Submitted to Industrial Marketing Management 15th April 2015; Resubmitted 20th October 2016; 20th March 2017; 21st June 2017, 4th July 2017

Managing to Make Markets:
Marketization and the Conceptualization Work of a Strategic Net in the Life Science Sector

ABSTRACT

This paper presents one of the first studies to identify and explain the marketization work of a strategic net. Through a study of the Stevenage Bioscience Catalyst – a strategic net formed to support the marketization of Life Science Discoveries - we generate insights into the everyday work that makes marketization happen. Marketization is understood as the process that enables the conceptualisation, production and exchange of goods. Our findings focus on one specific form of marketization work found to be core to the strategic net: *conceptualisation work*. Three forms of conceptualisation work are identified: conceptualising actors' roles, conceptualising markets and conceptualising goods. These manifest as routinized, recursive practices. Our analysis reveals how these practices gather together multiple forms of scientific, technical and market knowledge to generate new market devices that transform market rules and conventions, and introduce new methods and instruments of valuation that change the market. In contrast to extant studies that claim a strategic net's activities influence markets; our findings position the *conceptualisation work* of the strategic net as constitutive of markets and the broader system of provision for 'healthcare' and 'health futures'.

Key Words: Conceptualization Practices; Conceptualization Work; Marketization; Work; Strategic Nets; Systems of Provision

1. INTRODUCTION

When technologies advance and innovations emerge, firms collaborate to generate new markets to accommodate them (Aarikka-Stenroos & Sandberg, 2012). In this paper, we ask: w*hat kinds of conceptualisation work are performed by a strategic net to bring about changes to markets and their broader systems of provision*? Strategic nets have been described as intentionally formed networks created for a specific strategic purpose (Möller & Rajala, 2007). This literature suggests that managers develop strategic nets to collectively re-imagine, co-ordinate and manage change (Adner & Kapoor, 2010; Möller & Halinen, 1999; Möller, Rajala, & Svahn, 2005). Möller and Svahn (2006) draw on the industrial networks (cf. Håkansson & Waluszewski, 2002), strategic management, dynamic capabilities and organisational learning literatures (cf. Zollo & Winter, 2002) to argue that strategic nets differ in their governance from other forms of network because they constitute deliberate efforts to learn how to create value collectively: the more uncertain the value creation system, the more demanding the management of the network. In other words, uncertainty - and hence the demands on managers - increase when technological understanding advances beyond the experience of markets (Knight, Pfeiffer, & Scott, 2015). Thus, managers need to develop capabilities that bridge different *communities of practice* (Lave & Wenger, 1991) - connecting specialist forms of technical and professional knowledge - to generate new and more holistic forms of knowing and acting (Möller, 2010). In this regard, understanding how markets are collectively conceptualised and represented seems central to understanding how strategic nets set agendas and work out how to act. Yet the strategic nets literature says relatively little about these practices and processes. To understand more we turn to the marketization literature.

Marketization has been defined as the process that enables the conceptualisation, production and exchange of goods (Araujo & Pels, 2015). In the marketization literature, researchers cite efforts to transform market structures, introduce market devices, alter market behaviour, and reconstitute market agents as the outcomes of coordinated efforts of actor-networks (Doganova & Karnøe, 2015; Kjellberg, Azimont, & Reid, 2015; Onyas & Ryan, 2015). They recognise that to transform and innovate markets, actors must work to create new market rules and conventions, and valuation methods and practices through the introduction, presentation and circulation of new forms of scientific, technical and market knowledge (Çalışkan & Callon, 2010). While, traditionally, the marketing literature has focused on enabling exchange between buyers and suppliers, explaining how managers align product characteristics with customer demands (Baker & Sinkula, 2002) and persuade unknowing potential market actors to value innovative offerings (Jaworski, Kohli, & Sahay, 2000), exchange is only a part of the marketization process. A focus on exchange neglects the both the conceptualisation and production work needed to constitute, innovate and reconfigure market systems, and the broader system of provision configures connections *between* markets (Fine, 2002).

We argue that there are strong complementarities between the strategic nets literature, which makes use of concepts such as capabilities, learning, activities and managing in networks (see, Knight et al., 2015; Möller & Rajala, 2007; Möller et al., 2005), and the actor-network-theory informed marketization literature which explicates the unfolding practices and materialities that constitute markets (see, Araujo, 2007; Kjellberg et al., 2015). Yet these two bodies of literature are relatively silent on the work done to conceptualise and represent markets and their broader systems of provision (see Möller, 2010; Pollock & Campagnolo, 2015 on agenda setting and matrix building respectively as a notable exception). By bringing these literatures into dialogue, we are better

equipped to explore how managers collaborate across organisational boundaries, work strategically and manage to conceptualise and make markets. As Möller (2010: 369) observes, *"more empirical insights are required of the practices that companies are using in agenda construction and communication. This is an urgent issue…".* Indeed, we know little of the material artefacts that are implicated in this work or how this work becomes transformative for the way markets are performed.

In this paper, we represent findings from an eighteen month study of *marketization work* of a strategic net - the Stevenage Bioscience Catalyst (SBC) - in a Life Sciences context, where the focus is on conceptualising and producing goods from living organisms for medical interventions for improved healthcare outcomes (cf. Magner, 2002). In such contexts, there is clear potential for deliberate, purposive and strategic interventions for market transformation (cf. Harrison, Holmen, & Pedersen, 2010). In this paper, we understand *work* to be the strategic and deliberate practices performed by market actors to shape markets (Cochoy & Dubuisson-Quellier, 2013); and *practices* to be the "routinized way in which bodies are moved, objects are handled, subjects are treated, things are described and the world is understood" (Reckwitz, 2002: 250). Drawing on both the marketization and strategic nets literature, we conceptualise and explain the work SBC does to reimagine and make markets. We refer to this particular form of marketization work as *conceptualisation work*. Adopting a performative view, we study how SBC disrupt and problematize extant market practices through the conceptualisation work that they do. In so doing, we identify the disruptive conceptualisation practices that transform market practices and devices.

2. LITERATURE REVIEW

2.1 Strategic Networks & Strategic Nets

Strategizing in networks and the formation of strategic networks has been widely discussed in the marketing and management literature. Networks set up with a specific strategic intent have been referred to as networks of innovation (Chesbrough, 2006; Freytag & Young, 2014; Leydesdorff & Meyer, 2006), business ecosystems (Rong, Wu, Shi, & Guo, 2015), value nets (Parolini, 1999) and strategic nets (Möller & Rajala, 2007). Möller and Rajala (2007) describe the phenomena of *emerging strategic nets* as a value system *in-the-making,* that calculates what is of value and to whom. In the biotech context, the value of science is not always apparent and, if it is, may not be realisable because of technical kick-backs, molecular technology misfires or other risks in the innovation process (cf. Callon, 1991; Fernald, Pennings, & Claassen, 2015; Rong et al., 2015). While not investigating the process of marketization specifically, this body of work provides in-depth insights into the role and the management of strategic networks for the commercialization of science.

An important theme in the strategic networks literature is the relationship between strategic networks and the commercialization of science. In this literature commercialisation is understood as the exploitation of scientific invention with the objective of reaping financial regards (Perkmann et al., 2013). For Chiesa and Frattini (2011) many of the challenges in commercialization emerge from the novelty of innovations which complicate the adoption of new solutions and raise adoption barriers. For other scholars it is the capacity of firms to develop and manage innovation without strategic networks that presents a problem (Aarikka-Stenroos & Sandberg, 2012; Story, Hart, &

O'Malley, 2009). In a recent review paper, Aarikka-Stenroos et al. (2014) develop a framework capturing the role of networks in the process of commercialization, showing how the indirect and unintentional contributions of actors support the creation of markets for innovations.

Some scholars arguing for the deliberate and strategic development of such networks have referred to them as *ecosystems,* describing them as *"a group of companies – and other entities including individuals…. - that interacts and shares a set of dependencies as it produces the goods, technologies and services customers need",* (Zahra and Nambisan 2012: 220), and *"an independent economic community with different stakeholders, including direct industrial players, government agencies, industry associations, competitors and customers, who mutually benefit each other and face similar outcomes",* (Rong et al 2015: 294). Rong et al. (2015) describe the efforts of a UK-based microprocessor innovator to enter the Chinese market, where high product uncertainty and limited network resources presented significant barriers to action. By incubating complementary partners, identifying lead partners and integrating other ecosystem partners, the firm developed a working ecosystem operating across multiple Chinese markets to constitute a system of provision situated in China. A key point here is the recognition that for science to be commercialised and for innovation to be successful, the broader system of provision that is constituted by many and varied inter-related markets, needs to be taken into account and *managed* in some way.

These definitions of strategic networks and ecosystems, have similarities with Moller and Rajala's (2007) conceptualisation of strategic nets. For Möller and Rajala's (2007) strategic nets are understood as an intentionally formed network, created for a specific strategic purpose and incorporating a finite number of members. We adopt this definition of strategic nets in this paper. This conceptualisation enables us to focus our study on common interests and the valuable technical and market knowledge that underlies collaborative moves. As we have seen, strategic nets are understood to contribute towards the creation of entirely new business fields and markets (Möller, 2010; Möller & Svahn, 2009), and provide a focal point of resources, required for commercialization (Aarikka-Stenroos & Sandberg, 2012). Two pertinent issues are consistently foregrounded in association with strategic nets: their structure and management.

The structure of strategic nets has been subject to extensive research attention. Harrison, Holmen and Pedsen (2010) describe different forms of strategic net initiatives, including building a strategic supply network and developing a market entry strategy. Similarly, Möller et al. (2005: 1277) argue that strategic nets are not necessarily confined to 'horizontal' or 'vertical' relationships; where horizontal relationships take the form of competition alliances; resource and capability development alliances; market and channel access/cooperation alliances; ''networking forums''—company or institutionally driven. And vertical relationships take the form of supplier nets, channel and customer nets and vertically integrated value systems. Strategic nets may also be multidimensional, taking the form of complex business nets that require the knowledge and developmental capabilities of multiple actors. Importantly, the value-creating characteristics of these networks require distinct managerial capabilities (Möller & Halinen, 1999; Möller & Svahn, 2006).

