. The labour relations system implies that bargaining is typically at the level of the firm, union membership is not compulsory and that a formal voice influencing corporate decision-making would be unusual. Inter-firm relations are more likely to be competitive then collaborative. Employment is of general rather than specialist skills. Corporate policies will favour deregulation and seek to reduce tax. However, German companies, are governed by non-market institutions where ownership is in the hands of long-term strategic actors with multiple links. There is a corporatist system of employee representation giving formal participation rights at both plant and company level. Also, there is a dual company board system with the Vorstand reviewing day-to-day running of the business and the Aufsictsrat (supervisory) board addressing strategic decisions, capital investment, mergers and dividend policy. A German company is typically

characterised by consensus decision making balanced by multiple goals, and strong representation of employees (through works council etc.) who could block, or moderate the pace of corporate change. Hence it is stakeholder driven. The emphasis is on strategic interplay, differentiated niche production and the acquisition of industry relevant skills through apprenticeships. See Fig 5 below for how the research aims, the literature and the underlying theory are linked to form a conceptual framework and typology suitable for data analysis. The research questions relating to differences in approach and choice of location, ownership and coordination, employment practice, cultural proximity is set out in column 1 of Table 4. The approach and relevant dimensions in columns 2 and 3. Columns 4 and 5 summarise the hypothesis for how UK (LME) as opposed to German (CME) multinational companies would answer the questions.