The managerial work performed in strategic nets, though widely recognised as a pertinent and pressing topic, has received surprisingly little empirical attention. Möller's (2010) theoretical exploration of the managerial work done in strategic nets, considers the role of sense-making and agenda construction in emerging business networks. In so doing, the focus of this study is on

'management cognition' (what managers think, how they make sense of position and resources, and culture and cognition), rather than what managers routinely do in strategic nets. However, while not making explicit reference to routinized management practices, there is some acknowledgement of the patterned activities associated with the sense-making work performed within the strategic net.

Möller's (2010) argument is an important one. In the complex globalized settings within which many of these emerging networks evolve, there are particular challenges for managers working across diverse national backgrounds which increase the cognitively-based risk of misunderstanding and conflicts. This argument could easily be extended to complex and complementary biotech, robotics and digital health fields – where misunderstandings can cause conflict. Conflict often leads to innovation failure (Li, Karakowsky, & Lam, 2002; Möller & Svahn, 2004). In a move towards observing what managers do (rather than what they think and understand), Möller and Rajala (2007) explain how emerging strategic nets combine old and new actors, introduce radical changes in value activities and are uncertain about both the value of activities, the activities needed, and the actors that should be involved. However, they do not explicate what Managers do to develop and circulate scientific and technical knowledge within and beyond their strategic net; they do not discuss how market knowledge informs the collective action of the strategic net, or its power to transform the market. If we are to see how a strategic net develops practices that disrupt and reconfigure markets, we need to explicate the work a strategic net does to develop and circulate market and scientific knowledge, and to see how this information is used to alter market arrangements.

2.2 Marketization

The process of marketization has been explored through different perspectives. In politics, marketization refers to the "process of taking goods and services that have previously been provided under bureaucratic, political or professional means of resource allocation and transferring them to market arrangements" (Crouch, 2009: 880). In Science and Technology Studies (STS) marketization has been understood as the specific form of economization[1] concerned with the making and shaping of markets (Çalışkan & Callon, 2010) and is closely associated with innovation: both of the goods themselves and of the institutional arrangements made to enable their exchange (Çalışkan & Callon, 2009; Callon, 2008; Callon & Muniesa, 2005). While the definition used in politics is certainly relevant in the context of health markets, we adopt Çalışkan and Callon's (2010) definition to explicate the process of transforming health markets through innovation in the Life Sciences.

Çalışkan and Callon (2010: 3) describe marketization as the "…entirety of efforts aimed at describing, analyzing and making intelligible the shape, constitution and dynamics of a market socio-technical arrangement". In this definition, the market is understood as an organising system for the conceptualisation, production and exchange of goods, constituted through an arrangement of heterogeneous human and non-human actants (cf. Latour, 1986; Latour, 2005). Human actants include managers, scientists, sales personnel, for example. Non-human actants include animate objects (organisms, molecules), epistemic objects (regulations, market representations), technical objects (conference facilities, laboratories, computers). The power of actants to configure and

[1] Economization has been defined as the divergent and controversial analyses, (crossing disciplines such as economics, sociology and anthropology) that define, explain and enact economic forms of life (Çalişkan and Callon 2010).

coordinate the practices of the market emerges from the associations made between them: for example all the forms of knowledge, expertise and materials that come together to deliver a healthcare market (cf. Zuiderent-Jerak, 2009). These associations are often created by equipping market actors with the market devices that help them qualify, calculate and compare the value of goods. Karpik (2000), for example, shows how the Michelin guide was designed to "remov[e] the unexpected in the discovery of the unknown", providing advice that was more credible and legitimate, and equipping consumers to make judgements about where to stop and eat on their journey (cited by Cochoy & Dubuisson-Quellier, 2013: 5).

Market devices thus play an important role in market transformation and innovation. Muniesa, Millo and Callon (2007: 2) describe market devices as 'the material and discursive assemblages that intervene in the construction of markets'. They cite a variety of examples from analytical techniques to pricing models, from purchase settings to merchandising tools, trading protocols and aggregate indicators to illustrate the breadth of market devices as objects that are picked up and used in practice to shape what markets become, and how they are performed to transform a market. In his description of the introduction of the shopping trolley, Cochoy (2009) shows how shoppers, once equipped with this new market device, no longer calculate what they should buy using their shopping list, but rather by how much they can fit into the trolley. The trolley, as a market device, transformed what shoppers are and can do. Similarly, in the shipping industry, the introduction of containers as standardised shipping containers transformed how business customers calculated (Levinson, 2016; Notteboom & Rodrigue, 2008).

Market devices can be technical objects (such as the shipping containers) or can be abstract conceptualisations of markets or analytical tools. In their paper, *'Give me a two-by-two matrix and I will create the market'*, Pollock and D'Adderio (2012) describe how the 'format and furniture' of a matrix created to describe key players in an IT market, come to mediate and constitute a particular market domain. They see the IT market as being a product of the affordances and constraints of ranking devices and argue that material things (including market representations) and the economy mutually constitute one another. Pollock and D'Adderio (2012) take affordances to be the qualities or properties of an object that define its possible uses or make clear how it can or should be used. These associations between market devices and the work that actors do to perform markets create what Muniesa et al. (2007: 3) describe as 'an agencement…constituted by fixtures and furnishings, by elements that allow tracing lines and constituting territory.' Yet we know very little of how market devices are generated or replaced in practice, and more specifically through the deliberate and purposive work of strategic nets. We need to do much more to understand the work done to create new market devices and how they are effectively inserted into the world to shape what markets become. Understanding this process is likely to generate much greater insights into how managers manage to *'trace lines'* that come to constitute a new market '*territory'*.

Cochoy and Dubuisson-Quellier (2013: 4) describe the strategic and deliberate work done by market actors to produce market devices and shape markets as *marketing work*. Marketing work shapes markets and the judgements made by market actors through the development and circulation of market devices. They position marketing work as being part of "… a related market where professionals and knowledge compete …. to be acknowledged as a legitimate market representation." This work can both intervene in markets to transform them, or stabilise markets through, for example, setting market rules and conventions, developing methods and instruments of

valuation, organising property rights, and developing and circulating scientific, technical and market knowledge (Çalışkan & Callon, 2010; Kjellberg et al., 2015). In this sense, markets are the settings in which the arrangements for exchange are continually worked out (Loasby, 1999) and are re-produced through their performance. This unfolding process sees markets as always in the making through the ongoing conceptualisation, production and exchange work that market actors do (Araujo, 2007).

This understanding of markets and marketing work departs from the neoclassical view that focuses purely on exchange (Buzzell, 1999; Sheth, Gardner, & Garrett, 1988) and instead looks at the broader practices that constitute market creation and transformation (Araujo, Kjellberg, & Finch, 2010; Callon, 1998a; Callon & Muniesa, 2005). However, much of the work on marketization is conceptual (Araujo, 2007; Çalışkan & Callon, 2010; Callon & Muniesa, 2005; Kjellberg & Helgesson, 2006). Empirical studies are necessarily partial and tend to focus on how particular arrangements for exchange are achieved (Finch & Acha, 2008; Kjellberg & Helgesson, 2007), how particular innovations in goods transform market arrangements (Harrison & Kjellberg, 2010), or how particular arrangements become powerful in configuring customers (Cochoy, 2015). These empirical studies have far less to say about the imagining, designing, and making-real of markets as discussed by their conceptual counterparts. To do this, we need to study the theoretical and practical, expert and lay knowledge, know-how and skills developed and mobilized in the process of designing and managing into existence new socio-technical arrangements that become broadly accepted by a community as a market.

2.3 Towards an Analytical Framework to Explore the Marketization Work of Strategic Nets

Our review of the strategic nets literature suggests that managers work purposively and strategically to bring about business field and market change (Jaakkola, Möller, Parvinen, Evanschitzky, & Mühlbacher, 2010; Möller, 2010). Yet despite the valuable contribution, we know little about the marketization work performed by strategic nets. Looking at the strategic nets literature through a marketization lens, taking for example the work of Möller (2010: 369), then 'agenda construction' and 'agenda communication' might be additionally understood, not just as sensing making devices but as calculative, market device come to perform markets. That come to shape what is communicated and how. While Moller's (2010) work is largely conceptual, we see the potential here to explicate these and other constructs drawn out in the strategic nets and networks literature to enable us to identify the powerful relations between them that come to constitute markets. Thus, if we understand marketization to be the process that enables the conceptualisation, production and exchange of goods (Araujo & Pels, 2015), then, we argue, strategic nets must be engaged in at least some elements of this work, with the purpose of transforming markets. To understand the work done by strategic nets to engage in the marketization process we would need to know more about the practices routinely engaged in to bring about changes in specific elements that perform the market – i.e. the market devices used to perform the market (Muniesa et al., 2007; Pollock & D'Adderio, 2012). Specifically we would need to show how market rules and conventions, the development of methods and instruments of valuation and the circulation of scientific, technical and market knowledge are transformed through the work of the strategic net, and then inserted into the worlds of other market actors to transform the way they perform the market (Çalışkan & Callon, 2010). We might reasonably expect that such market devices connect and cut across markets to reshape the broader system of provision (Fine, 2002). Finally, we might usefully work abductively

between the networks literature and our data to see what phenomena, constructs and meanings might usefully explain our observations so that we are better positioned to explain the unfolding marketization process we observe.

In looking for possible sites of inquiry we engaged with a strategic net that was formed with the specific purpose of innovating markets to transform the broader system of provision for healthcare. We used this as the focus of our study. So while broadly we set out to understand, *what kinds of conceptualisation work are performed by a strategic net to bring about changes to markets and their broader systems of provision*? More specifically, we ask: 1) *What kinds of conceptualisation practices does the strategic net perform to generate new and disruptive market devices?* and 2) *How do conceptualisation practices influence particular markets and the broader system of provision?*

Figure 1 summarises our argument into an analytical frame which we use to explore the Stevenage Bioscience Catalyst case. The following section introduces and describes the Stevenage Bioscience Catalyst as the research context. We then describe the data collection and analysis protocol before presenting our findings from this study.

Figure 1: Analytical Framework: Understanding the work the Strategic Nets do To Transform Markets

[INSERT FIGURE 1 HERE]

3. METHODOLOGY

Exploring the relationship between the respective practices of strategic nets and the process of marketization required a research design that captured the activities, experiences, beliefs and intentions of different actors through time, and charted their interactions as they carried out various forms of strategic conceptualisation work. Specifically, we paid attention to the routine, recursive conceptualisation practices performed by the strategic net. The strategic net is the strategic decision making unit that negotiates which practices will be performed by which actors and where. For example mentoring meetings between panel experts and mentors; summit meetings that presented key ideas on scientific discoveries, markets and the changing health futures landscape, and roundtable and networking events where hot topics such as technology convergence, big data and its implications for the centre were all discussed that all took place at SBC. We also looked at off-site practices such as the Discover Assist programme, where SBC representatives engaged in outreach activities, visiting universities and labs to support scientific discoveries and enrol interested scientists in SBC's networking activities. We looked at the patterned practices of SBC representatives attending boards and panels of other science incubators and accelerators.

To identify and access such practices we adopted an abductive, longitudinal, case study approach (Langley, 1999; Langley, Smallman, Tsoukas, & Van de Ven, 2013) following the practices of a strategic net (Möller & Rajala, 2007). As we began to understand more about the purpose of the strategic net, we turned to the marketization literature, which helped us focus our study on what we term *conceptualisation work* (cf. Araujo & Pels, 2015; Cochoy & Dubuisson-Quellier, 2013). We understand conceptualisation work as a particular form of marketing work that sets out to reimagine markets and their broader systems of provision with the intent to bring about change in them. As we understood more about the conceptualisation work being performed by our strategic net we turned back to the literature and adopted theoretical categories of market devices to see how

practices were connected with producing and circulating different forms of market devices in order to bring about market change (Çalışkan & Callon, 2010). We also returned to the network literature to see if phenomena being observed had been described their in any way (cf. Järvensivu & Möller, 2009). This enabled us to generate the analytical frame presented in Figure 1, and led us to ask more specific questions about the types of practices producing market devices and associated market interventions. Finally, we worked iteratively with the data and the literature to identify and label the patterned practices we observed (Gioia, Corley, & Hamilton, 2013).

Abductive, longitudinal research designs such as this are particularly useful to address what, how and why questions and the unfolding of practice over time (Alvesson & Skoeldberg, 2009; Easterby-Smith, Thorpe, & Jackson, 2008; Siggelkow, 2007). Our questions, '*What kinds of conceptualisation practices does the strategic net perform to generate new and disruptive market devices?'* and *'How do conceptualisation practices influence particular markets and the broader system of provision?* are consequently well disposed to this approach. Qualitative, single-case designs have a long tradition in research on networks (Aaboen, Laage-Hellman, Lind, Öberg, & Shih, 2016; Baraldi & Strömsten, 2009; Guercini & Runfola, 2010), B2B relationships (Finch, Horan & Reid, 2015; Mason & Leek, 2008) and strategic nets (Harrison et al., 2010; Partanen & Möller, 2012; Rusko, 2014), more specifically. They are valuable when it seems inappropriate to impose prior constructs or theories on the informants as a preferred means of explaining of understanding their world (Gioia et al., 2013). For example, while we are guided by emergent theories of marketization, there are as yet no empirical studies that explain the type of practices routinely performed in doing marketization work. Therefore, adopting an inductive approach initially, and then working abductively between the data and literature to see how our conceptualisations of the practices performed were recognised in the extant literature, seemed likely to generate new and valuable insights (Dubois & Gadde, 2002; Järvensivu & Törnroos, 2010).

Because we wanted to understand more about the deliberate and purposive work strategic nets engaged in through their performance of the marketization process, we needed to identify a strategic net that had the disruption and re-formation of markets as its purpose. Such initiatives are usually strongly associated with innovation and particularly in settings where scientific understandings and the development of new technologies are fast-developing, and new methods of valuing innovations are needed (Callon, 1998a; Möller & Rajala, 2007; Perkmann et al., 2013). Life Sciences fit well into this category (Perkmann et al., 2013). The speed of change and the uncertainty of technologies are well-recognised, and the need for new sustainable healthcare provision is widely reported in the press, in professional and government reports and is acknowledged as being of concern to policy makers (see for example, Life Sciences Industry and UK analysis, 2014). This presents the Life Science and biotech markets as suitable contexts to study the marketization processes and practices, particularly through the examination of the strategic co-ordinated action of a strategic net operating in this sector.

3.1. Research Context

In this section we briefly outline the Life Science context to provide a high level picture of the strategic net we investigate. This creates the empirical backdrop for the detailed empirical analysis of the marketization of Life Science innovation. This paper is based on the case of the Stevenage Bioscience Catalyst's (SBC) strategic net. SBC is a joint venture between GlaxoSmithKline (GSK -a

global pharmaceutical firm) and the Wellcome Trust[2] , with significant funding from the UK Government. SBC is situated on the GSK R&D site, and offers laboratory space and a flexible range of scientific and business services as part of their incubation offering to science entrepreneurs based there as tenants.

Since its inception in 2011, SBC has developed into a major hub for bioscience incubation in the UK. It forms a network of organizations that include major pharmaceutical firms, small biotechnology companies, research-intensive universities, consultants, venture capitalists and other funding organisations, as well as policy-makers. The very purpose of SBC is the marketization of biotechnology research, making it an optimal context within which to study the role of strategic nets in the process of marketization. To draw boundaries around our case study we adopt Möller et al.'s (2005: 1275) definition of a strategic net: *"intentionally formed networks that contain a finite set of parties, at least three"*. In our case we consider SBC, GlaxoSmithKline (GSK), and the SBC tenants (which are mostly small biotech start-ups) as a strategic net. We also recognise that SBC was constituted by the strategic relationships between the UK Government's Department for Business, Innovation and Skills (BIS), GSK, the Wellcome Trust (WT) and Innovate UK[3] and that these organisations shape the activities of SBC's strategic net with GSK and SBC tenants more specifically (see section 4.1).

3.2 Data Collection

The unit of analysis of our paper is not the network itself, but the practices of SBC's strategic net. We set out to identify practices developed with the purpose of market transformation. We categorised the practices we observed as conceptualisation practices (Araujo & Pels, 2015). We found little evidence that production and exchange practices were core activities of the strategic net (see Figure 1). To demonstrate market transformation we needed to identify, 1) the new market devices (i.e. rules and conventions, methods and instruments of valuation, scientific, technical and market knowledge), being constructed through the practices of the strategic net, and 2) how these new market devices were inserted into broader market practices to re-construct market architectures, thus transforming how the market was performed (Araujo, 2007). In order to identify conceptualisation practices, the transformative market devices they produce, and the new markets such devices perform, we collected semi-structured interview, documentary and video data over a period of eighteen months.

Semi-structured Interviews: Our interviewees spanned a range of key stakeholders, including the CEO, CFO, Business Manager, and Business Development Manager at SBC as well as the CEOs of nine biotechnology firms located at SBC as tenants. We asked interviewees to describe the routine work they engaged in to marketize (or *'bring to market'* SBC#4) the science associated with the SBC strategic net. Overall, we conducted thirty-seven interviews (Table 1). Interviews lasted between forty-eight minutes and two hours. Interviews were semi-structured (Denzin & Lincoln, 2008). We asked interviewees to give us examples of their involvement at SBC as well as their interaction with

[2] The *Wellcome Trust* is an independent global charitable foundation dedicated to improving health. Visit: http://www.wellcome.ac.uk/About-us/Index.htm

[3] Innovate UK is the operating name of the Technology Strategy Board, the UK's innovation agency. It is a UK non-departmental public body operating at arm's length from the Government reporting to the Department for Business, Energy and Industrial Strategy (BIES).

other actors within SBC. One practice frequently cited by SBC managers was their support in helping tenants to develop their 'business models'. We followed up on these comments with tenants as they described their efforts to marketize their science. We had numerous informal conversations with biotech market actors we met at SBC workshops and events which we participated in as note-takers, orchestrators and speakers. Participants included tenants from other national and internationally-based incubators and representatives from pharmaceuticals, biotechs, consultants, lawyers and venture capitalists.

Documentation: Our analysis draws on documents including business plans, slide-decks, financial statements, press releases and the stories reported in the press, grant applications, white papers produced by the SBC team and government strategy documentation (cf. Morgan, 1983). Such documents provided additional insights into the processes of marketization. They enabled us to evaluate the outcome of interactions described in interviews (e.g. the collaboration of biotechnology firms for funding bids).

Video Footage of Events, Panels and Workshops: We were provided with video footage of events, workshops and panels organised by SBC. While we did not code the video footage, it provided us with background information on debates, problems and unfolding opportunities that were emerging from the network over a two-year period. This background information was crucial to understand the process of marketization (cf. Langley, 1999).

Table 1: Summary of data collection and timing

Timing	Interviews*	Documents & Videos	Events attended
Month 1	5x Interviews with tenants	Tenants' Documents that represent tenants' business models PR, white papers	Open Innovation Summit: hosted by SBC 200 key industry players & start-ups in attendance
	3x Interviews with SBC Execs.	SBC documents that represent SBCs understanding of SBC's business model; strategy documents and slide decks of presentation to board	
	2x Follow-up video interviews with tenants	Documents that represent SBCs understanding of SBC's business model; press release; video footage of open innovation summit	
Month 4	5x Interviews with tenants	Press releases, newsletters, press cuttings, official notes produced from workshop	Workshop hosted at SBC on 'The Convergence Agenda'
	3x Interviews with SBC Execs.		
	4x Interviews with workshop attendees		
	2x Follow-up video interviews with workshop attendees		
Month 7	5x Interviews with tenants		
	3x Interviews with SBC Execs.	New SBC strategy documents, and pitch for 2nd phase of campus expansion	
	2x Follow-up video interviews		
Month 17	3 x Interviews with SBC Execs	Activities audit report commissioned by SBC, independent consultant	Open Innovation Summit: hosted by SBC 140 key industry players & start-ups in attendance.