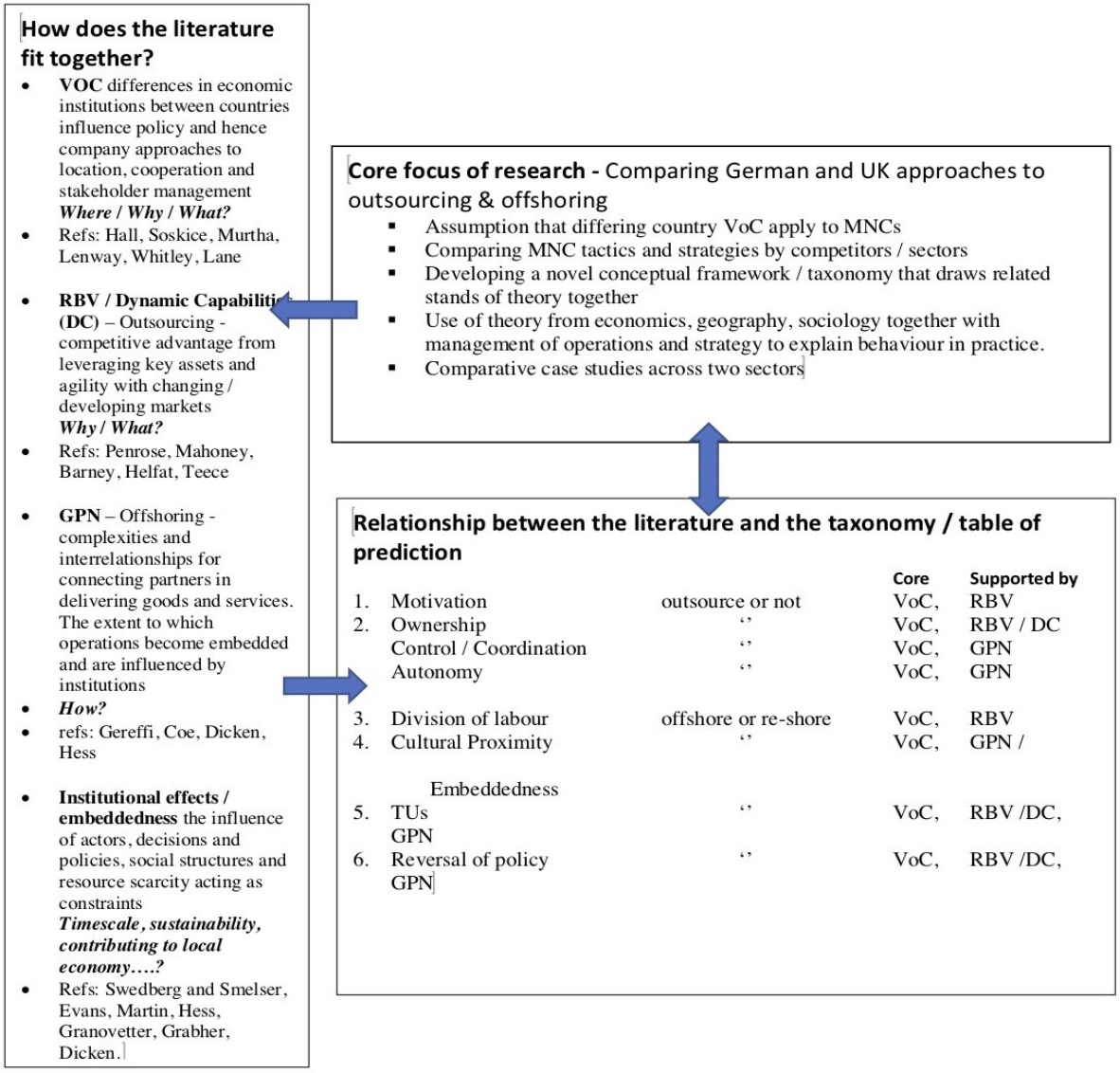

Figure 5: Linking the aim, theory and taxonomy for a conceptual framework ref: Mitchell, 2015

Table 4: Taxonomy – theoretical projection of the hypothesis (author)

Indicative extract only for brevity

Research Question	Approach	Dimensions	Liberal Market Economy (LME) predictions	Coordinated Market Economy (CME) predictions
1. What are the differences in the geographical, functional and temporal patterns of outsourcing and offshoring?	Outsource	**Motivation**	• Cost cutting and employee reduction • English speaking countries • Traditional trading zones	• Quality and performance, cost control is 'a given'. • Central / Eastern Europe preferred
2. How far do mechanisms such as ownership, control, coordination and the degree of autonomy differ?		**Ownership**	• Shareholder driven	• Multiple stakeholder
		Control & Coordination	• Arm's length on strategy. Strict cost and budget control	• Tight HQ control of strategy, policy and resources
		Degree of autonomy	• High – if meet financial targets then local control	• Low • Hierarchical structure • Can be slow to respond to change
3. How is this reflected in divergent international divisions of labour regarding the employment of indigenous or ex-pat managers?	Offshore	**Managerial Division of labour**	• Low initial use of ex-pat managers who then stay on	• High initial use of ex-pat managers for set-up and training. Subsequently local management
4. To what extent do preferences for cultural proximity affect location?		**Cultural Proximity**	• Low, flexible, opportunistic	• High – language, behaviour.

Through the application of abduction techniques, it is hoped to develop a series of propositions from the findings that in turn can help to develop conclusions. Abduction is essentially a search for some meaningful rules that will offer a valid explanation, while removing what is surprising about the facts. This results in a set of predictions (could also be regarded as a hypothesis). Three steps were followed:

Step 1: Develop a novel conceptual framework based on a taxonomy of criteria that help to explain outsourcing and offshoring behaviour (Table 4 above). This '*abduction*' provides a focus, to commence research and testing and is a useable re-construction of the predicted outputs from the research (the hypothesis).

Step 2: Derive predictions from the hypothesis (*deductions*) these are where the researcher reflects upon answers to the interview questions for the airlines case study and for the engineering case study (see Tables 5 & 6).

Step 3: Search for evidence that will verify the assumptions (*inductions*) that are the propositions summarised in Table 7 below. These propositions are the further developed and lead to Conclusions.

4.4 Data collection

Fourteen interviews (including follow-up meetings) with senior executives, responsible for policy and strategic decisions were held over two phases with the case study companies. The interviews were held with business units from the four companies in the UK, Germany, India, Poland and the Czech Republic. The relatively small sample of interviews was not considered a limitation as the same questions were asked of executives with a high level of seniority, experience and involvement with outsourcing / offshoring policy.

Tables 5 and 6 represent an initial analysis of the interview data. The headings of focus, approach and issues were cross-checked against each of the six research questions and the predictions shown in Table 4 for LME (the UK airline and engineering business) and similarly, the CME (the German airline and engineering multinationals). Differences between the two sectors were also examined. Repeat interviews were then held with each of the four partner companies, with follow-up questions probing factors that were not totally clear, and further data required.

Table 5: Summary of initial findings in the transport sector.