Note: Interview* quotes used in this paper are represented as *T#1, SBC #1*, or *GSK #1* for example, to provide some indication of the role of the interviewee in the strategic net but to also provide a degree of anonymity.

3.3 Data Analysis

Data analysis followed five steps (Gioia et al., 2013). First, we deeply immersed ourselves in the data. The video material as well as the interviews with the CEO of SBC provided us with sufficient background information on the purpose of the strategic net and its various participants. We compiled a descriptive list of activities that linked the various participants. Such activities frequently referred to the evaluation of markets and/or identifying/developing business models (used by our respondents as a valuation instrument). Detailed descriptions of these activities allowed the team of authors to interrogate the data, and formed the foundation for the subsequent analytical steps.

Second, we compared activity descriptions based on their commonalities and differences. By doing this we realized that marketization involved different types of work that we labelled 'conceptualisation work'. By discussing themes, we eventually identified three types of conceptualisation work: conceptualising actors' roles, markets and goods.

Third, following the abductive approach (Dubois & Gadde, 2002; Järvensivu & Törnroos, 2010), we moved from our data back to the literature and used Çalışkan and Callon's (2010) categories of market-constituting devices (rules & conventions, methods and instruments of valuation, scientific and technical knowledge and market knowledge) to further evaluate the transformative nature of the activities mapped out in stage one, for each type of conceptualization work.

Fourth, we honed in on each type of conceptualisation work (Figure 2) and compared and contrasted the descriptive themes for every market constituting device (Tables 2, 3 and 4). Through several iterations of data analysis we identified themes that capture the practices that underpin each type of conceptualisation work: conceptualising actors' roles (identifying, enrolling, mobilizing), conceptualising markets (mapping, representing, calculating), conceptualising goods (bundling, positioning, valuing).

Finally, we looked across the different forms of conceptualisation work to see if there was evidence across multiple but related goods, markets and actor-networks to generate higher order conceptualisations. This enabled us to see if there were efforts to conceptualise and influence the broader system of provision. We found some evidence of this. However, the inherent limitations of the research techniques are recognised (Jack, 2005). The study area was restricted, the small number of scientitists-entrepreneurs tenants and few broader market actors as participants outside of the strategic net, which inhibits generalisation (Larson, 1992). It was also quite a tight time frame within which to track the transformation of markets. However, the value of the research lies in its capacity to provide insights, rich detial and thick descriptions (Geertz, 1973) to produce a grounded model which can generate hypotheses for further testing (Larson, 1992). Further the approach used to select respondents provided valuable, rigorous data about the powerful associations we wanted to study.

4. FINDINGS AND ANALYSIS

The extant market studies literature presents markets as organising systems for the 'conception, production and exchange of goods' (Araujo & Pels, 2015: 451), positioning them as outcomes of markets. We concur with this view but additionally show how the conceptualisation work of a strategic net generates new conceptualisations of markets and goods that contest extant market

conventions, valuation methods and the scientific and market knowledge that circulates. Our analysis identified three forms of conceptualisation work constituted through distinctive practices: conceptualising actors' roles; conceptualising markets and conceptualising goods (Figure 2). We found that as conceptualisation work begins to transform both the constitution of the strategic net and the performance of the market, new connections between actors, markets and goods generate new conceptualisations of the broader system of provision – which in our case were discussed as 'healthcare futures'. We present these findings below.

Figure 2. Data Structure for the Categorisation of Conceptualisation Work

[INSERT FIGURE 2. HERE]

4.1 Conceptualising Actors' Roles

Our analysis foregrounds the conceptualisation work done to develop a strategic net and shape collective market action. We identified three key practices related to conceptualising actors' roles: identifying, enrolling and mobilising. *Identifying* actors involved working out which actors' portfolios of activities were likely to impact on health market futures, and understanding what these actors might bring to the network in terms of knowledge, resources and expertise. *Enrolling* included collectively imagining how actors would become enrolled in any planned action and what specifically their role might be. *Mobilising* work involved imagining and co-ordinating activities that committed actors to the fulfilment of those roles (see Table 2).

We found similarities in the language of the ANT literature and the networks literature in relation to the notions of *enrolling* and *mobilising* in particular. In ANT inspired studies *enrolling* and *mobilising* are generally understood to be part of a sociological process of 'translation' that engages others in the enactment, resituating and co- or re-production of new forms of knowledge and knowing. The interest of these scholars is to understand how knowledge is generated through collective networks of action (cf. Callon, 1986; Finch & Acha, 2008; Geiger & Finch, 2009). In the networks literature *enrolling* and *mobilising* are more strongly associated managerial work that lacks the hierarchical frame of an organisation and so must be achieved through collaboration in networks of autonomous actors (Agranoff & McGuire, 2001; Järvensivu & Möller, 2009). In both cases there is recognition that this form of managing is qualitatively different from hierarchical management functions traditionally associated with organisations. The emphasis here is on the collaborative, coordinated action. This persuades us to see enrolling and mobilising as central to the conceptualising work associated with network development and maintenance.

4.1.1 Identifying and Enrolling Practices

Identifying and Enrolling practices were often (though not always) performed simultaneously. Early conceptualisation work performed by the strategic net was concerned with identifying and enrolling actors in the strategic net, in a programme of action: *"act[ing] as a catalyst for the commercialisation of science" (SBC#1)*. This included working out the roles of GSK, BIS, WT and Innovate UK in creating a Catalyst for the commercialisation of science, and the role of the catalyst itself in transforming health markets. The 2009 UK Government's Commercialization of Life Science initiative was behind this effort. The aim was to generate progressive healthcare markets (Bloor,

RSriskandarajah, Croxford, & White, 2011), and *"…shake up health markets by generating more affordable healthcare solutions…as well as generate economic growth"* (BIS#3).

SBC was constituted by the strategic net (Figure 3) with the intent of enacting 'the commercialisation of science'. Each organisation negotiated its role as funders, as providers of resources and expertise, and as active members of SBC's 'World Class Advisory Board' (SBC website) in an enrolling process. GSK were to provide land for a 'campus' development on their site in the South East of England, and access to technical services through Scinovo (their discovery and development consulting arm). Both GSK and WT were to provide individual scientists with business start-up support.

As the strategic net worked through this process of enrolling, SBC did significant conceptualisation work to generate an identity that explained what SBC would stand for, the types of activities it would get involved in and the form it would take. By mapping out the problems faced by those attempting to commercialise science (and failing or struggling to do so), the current limitations of extant incubation provision of other science parks in the UK, the activities of overseas science parks and catalysts, as well as the expertise and resources that might be available within the strategic net, the actors in the strategic net began to collectively build an understanding of the structures, activities and outcomes that SBC should adopt and develop. This was a recursive process and routine analysis and reviews were undertaken, reporting at quarterly board meetings.

Figure 3. The Key Actors in SBC: Described by SBC as their 'Model'

[INSERT FIGURE 3 HERE]

These concepts were used as valuation instruments to help SBC tenants, and key market actors that SBC wanted to enrol (including pharmaceutical companies Johnson & Johnson, Eli Lilly and GE), to see the SBC activities 'not as business as usual' (SBC#1). SBC used these concepts as tools to mobilise the network. By circulating these tools they were equipping the market to calculate and value the development and commercialisation of science in a different way. Through these activities SBC enacted their role as a 'catalyst', developing a,

> *"…culture of open innovation [to] accelerate the discovery of cutting-edge healthcare solutions and place the UK bioscience sector at the forefront of worldwide biomedical innovation" (SBC website, May 2015).*

4.1.2 Mobilising Practices

One of the outcomes of this early conceptualisation work was the 'Open Innovation Campus':

> *"…designed to foster cooperation, scientific and commercial dialogue and interaction between entrepreneurs in the Incubator and scientists on the GSK R&D site, while respecting their freedom to interact with any commercial or academic partners. ….. and to provide access to equipment and facilities that would otherwise be beyond the reach of small and medium-sized companies"* (SBC#1).

As the open innovation campus materialises, new market practices are imagined and designed in to the workplace (e.g. regular open innovation conferences, seminars and round tables were established, a programme named 'Discover Assist' was developed to continually identify and enrol potential tenants, or actors that could form an important part of existing tenants' networks). The

campus provides 4,750 square metres of office and laboratory space and valuable opportunities for scientific and commercial networking. Tenants retain full independence and the freedom to interact with commercial partners and are encouraged to interact and support each other's activities.

> *"We want businesses at the SBC to learn from each other, as well as draw on the resources that GSK have to offer."* (SBC#2)

The role of tenants also became important in the conceptualisation work, with '*anchor tenants'* identified as being '*of strategic importance*' (SBC#6). Much work was done by SBC to secure the tenancy of key market actors thought likely to impact the unfolding science and markets in '*the healthcare space'* (SBC#3). For the SBC team, the selection of tenants was crucial - having science ready for progression was a necessary but insufficient qualification for tenancy:

> *"They [tenants] have to be right for us. They have to fit. They have to get 'it' [pause]... the open innovation thing – and some of course are of strategic significance"* (SBC#2).

In this sense, conceptualising actors' roles extended beyond the work of understanding who was to act as part of the strategic net and how, and beyond imagining the actor-networks required to develop and launch particular scientific discoveries in particular markets. Ultimately, and simultaneous to this work, this form of conceptualisation work spilled over into imagining the broader system of provision and became focused on *'how it could work as a self-sustaining ecosystem'* (SBC#2).