Focus, Approach and Issues – Airlines Ref: Mitchell, 2015

	UK	Germany
Focus	Non-core processes / activities and business processes may initially be outsourced and moved offshore. Strategic partnerships and diverse business, free to trade with third parties. Airline maintenance, as above, but restructure alongside major productivity improvement studies. Reverse outsourcing when capacity is freed. Catering – single source then prepared to multi-source once lessons learnt.	Largely two pronged: Initially, non-core processes / activities e.g. revenue accounting. Consolidation, centralisation and restructuring. Secondly, Engineering and maintenance - Business processes. Specialist skills & use of temporary contract employees. Own catering business, grown through acquisition from competitors. Offer third party contracts (to UK competitor). Loss making for many years until turnaround in 2007-8
Approach	Internally contract driven led by procurement. Cost cutting is key – but may be material rather than labour cost dependent so location independent. Willing to develop and spin off the business. Spread risk with different providers. Major concern over high pension costs and number of full time employees. Use open book accounting and will exploit tax incentives.	Wholly owned legal entity is preferred. There is a selective choice of countries that are to be a preferred partner. Target improvements in cost reduction, efficiency improvements, common IT systems. Keep the office and staff small – this may avoid works council Issues. JVs are by exception – major supplier / customers.
Issues	Productivity improvements – free up capacity so can reverse decisions to outsource when appropriate. Best value / cost of service Maintain control but encourage suppliers to add value – loose / tight control. Procurement / Contract led with specialist legal, HR, Finance support as required.	Nearshore on a regional basis. Use consultants to build a business case. Avoid conflict with TUs. Added value still from Germany. Locations common to shared services (clusters). Providers' benchmark and exchange of ideas. Big local skilled cheap workforce. Improvements kept in-house not shared with alliance partners (to date). Big benefits in man hour rates. Tax incentives are not always exploited.

Table 6: Summary of initial findings in the engineering sector.

Focus, Approach and Issues – Engineering Ref: Mitchell, 2015

	UK	Germany
Focus	Start off with basic cost cutting and outsourcing – become more ambitious with offshoring. The aim is to improve return on sales and survival.	Moving important but non-core business services and processes offshore. Cost reduction still a key driver. Create specialist subsidiary business and carefully track target cost savings. Co-ordinate and control inter-group business globally.
Approach	Grow through partnership, alliances and then acquisition. Integrate to gain further cost reductions and then revisit outsourcing offshore. A continuous drive. Seek external consulting help when appropriate.	Cost driven – approach varies by group division. Wholly-owned subsidiary established. Close cooperation with institutional partners. Avoid outsourcing – control over product. Established over a 20-year period. Rapid growth in past three yrs. To reduce over reliance, further expansion shifted from India to Vietnam.
Issues	Shift from cost reduction to value add, efficiency and service delivery. Care taken with choice of preferred country destination for relative ease of working / cultural fit for offshore activity. Careful monitoring and reporting of actual v target performance. Politics, local policies and fiscal breaks all play a part but may be time limited. Have to work hard to recruit good people – even in a recession.	Timing of cost reductions coincident with global growth – so protection of jobs in home market. Customer pressure for lower costs and supply nearshore in key markets. Avoid outsourcing to retain control. Sensitive to cultural differences and market sensitivity. Little networking – collaboration is between OEMs and first level supplier. Young workforce, extensive training. Strict monitoring of cost savings.

4.5 Linking findings to propositions

From the findings and analysis, a detailed comparison of Table 4 with the 'actual' results was undertaken following a process of abduction, deduction and induction to derive propositions as in column three of Table 7 below. In developing two case studies, abduction thinking was key to explaining the empirical phenomenon relating to competition in the airline and engineering sectors; and in particular how UK and German

multinationals developed different approaches to outsourcing. The first two columns summarise the key findings for the two cases (questions 1-4 only as examples) the third column is a resulting proposition for the two cases combined. Each proposition in Table 7 (abridged) was summarised, verified or otherwise, by repeated iterative searches of the interview and secondary data, consistent with the abduction process and finally extended as an evidence-based conclusion. This included noting contradictions and idiosyncrasies.

As a final check on the methodology and the 'robustness' of the findings, a further series of interviews were held with Swiss and US based MNCs with subsidiaries in China. The China based operating companies again held practices and followed corporate polices from their Swiss and US headquarters that conformed to CME and LME principles as in the core case study participant organisations. This supported the findings from comparing UK and German multinationals.