In sum, we found practices conceptualising actors' roles to be a significant part of the marketization process. We saw recursive practices identifying potential market actors, enrolling and mobilising those actors and their broader communities as a central part of the work performed by the strategic net. We found that the strategic net invoked academic tools and instruments to generate new ways of conceptualising market action (e.g. open innovation, ecosystems) and through their circulation, contestation and development, made them valuable (Çalışkan & Callon, 2010). Valuation methods used in the 'conceptualising actors roles' practices of the strategic net - identifying, enrolling and mobilising market actors - acted as market devices (Callon, Millo & Muniesa, 2007).

Our analysis generated further insights into the plastic nature of the strategic net. While the core strategic net remained stable, we saw SBC develop and relinquish various powerful associations with actors as conceptualisations of what the market was becoming unfolded. This provides a more nuanced understanding of how a strategic net is reproduced through its practices.

Table 2: Conceptualising Actor's Roles to Transform Markets

Conceptualising Actors' Roles	**Devices that Constitute Markets**			
	Rules & conventions	Methods and instruments of valuation	Scientific and technical knowledge	Market knowledge
Identifying	Who/which key market actors are making/breaking the rules and conventions of the market	Who/what is generating new instruments to value such advances (in terms of social benefit and economic benefit	Who is generating scientific advances and what are the big themes	Who has market knowledge and how and where do they represent those understandings of the market.
	"Now we [tenant] know how to go out and fundraise, now we know what it's all about, we use the science and the professionalism that GSK gives you, but now we can go out there and do what we would view as a proper job, building biotech." (T1)	*"We're not using the Twitters and whatever the digital methodology… that will change and there's a business opportunity there for doing it for drug discovery. … you can then see how rather than the government deciding we're going to invest in antibiotics, individuals can perhaps have more of an input into how the money's spent." (T2)*	*"… the Discover Assist programme is all about finding where the interesting science is happening and bringing it into SBC – or sometimes even supporting its development more remotely*" (COO SBC)	*"…identifying the right kind of tenants that 'get it'… that understand what we are trying to achieve here with an open innovation approach is key…. They have to be prepared play an active part in this creative, supportive culture…"* (SBC2)
Enrolling	Imagining how rules and conventions of the market could be changed with specified 'others' and working to agree who will take on the different roles to make this happen	Gaining commitment and 'buy-in' from specific others to take on the role of developing new valuation instruments for new technologies and practices	Engaging others to produce and circulate new forms of scientific and technical knowledge as part of a 'community'	Engaging others to share and generate with you ways of describing how the market is changing
	"We bring together all the regulatory agencies so that we can solve these problems together" (T42)	*"By getting buy-in to the open innovation culture we can help tenants build partnership and explore relationships that accelerate the science and how they bring it to market"* (SCB3)	*"we [the tenants] have quite a bit of experience now of getting [discovery] funding from different grant bodies and we share this – so there is quite a bit of community and activity around that"* T1)	*"showing folks [start-ups] how they can be involved and connecting them with others in the market is an important part of what we do…." (SBC2)*
Mobilising	Organising and co-ordinating those that will work to change rules and conventions of how the market normally works.	Assembling and circulating new and developing valuation instruments (e.g. description of disease interventions and their value; descriptions of new market practices and their value; tools and concepts such as the business model, open innovation and ecosystem)	Assembling and circulating new forms of scientific and technical knowledge within the community	Assembling and circulating new understandings of the market and its transformation within and beyond the community
	"Our stakeholders are so complimentary about how we built an open innovation campus focussing on biotech … And now you say, will are gonna expand the business model. And all of a sudden you are adding on something and you have to convince them that this is a natural extension and that there are some serious" (MD SBC)	*whatever I see in that area, I will then look at it and say, "Does that look like a tangible piece of evidence or a valuable piece of research? Is it worth me sending it on," because there's a reputational risk if I'm sending something on…(Consultant SBC)*	*"So at the moment, for bioelectronics, if you look in the universities, nobody has a label of being a bioelectronics specialist. So they're under the radar and what we're going to try and help is identify, through things like Discover Assist, how do we get to those? because it's people who are doing something a bit whacky…" (COO SBC)*	*"so then we went out and essentially went out to the Academic Health Science Centres and said "look, apply please". So, we went to the leading academic groups and tried to explain why this would be an interesting thing to do and it wasn't just about the money, we were, as SBC going to try to provide support and, you know, a bit of industry." (EIR SBC)*

4.2 Conceptualising Markets

We identified three key practices that performed *conceptualising markets*: mapping, representing and calculating. *Mapping* involved explaining the relations between multiple market actors and their activities. Relationships between the wider groups of market actors were not always apparent. Understandings of relationships and the potential for co-ordinated, collaborative market action were routinely shared between actors within the strategic net. *Representing* involved generating epistemic objects that illustrated what a market was, in a meaningful way, for a given audience. *Calculating* involved making judgements that promoted certain forms of representation and action (see Table 3).

We observed commonalities between our conceptualisation of mapping and representing markets with the way network pictures are described in the networks literature (which has viewed markets as networks), as a sense making process (cf. Henneberg, Mouzas & Naude, 2006; Leek & Mason, 2010; Mason & Leek, 2012). However, we take this concept further by looking at these as recursive practices that produce mappings and representations which have the power to transform how markets are performed. In adopting this performative view, we consider the outputs of such practices as generative and calculative (Callon & Muniesa, 2005; Mason, Kjellberg, & Hagberg, 2014; Pollock & D'Adderio, 2012) in ways that help managers work out what markets might be and how they might work in future.

4.2.1 Mapping Practices

One of SBC's key activities was conducting monthly mentoring meetings with tenants. Mentors questioned tenants to understand what they were trying to do: mapping out relations between key market actors, knowledge or resource gaps and developing avenues for further exploration. This mapping process developed the scientific, technical and market knowledge of both the mentor and the mentee, and resulted in the identification of new connections that might need to be made within and beyond the strategic net as well as generating new representations and calculations. One tenant told us:

> *"[My mentor] was asking me to explain what I thought the market was for the biomarker I'm working on …. he said if you try and sell that to doctors it will be like rolling a stone uphill. Why don't you look at the value of it for pharma? – that changed everything…."* (T#3)

Mentoring sessions often resulted in tenants being equipped with new market or scientific knowledge and calculative, market devices. These often mobilised tenants into making new connections, associations or developing new programmes of action:

> *"We'd had several meetings [with different tenants] that had basically made the point that explaining the commercial potential of whatever science they [tenant] were doing [in grant application forms] was really difficult. So we ran this workshop about developing a business model… using the business model canvas to help them [tenants] work out their business, and where the value would come…."* (SBC#4)

The business model canvas[4] presents key questions for a business, including a section on 'customer segments' and asks: 'for whom are we creating value?' and 'who are our most important customers?' and lists ways in which markets are typically represented 'mass market, niche market, segmented, diversified, multi-sided platform'. It urges users to consider key partners, activities and relationships and revenue streams.

These mapping exercises foreground the need for new forms of partnerships. Such mapping exercises have shaped the support activities that the strategic net engages in. One of the key themes at the 2016 Open Innovation Summit, following business model mapping activities with tenants, was *The Growing Need for Partnering*. At this conference the skills needed to identify and develop good partnering relationships, access new knowledge sets and develop and speed up new forms of clinical trials for these emergent technologies were explored and *'best practice'* (SBC Conference Ad.) stories from experienced practitioners were shared.

Key market actors were invited to these events, both as participants and as speakers; pharma companies, venture capitalists, academics, government agencies and so forth. Networking over coffee was encouraged and seen as an important part of these programmes. A number of market representations were generated and circulated as a result of these events, including White Papers, slide-decks describing size of markets, market growth, new or interesting market actors, descriptions of their activities, and the changing practices in the sector. Many of these market representations described different health markets, how they overlapped, had potential for expansion and speculated about the process and practices that might make imagined futures become real.

4.2.2 Representing and Calculating Practices

Representing and calculating practices were sometimes entangled. The business model canvas acted as a calculative, market device that helped tenants work out how to represent the potential value of their science not only for a specific customer, and for consumers but additionally for the wider system of provision for health:

> *"… many of these [new] therapies are personalised because they are the patient's own cells. This will change the supply chain - cells go from the patient, to the cell manufacture, back to the hospital, and in a time sensitive way. Big pharma don't want to do that –if they don't they probably won't be there in 10 years' time."* (T#42)

Business models were often re-presented in carefully orchestrated forums, so that they could be questioned and their format negotiated; expert panel presentations, in mentoring meetings, in tenant support group meetings, at conferences and workshops. One tenant explained,

> *"We need to develop orthologous business models… firms that have tried to develop solutions and charge high prices are coming up against healthcare economics that inevitably squeeze margins. We have put together a reimbursement and financial modelling group to work out these new economics"* T#42"

T#42 presents an argument for centring the business model design on the realities of 'healthcare economics', replacing traditional valuing methodologies in these markets. While in the development

[4] http://www.businessmodelgeneration.com/canvas/bmc

of disease treatments we consider the logic of social value (i.e. what is socially valuable has economic value), few consumers could afford this at full economic cost. The argument here is for new forms of calculation based on healthcare economics.

The business model (and what it calculates) represents a radical change to commercialisation of science. Not only are scientists calculating the potential social value of their science (i.e. a cure for breast cancer) but additionally they are being equipped to problematize, imagine and explicate the system of economic value within which their very particular scientific endeavour sits. The business model, the forums within which business models are represented and discussed to explore 'health futures' generate new representations of imagined re-configured systems of provision for better health outcomes that connect the various markets (for cell therapies, for robotics, for digital health) together. What is interesting here, is the institutional support structures that are being put in place by the strategic net to generate this kind of conceptualisation work. Tenants were being equipped (using the concepts of business models; open innovation and ecosystems) to conceptualise and connect markets in new ways. These calculations are leading to new conceptualisations of co-ordinated market action.

The strategic net generated conceptualisations of markets (often in conversation with tenants), that were circulated in wider networks. For example, SBC hosted 'Convergence Agenda' workshops and annual 'Open Innovation Summits' where 'health futures' were collectively imagined and the nature and pace of change in market practices were discussed, contested and reframed. The 'Convergence Agenda' workshops focused on uncovering how different technologies were coming together (or could potentially be brought together) to generate new health solutions – for example the collision of 'big data' and its increasingly sophisticated data analytics, with new diagnostics and developing science in cell and gene therapies and bioelectronics.

In sum, we found that conceptualising markets, both for tenants' individual scientific discoveries, and for the broader system of provision, formed a significant part of the strategic net's work. This evidences claims that indirect and unintentional contributions of actors working to commercialise their own science plays a critical role in broader marketization process (cf. Aarikka-Stenroos et al., 2014). Further, it foregrounds the role of the strategic net in co-ordinating activities and generating practices that enables this to happen. We identified recursive practices designed to map out and represent the actors that both constitute and connect unfolding markets (e.g. pharmaceutical markets, medical devices markets, digital health markets). Such actions made markets calculable in new ways. The association between market actors and new scientific and market knowledge was generative of such market devices. Mapping and calculating often took place in carefully designed forums where such devices could be readily contested and negotiated. These forums (mentoring meetings, conferences, outreach activities etc.) were designed specifically for such purposes.

Table 3: Conceptualising Markets

Conceptualising Markets	Devices that Constitute Markets			
	Rules & conventions	Methods and instruments of valuation	Scientific and technical knowledge	Market knowledge
Mapping	Mapping out relationships between key market actors that generate/sustain market rules and conventions	Mapping out groups that are working on similar/related valuation instruments and methods and their (groups of) actors that might use such instruments.	Plotting the relationships between groups that are working on similar/related projects and that generate new scientific/technical knowledge (i.e. dementia, oncology) potential markets (users/consumers)	Charting and gathering together new understandings of the market and their dynamics from the broader market system
	"If you left things in the formative stages to the market, you may or may not see things happen. We have had to do far more environment shaping and stakeholder work that I ever would have imagined" (T#42)	*"There is a lot of uncertainty in biotech – that's what puts VCs off. So we are working with them to try and understand the sort of data they need to help them make good investment decisions" (SBC#11)*	*"if we thought of our biomarker as a way of helping big pharma argue for the effectiveness of their drug, instead of a way of helping doctors work out who should have what drugs, then the market becomes much more accessible – and how you engage with that market is completely different." (T#3)*	*"I'm work with other bioscience incubator and accelerator institutions and I'm Chair of the UK Bioincubator Forum, representing 24 bioincubators across the UK – so we talk about what's happening and I'm mapping constantly who the key & emerging players are so I know what's going on where." (SBC#2)*
Representing	Presenting and problematizing understandings of market rules and conventions	Visualising and presenting new forms of valuation for science, markets and market practices	Re-presenting and circulating new understandings of science that are accessible/meaningful to other non-scientific market actors (user groups, VCs etc).	Characterising different versions of the market through different assemblages of market knowledge
	"… so if you're going to them [big pharma] you need gold plated data, or they'll want you to repeat trials and you lose value" (T#7)	*"James presented a few slides on a possible definition of convergence, which included three 'bubbles'" (COO SBC)*	*"if you're talking to big pharma – they'll know what you're doing… but VCs are different…. they often don't have a scientific background – so being able to nail down and explain what you do is crucial" (T#7)*	*"we present to the board – and it's not an easy ride – they share their thoughts on what we think is happening to the market"* SBC#1 [shows us slide decks including market representations by product category
Calculating	*Assessing which rules and conventions need to be changed and how*	*Assessing if new forms of valuation are needed and how these might work.*	Re-presenting and circulating new understandings of science and its potential to work out (calculate), (potential) value (social/economic)	Gauging and evaluating what the market is becoming, how it is transforming and what it might be like in future.
	"We set up a regulatory and clinical trials working group to develop a cohesive approach to work with regulatory agencies that are reaching out and asking for help… approval times have been reduced from 18 months to 30 days" T#42	*"We need to develop orthologous business models… firms that have tried to develop solutions and charge high prices are coming up against healthcare economics that inevitably squeeze margins. We have put together a reimbursement and financial modelling group to work out these new economics" T#42*	*"There would be a little bit of a road show. They'd engage with academics. They would present some of their germinal ideas in a non-confidential way and then if they looked to be of mutual benefit, which I consider this open innovation part, you know, "is there a mutual benefit going forward?" then they would be invited to engage in a bit more details." (T#2)*	*"convergence … requires new business models. And having access to academic expertise that can help, and advise and point us in directions that opens up maybe new business models that we maybe haven't thought about yet would be awesome." (CEO SBC)*

4.3 Conceptualising Goods

SBC worked with tenants to help them conceptualise specific, tradeable goods. Goods are understood to be the bundle of products and/or services that have been made tradable. Goods are stable, delimited and definable, with objective properties that allow the application and transfer of property rights (Callon & Muniesa, 2005). We identified three key practices associated with conceptualising goods: bundling, positioning and valuing. *Bundling* involved tenants working out whether their science could be sold in a discrete transaction, (as a medical intervention for disease X), or as a bundle of 'science and service' (T#4), i.e. selling biomarker analytics services to hospitals or pharmaceutical companies. Closely associated with this form of conceptualisation work was the *positioning* of imagined goods within specific markets and working out the potential value of the trade. Extant research shows that there are very different business models for the commercialisation of science; these effect the positioning of goods within specific markets. Our findings show the work the strategic net does to position new and innovative goods within markets or against existing offerings, framing new markets. *Valuing* practices calculate the worth of goods.

4.3.1 Bundling, Positioning and Valuing Practices

Our analysis revealed the entangled nature of bundling, positioning and valuing practices as tenants and mentors worked to conceptualise goods. Because scientific discoveries 'live or die' (T#5) on the basis of the data that accompanies them, the strategic net developed practices to support tenants in bundling their science with different forms of data to make it into a tradeable good: as 'phase 1' or 'phase 2' concepts (T#5). This often took place through a series of mentoring meetings and presentations to 'expert panels'. Experts advised tenants on the types of data that would make the science credible. We saw mentors make particular introductions and connections between tenants and other strategic net actors to progress this form of conceptualisation work. Tenant #6, who established a research and development start-up in 2011, is a good example: Tenant #6's science focuses on taking molecules from proteins produced by bacteria that have anti-inflammatory properties and using them to manipulate the immune system. The company anticipated taking their first molecule to Phase One clinical trials within the year. Investors and grants had provided research monies to date. Tenant #6 identified the need for "gold-plated data" in order to make their molecules valuable – which they needed to "buy-in" (T#6). In this sense, the tradeable good that was in need of conceptualising was not the target of the scientific discovery but rather the 'clinical services' of a credible pharmaceutical company.

"Gold-plated" or "valuable" data are framed by Tenant #6 as the tradable good for a specific type of customer and needed to be purchased in the form of a service from a specific type of potential supplier (that might end up being the customer for the molecules under development) -"Big Pharma" (T#6). The data become valuable when they comply with conventional specifications and parameters, and when they are present in an accessible and familiar format to potential investors or buyers. These are the 'rules and conventions' of the market. Tenant #6 explains:

> *"… it's really important for us to get data associated with our molecules, that is world-class and super high quality…… so my imagination was, if I'm going to sell this to GSK, they need to be happy with the data. …. So I walked across there [points to the GSK building out the window]… and it was in the spirit of open innovation, they said they could run it in their animal house, they hadn't run it for anyone outside before. And they*

had to run it in a certain way that hadn't been done before. It took eighteen months of negotiation…. making sure the scientists were happy to do it, that there was a contractual framework – that was quite straight forward…. the really difficult thing and the thing that took eighteen months was getting a payment infrastructure in place."

GSK had no way of valuing the clinical trials or of managing the income from the clinical trials and so could not begin the work until new structures and practices had been put in place. GSK actors had to be equipped to value, so that Tenant #6 could buy their services. Without such services the scientific discovery could not be valued. This is what Çalışkan and Callon's (2010: 5) refer to as *'pacifying goods'*. In our case we saw that biomedical practices raise difficult problems in terms of economic framing (i.e. it was difficult to value scientific discoveries without clinical trial data), so new practices had to be developed to deliver this. In this case, some market rules (the data standards) are held, while others (buying such data from a 'big pharma' company) are transformed. Through this process the market architecture is transformed.

Throughout the marketization process, the goods that need to be conceptualised and made tradable are multiple and contrasting in nature within a single system of provision. As one member of the strategic net put it:

"…most processes coming out of academia were craft-based …they did terrific work but those processes are not scalable…. We put a team of people together so processes could be made recognisable to a regulatory body and could be controlled, and made reproducible. We set up trial groups...put together a project … so that we could encounter problems and then lower barriers. Once you've lowered the barrier everybody else in the sector can play. Now people are more confident about what needs to be done. We've brokered a one-stop-shop for regulators in this space." (CGTC#42)

This observation marks a step change from thinking about specific markets for goods to thinking about the relationships between markets. The same respondent told us that changes in gene therapies would lead to a complete 'redesign of the supply chain'.

"treatment involves taking cells out of people's bodies, editing them and then putting the same cells back into the same person's body in a timely and condition-appropriate manner, then hospitals may not be the right places to treat people anymore…. and pharma can't do this…." (CGTC#42)

The effort to think about health futures was continually challenged and revisited as new discoveries in the network emerged.

For other scientific discoveries bundling and positioning practices required the strategic net to gather together market and scientific knowledge to create a powerful argument for why and how a particular scientific discovery would engage with the system. A GSK participant explained,

"…we need to know the platform players. Platform technologies are outside the people who pull through the therapies" (GSK#3)

This type of conceptualisation work both positions the discovery within a broader system and looks to bundle it with other goods/services to create a 'solution' for the market.