Table 7: Development of propositions ref: Mitchell,2018

Indicative extract only for brevity

Case Study 1 - Airlines	Case Study 2 - Engineering	Proposition
1. **Motivation** – is primarily cost in UK with a focus on outsourcing support or back-office processes. In Germany while cost is significant it is not given the same over-riding priority; more concerned with central coordination of shared activities (e.g. Krakow) that can then be replicated around the world.	1. **Motivation** – outsource non-core activity locally in the UK, offshore to China and India (less keen). For German company offshore but retain ownership in a range of key international markets. Long-term development of embedded software products (India) and new platforms (Czech Rep). Driven by local expertise as well as cost.	1. Cost control is a key consideration in both sectors with UK and German companies. Coordination from HQ and a replication of shared services is important for both the German airline and the engineering company. Market development and local expertise is also important for the German engineering business. Both sectors seem to be consistent with the country VoC hypothesis.
2. **Ownership** – willingness to offshore and outsource in UK, reluctance to outsource by the German company who wish to retain ownership but at a lower cost.	2. **Ownership** – UK flexible with an initial willingness to offshore and outsource, only retaining control following a loss of IP. Reluctance to outsource in Germany contact with OEM through HQ.	2. In both sector cases, the UK companies were open to outsourcing and progressive offshoring; they were also flexible and prepared to divest, start joint ventures or acquire when circumstances changed. Reluctance to outsource from both German companies but willing to take lower costs from moving offshore if control is retained. Outsourcing in Germany however, remains on the agenda as further productivity improvements are demanded. Recent evidence of outsourcing IT systems at Lufthansa to IBM.
3. **Control & Coordination** – both outsource and move offshore from UK a significant role played by Procurement and contract management. In Germany tight control from HQ.	3. **Control & Coordination –** shareholder value a priority in UK, retaining control as an offshore subsidiary is important in Germany.	3. Procurement and Contracts drive the operational changes in the UK airline. Performance measures and SLAs are regarded as part of achieving budget in UK but the business is left alone to meet targets. German operations, are more constrained and have fewer 'degrees of freedom' they must consult with HQ on delivery.
4. **Degree of autonomy** – relatively loose in UK, high autonomy and flexible, tight in Germany but relaxes with trust over time and preference to near-shore.	4. **Degree of autonomy** – relatively loose in UK. Tight central control of design in Germany also close budget monitoring.	4. As suggested above – consistent with LME (loose) and CME (tight) styles for the UK and Germany respectively.

5. Conclusion

For this case study research, mixed methods applying abductive thinking was found to combine numerical and cognitive reasoning that led to a 'best answer' to data that otherwise could not always be adequately explained and contained a number of ambiguities. The predictions were largely found to be accurate, with UK and German based companies, in both sectors, conforming to LME and CME models respectively; some characteristics were nuanced.

- A process of abduction, deduction and induction helped to derive the propositions in column three of Table 7.
- Abduction thinking was key to explaining competition in the airline and engineering sectors; and in particular how UK companies were prepared to outsource and monitor operations closely, while German companies retained control through offshore subsidiaries. Abduction also enabled a rigorous search of the data, testing ideas, checking and trying to understand differences in interview responses under a variety of differing circumstances; in short what actually happened in practice and the reasons why.
- The detailed findings were found to be of practical use to managers in complex multinationals developing and implementing their strategy, also in understanding why their own organisation as opposed to an international competitor follow rather different paths given similar industry challenges.
- For students, researchers and academics the conceptual framework and taxonomy developed during this mixed method research proved to be a useful template for predicting how organisations might operate in practice and pulled together differing theoretical constructs.

The purpose of this paper was to propose that mixed methods research is complementary to traditional qualitative or quantitative research, also that pragmatism is an attractive philosophical partner for mixed methods. A key feature of mixed methods research is that methodological pluralism can lead to superior research. The research question of whether 'pragmatism' as a philosophical choice to combine positivism and interpretivism can lead to an appreciation of 'what works' in practice, has been addressed through multiple case studies of complex MNC's. It is hoped that this will encourage further research and more papers deploying mixed methods techniques. Researchers, especially those at PhD or early post doctorate level should not feel constrained by traditional paradigms of research methods, although they may need to invest some time persuading their supervisors of the value of mixed methods.

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