Table 4: Conceptualising Goods

Conceptualising Goods	**Devices that Constitute Markets**			
	Rules & conventions	Methods and instruments of valuation	Scientific and technical knowledge	Market knowledge
Bundling	Gathering of information to represent new assemblages of 'goods' (and scientific discoveries) in accordance with market conventions by demonstrating 'market need'	Getting together multiple instruments to value new forms of goods (i.e. bringing scientific and market instruments together to present 'solutions' to 'problems')	Assembling different forms of scientific and technical knowledge to present a solution to a problem with scientific-socio-political dimensions attached (i.e. treatment for dementia)	Assembling 'market data' to represent a version of healthcare provision and consumption that demonstrates demands for new science-service bundles of goods.
	*"It was highlighted that we need to understand medical/clinical sciences to mean *any* science being applied to a medical objective, so that we capture the bioelectronics side properly - including disciplines like engineering, materials science, nano, electronics etc. as they get converged with neuroscience, physiology etc. in new ways." (SBC Workshop Minutes)*	*"Then one of our experts on the expert panel worked in neuroscience in Merck and I knew him and so he and I sat down together and, basically, sifted through this huge list and boiled it down to two themes. And we said "right, we're going to pick these two themes and we're going to put the call out for these two themes". (EIR SBC)*	"…we need to know the *platform players. Platform technologies are outside the people who pull through the therapies" (GSK#3)*	*"Looking at the system and negotiating new ways of accessing services can transform what is brought from whom and how." (T#6)*
Positioning	Understanding and articulating and evidencing how new goods comply with market conventions – to demonstrate quality/legitimacy	Developing practices to demonstrate value by developing comparators and valuation instruments	Marshalling different forms of scientific and technical knowledge to position a good within a market	Evidencing how new conceptualisations of goods fit into existing markets or act as major market transformers (game changers) yet become legitimate/accepted goods in a market
	"… if I'm going to sell this to GSK, they need to be happy with the data" (T#6)	*"they [tenants] need to know how to explain themselves, present their pitch and explain the potential value of their science in relation to what else is out there. We share presentation, slides, successful grant applications to help them do this."* (MD SBC)	*"the value of the network is more about the visibility that we have by being here; … sometimes they have companies like big pharma or large … biotech companies come here to take a look at the different companies and see if there is any possibility of collaboration, and through the network we have access (T#8)*	*"X [mentor] told me if I repositioned how I talk about the biomarker, then my market is big pharma and no the NHS or other clinicians and that's much easier to sell into"* (T#2)
Valuing	Conventions on data presentation that are followed by scientists when presenting their ideas to potential investors and grant bodies.	*Goods are evaluated as potential revenue generators and existing/new methods of valuation (and valuation instruments) are used to present a persuasive case for change.*	*Scientific evidence is presented to create a persuasive case of social value (i.e. effective treatment, diagnostics that reduce healthcare spend etc.)*	*Evidence is marshalled and re-present to value new goods in terms of market activity and share.*
	"It's a matter of making sure that we are having project plans which is credible to the industry …So once we have a data package …we're going to need to present this package of data about a drug candidate, if you like, investors or pharmaceutical people and it needs to be secure" (T#5)	*"… SBC did a workshop using the Business Model Canvass. […] There is always a section on grant forms where you have to explain the value of your science – how you're going to make money from it – and this is the first time you really have to think through and be clear about it [….] Several of us have used the Business Model Canvas to help us do this." (T#2)*	*"we need to get data for proof of concept" (T#11)*	*"X was really helpful in helping understand how to describe the market… and look up figures that gave a sense of the market size and the significance of that market – obviously the bigger the market the more likely investors are to be interested in what you're doing" (T#7)*

We found that conceptualising goods for tenants' individual discoveries often raised questions about how the system of provision would support each discovery's development and marketization. The strategic net not only worked to conceptualise goods but through these practices found generated new conceptualisations of how the broader system of provision for healthcare would be transformed.

4.4 Conceptualisation Practices and the Broader System of Provision

While we were able to identify distinct forms of conceptualisation practice, we also observed, 1) that the scope and scale of market conceptualisations varied and 2) that connections were frequently being made between markets generating broader conceptualisations of healthcare provision. When questioned about this observation, one respondent told us that this was a 'comfortable shift' (SBC#4) that helped the strategic net work out their own strategy (i.e. where to focus their marketization efforts), as well as seeing it as generating valuable market devices for others engaging in the market who '*continuously had their feelers out, mapping out the landscape and charting the new terrains'* (SBC#4). We observed that the conceptualising practices generated new descriptions of markets for 'bioelectronics', 'gene and cell editing' and 'big data' which then had to be taken into account, precipitating further market conceptualisation work and broader discussions at Summit events on 'health futures'.

New conceptualisations of markets resulted in specific searches and connections for others to become part of the network, allowed some technologies to be suspended in states of stabilised uncertainty (precipitating 'protected' R&D funding and limited market activity – as in the case of bioelectronics) and others to be moved forward. For example, by the end of our 18-month study, the Gene and Cell Therapy Catapult[5] were awarded significant space on the SBC site, and was becoming an increasingly influential actor within the strategic net.

It is worth noting that conceptualising actor's roles, markets and goods did not occur independently or sequentially as others might suggest (see for example, Carrillat, 2004; Jaworski et al., 2000). Rather, the entanglement of conceptualisation practices allowed actors in the strategic net to zoom in to the development of a various molecules and their potential market, before zooming out, to explore how a healthcare system might accommodate consumers with co-morbidities and complex medical and social care needs, as scientific discoveries advanced.

5.0 DISCUSSION

Our findings contribute to the strategic net literature by explicating strategic nets as actor-networks. This builds on a strong tradition of research on strategic networks of innovation (cf. Aarikka-Stenroos et al., 2014), by providing an in-depth empirical analysis of the powerful associations, deliberately and purposely generated by the co-ordinated and recursive practices of a strategic net. It foregrounds how actors in the network assemble and generate scientific, epistemic and technical objects in order to progress the marketization of scientific discoveries. The practices developed and performed by the strategic net, through their engagement in a process of marketization, generate

[5] The Cell and Gene Therapy Catapult is a centre of excellence in innovation, with the core purpose of building a world-leading cell and gene therapy sector in the UK as a key part of a global industry. Supported by Innovate UK, their mission is to drive the growth of the industry by helping cell and gene therapy organisations across the world translate early stage research into commercially viable and investable therapies.

new and multiple market devices that become part of market architectures, so transforming how markets are performed (Çalışkan & Callon, 2010). This has two important theoretical implications.

First, it suggests that conceptualisation practices generate conceptualisations of actors, markets and goods (and associations between them) that transform how markets are performed. Conceptualisations are re-presented and circulated, and act a market devices. New market devices can re-configure how market actors act with regard to conventions and rules of the market (even when those rules are 'new'), the methods and instruments of valuation and scientific, technical and market knowledge (Çalışkan & Callon, 2010; Muniesa et al., 2007). We observed how the strategic net generates and circulates new market devices that are then picked up and used by multiple market actors to make judgements about how they should act in that market (cf. Callon, 2007; MacKenzie, 2006). This moves us some way towards understanding *how* conceptualisation practices influence particular markets and the broader system of provision, by showing that the market devices they produce re-configure markets, changing how they are performed through new conventions of calculating and valuing, and re-presentation of new forms of scientific and market knowledge. For example, we saw how, by circulating and problematizing extant understandings of the *'commercialisation of science',* the strategic net set out to generate questions and gather together new understandings of why the market wasn't working for scientific discoveries. These conceptualisations led to the introduction of new practices of connecting and reviewing the scientific-business developments of tenants with a broader group of market actors. Through such encounters new, often shared understandings of markets were generated (i.e. big pharma selling clinical trial services to scientists).

These observations offer useful complementarities to Möller's (2010) theorising of the importance of sense-making and agenda-setting capabilities in strategic nets. We demonstrate how such capabilities are performed in practice through the assembling of new scientific and market knowledge, which is re-presented at conferences, workshops, and in expert panels, as they are questioned and collectively negotiated. Sometimes referred to as *overflowing* and *reframing* (Callon, 1998b), this process creates new ways of understanding the science-market-health landscape and enables new forms of knowing to come to the fore. Overflows are a characteristic of the marketization process. Importantly here, it is the conceptualisation practices established by the strategic net that create overflows, inviting contestation and generation of new conceptualisations (cf. Cochoy & Dubuisson-Quellier, 2013).

These findings deepen extant understandings of the marketization work that strategic nets do by explicating a specific framing brought to it – that of 'pacifying goods' (Çalışkan & Callon, 2010: 5). The pacification of goods is described by Çalışkan and Callon as the work done to put goods into a state where they can be transferred as property. As we saw with the need for tentants to have 'gold plated data' (T#6), connecting specific scientific discoveries to considerations of the broader systems of provision foregrounds the reconceptualising of what needs to be 'pacified' and made stable in the market system and generates new insights for managers working out how to act and intervene. It is difficult to imagine how T#6's 'breakthrough' with 'big pharma' to provide clinical trial services to scientist-entrepreneurs might have been achieved without the coordinated efforts of the strategic net. Conceptualisation practices are thus understood to be generative of the infrastructures necessary for the marketization of scientific discoveries.

Second, our findings have implications for how we understand the practices of the strategic net as constitutive of markets. By conceptualising strategic nets as actor-networks, we can explain how the routinized, recursive practices they perform (e.g. identifying, enrolling, mobilising actors etc.), reproduce the social bonds that organise and order markets and their institutions (Latour, 2005). The conceptualising practices we describe here reproduce *a new* the rules, conventions and instruments that shape how the market calculates what is of value to whom, and how such goods might practically be developed, produced and exchanged (cf. Araujo & Pels, 2015). While this ontology assumes the marketization process as never complete, recognizing markets as always in-the-making (Araujo, 2007), it also tells us something of the role of the strategic net in this process of *becoming*. In both equipping market actors to calculate in new ways, and in providing the mechanisms by which such market devices are continuously re-made (in the interest of innovative scientific discoveries), the strategic net's practices are constitutive of '*the market'*.

The way the term 'the market' is represented, materialised and discursively assembled (Muniesa et al., 2007: 2) through the strategic net's conceptualisation practices, is also informative in helping us understand constitutive nature of conceptualisation practices. Our respondents talked about scientific discoveries: both within markets (e.g. 'health robotics' 'gene therapies', 'e-health'), and across markets (e.g. 'healthcare', 'health futures'), often imagining quite radical changes to healthcare provision by anticipating the collision or convergence between markets and technologies. This 'comfortable shift' (SBC#4) between various scopes and scales in the representation of markets - from narrowly defined 'treatments for inflammatory diseases' to much broader conceptualisations of 'health futures', emerged specifically from the conceptualising practices of the strategic net. Indeed, one could argue that this is exactly what the conceptualisation practices were designed to produce. But, by continuously zooming-in and zooming-out of markets, and by constantly varying the scope and scale of the focus, the strategic net generated market devices that ordered and organised at multiple scales. Thus the conceptualising practices of the strategic net become constitutive of 'health futures'. Seeing strategic nets as constitutive of markets builds on extant understandings of field-shaping (cf. Möller, 2006; Möller, 2010) where markets-as-networks are understood to be transformed through the actions (and interactions) of the various network members (Möller & Svahn, 2009). Additionally, our data suggest that strategic nets are central institutions in the constitution of broader systems such as healthcare provision.

These findings also contribute to strategic studies on the importance of visualising powerful associations between organisations. For example, in their study of six entrepreneurial rivals in the gaming industry, Ozcan and Eisenhardt (2009) found that firms with high-performing portfolios of alliances, visualise their portfolios in the context of an entire business network rather than as a series of single ties. Ozcan and Eisenhardt (2009) argue that this generates a holistic understanding of possible interdependencies among firms, the locations of unconnected firms and the presence of industry uncertainties. Similarly, by continuously mapping, negotiating and remapping broader systems of provision, our strategic net were able to broaden the range of strategic alternatives and enrich the strategic possibilities for scientific discoveries. This raises interesting question about the plasticity of strategic nets.

While we accept Möller, Rajala and Svahn's (2005:1275) definition of strategic nets as, 'intentionally formed networks that contain a finite set of parties, at least three', we observed their plastic nature as different members of the strategic net performed conceptualising practices. For example, as

tenants' discoveries unfolded, different actors within the strategic net were mobilised or backgrounded. Further, while the core members of the net remained quite stable, other actors were temporarily enrolled into its activities before moving on, while yet other market actors remained more distant, connected only through engagements at Summits, roundtables and other networking events. This is a somewhat different understanding of strategic nets. Rather than claiming a stable well-defined value system or recognising an emergent value system such as those associated with radical innovation and change (see for example, Harrison et al., 2010; Möller et al., 2005), it suggests a dynamic conceptualisation of a strategic net, reproduced through its everyday practices.

6.0 CONCLUSION AND MANAGERIAL IMPLICATIONS

6.1 Theoretical Implications

Our study set out not only to identify the types of practices performed by a strategic net to generate new and disruptive market devices, but also to explain how conceptualisation practices influence particular markets and the broader system of provision. In so doing we make three key contributions to the strategic nets literature.

First, our findings contribute to the strategic net literature by presenting some of the first empirical evidence of the practices performed by strategic nets (Möller, 2010). We identified three specific forms of conceptualisation work performed as a central part of the marketization process: 1) the conceptualisation of actors' roles, 2) the conceptualisations of markets, and, 3) the conceptualisation of goods. These findings show the strategic net as a well-positioned and well-equipped institutional form for engaging in marketization, and more specifically conceptualisation work. By drawing on extant research into the sociology of marketing work (Cochoy & Dubuisson-Quellier, 2013), we show how the conceptualisation practices can be strategic, and central to the co-ordinated collective actions that create and develop markets. Additionally the varied and distributed forms of knowledge 'held together' (SBC#4) by the strategic net, continuously enable it to re-conceptualise goods and markets at different scopes and scales.

Second, our findings position the conceptualisation practices of strategic nets as constitutive of markets. This goes further than extant understandings of strategic networks that are said to influence markets (see, Aarikka-Stenroos et al., 2014), and instead claims that the routinized, recursive nature of conceptualisation practices actually becomes part of the market architectures that reproduce social bonds (Latour, 2005) and bridge different communities of practice (Möller & Svahn, 2006). In particular it is through these specific forms of conceptualisation work that strategic nets act to continuously generate new market devices that can calculate, both within and across these communities of practice, the unfolding value of scientific discoveries.

There is an important point here, relating to how we understand the dynamic and unfolding nature of not just scientific discoveries as they are launched into the worlds of markets, but also of the institutional architectures and more specifically, the strategic nets that come to accommodate them. While Möller & Rajala (2007) explicate the basic types of strategic nets they are relatively silent about the network dynamics. However, they suggest that there may be variation in stability of the different forms. While Möller and Svahn (2003: 220) proposed a value system continuum, they concede, "In reality, we will never find completely determined or undetermined systems. … strategic nets 'stretch' across at least two ideal types. Various nets are generally interrelated through actors

having roles in several. This kind of multiple involvements allows innovative companies, through their accumulated knowledge of other relevant actors and their capabilities and liaisons, to create temporal strategic nets for specific development purposes." In other words, strategic nets are constant evolution. We concur with this view, finding that the plastic nature of strategic nets, their ability to morph and alter to accommodate new and emergent market objects, to be central to their ability to recursively reconceptualise markets for scientific discoveries.

Finally, we show how, through its conceptualisation work, the strategic net is able to explore opportunities far beyond commercialisation. By generating conceptualisations of broader systems of provision they are able to pursue a much broader agenda of *the marketization of science* (cf. Möller, 2010). While commercialisation focuses on the transformation of a specific form of scientific knowledge into something that can be made tradeable and valuable to others (Perkmann et al., 2013; Zucker & Darby, 1996), marketization is much broader and includes mapping out and re-imagining markets, the roles of multiple and varied actors and the practices needed to make the broader market system work (cf. Callon, 2016). The need to co-ordinate this purposive, socio-cognitive work ideally positions the strategic net and it's collective of co-ordinated actors, for gathering together, conceptualising and circulating understandings of how a transformed market might be performed (cf. Möller & Rajala, 2007; Möller et al., 2005), and to build powerful associations that put such conceptualisations into practice.

6.2 Managerial Implications

This research offers managers and scientists a greater depth and clarity of understanding of the marketization process in early-stage biotechnology innovation settings. The three-part conceptualizations of collective market action and the work done to create tradeable goods not only highlight the ways in which biotech incubators can become important agents in the advancement of biomedical science, but also offer the necessarily fine-grained knowledge platform for improved management, governance and appraisal of these sites of incubation. For managers of established and new incubators these concepts provide a way of analysing, discussing, planning and reporting on their incubation-supporting activities. For governing boards, investors and governments this gives a clearer framework for the understanding and appraisal of the work done in such settings, not only as it is carried out by the directly employed managers of the incubator, but also the work done by the strategic net. For scientists operating within incubators, or considering where to locate themselves and their embryonic innovations, this offers a way of understanding the practices and processes that they are about to engage in as they consider their move towards the marketization of their ideas, and at the same time a framework for assessing the most suitable incubator setting in which to locate themselves.

For managers and scientists, these findings are also important in that they do not merely provide conceptual labels, but they emphasise the dynamic nature of markets, the interdependency of firms, and therefore the need to continually explore, re-map and re-present their emergent understandings of markets, market action, and the nature of their goods. By drawing out the role of strategic nets in gathering together market knowledge, and the types of strategizing and marketing practices that act to reproduce and reshape markets, we offer both existing and aspirant managers an important lens through which they can better understand and influence strategic market action.

Our findings imply that managers wishing to transform markets can intervene effectively through collective, co-ordinated action, conceptualised through the activities of a strategic net. Findings outline the practices through which effective strategic nets are formed. Managers developing connections and activities that both support and shape policy put themselves in a strong position to identify and co-create effective, market-transforming strategic nets. Additionally, findings identify and describe the types of marketing and strategizing practices that managers should engage in if their intent is to transform markets. By being part of a strategic net that gathers together key and emergent market knowledge and expertise from diverse market actors (often found outside or on the edges of a field), managers are well-positioned to effect changes in market architectures. But managers also need to consider the dynamics of markets in conjunction with their strategic net's activities, enabling one to inform and unfold the other. Exploring, re-mapping and re-presenting of emergent interdependency - not just between firms and markets but between interconnected networks of firms performing, reproducing and reshaping markets - offers a fundamentally different lens for managers attempting to understand and influence strategic market action.

Understanding the value of strategic nets and their capacity to transform markets through the conceptualising practices they perform, also has important policy implications. The Stevenage BioScience Catalyst, like many science and technology incubators and accelerators world-wide, benefited from significant government funding. Our findings suggest that conceptualisation practices can play an important role in reconstituting markets for innovation. This has important implications for policy makers as it suggests that the way we value strategic net practices, needs to take into account their constitute contribution to market innovation and transformation. This might shed a very different light on value of such initiatives than current evaluations allow. While such is beyond the scope of this study, it suggests an important area for further research.

6.3 Limitations and Future Research

Our findings have limitations and implications for further study. Life Science is generally a slow business. The findings presented here focus on the conceptualisation work that a strategic net performs largely because, despite the 18-month period over which our data collection extended, no new products from the biotech start-ups were launched onto the market. This is not surprising, given the historical drug development patterns of this sector, or that we were studying the activities of an 'incubator' (rather than an accelerator or science park that supports more advanced science). However, this observation foregrounds the need for further longitudinal studies in biotechnology to enable researchers to generate a more comprehensive map of marketization, from conceptualisation to market transformation to the connections between multiple markets as they unfold the broader systems of health provision.

We also need studies that examine the relationships of strategic nets and marketization beyond the biotechnology sector. By studying other industries and market settings we will be able to develop a much fuller picture of the marketization process. Such studies are not feasible for the lone researcher, but present important opportunities for multi- and inter-disciplinary research teams engaged in extended, longitudinal research programmes. Such studies are likely to generate insightful and valuable understandings of the marketization process and the activities of managers and other key actors as they collectively shape this process.

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