Paper presented at the ISA - RC52 Interim Conference: Professions, Bonds and Boundaries at the Università Cattolica del Sacre Cuore, Milan, March 19-21, 2015

Professionals, policy arenas, and technological change

Jacob Hasselbalch
Erasmus Mundus Doctoral Fellow
University of Warwick & Université Libre de Bruxelles
E-mail: j.a.hasselbalch@warwick.ac.uk
Web: www.warwick.ac.uk/jhasselbalch

Abstract:

The purpose of this paper is to investigate the role played by professions and professionals in mediating the impact of technological change between the institutions of the state and market in both national and transnational domains. I challenge the idea of professions as a 'third logic' operating between states and markets by developing the concept of the policy arena – a site of professional interaction around the regulatory regimes that set the boundaries of states and markets. I draw on the concepts of institutional work, linked ecologies, and organizational fields to make the point. Following this, I consider how technological change, in the form of disruptive innovation, impacts the nature of professional interaction in policy arenas. I argue that technological change is an endogenous social process through which professionals challenge existing frames of issue areas and work tasks to their own advantage. This dynamic is important to understanding a number of regulatory puzzles, especially in the transnational domain. The investigation contributes to a closer union between international political economy and the sociology of professions.

KEY WORDS
Technological change, disruptive innovation, professions, ecologies, policy arenas

Introduction

The purpose of this paper is to investigate the role played by professions and professionals in mediating the impact of technological change between the institutions of the state and market in both national and transnational domains. Professions can be seen as a 'third logic' operating between the state and the market (Freidson 2001) – a third ideal type of organizing work in addition to markets and hierarchies. A core tenet of the field of political economy is that states and markets co-constitute each other over time (see for example Polanyi, 1944). As markets grow more complex, so does the bureaucracy needed to oversee them – vice versa, bureaucracies can wield new powers at their disposal to unlock new markets or create the conditions allowing markets to grow. The engine that drives this co-constitution in the long run is technological change – an idea first put forward by Marx but echoed in various ways by numerous scholars in the discipline since (Veblen 1934; Schumpeter 1942; Cox 1981). In political economy, these things tend to be studied on the grand scale and over longer time spans. Technology comes to be seen as a variable independent of the people and social context in which it exists; but technologies do not exist in a vacuum and do not magically and suddenly alter the status quo. They are inherently social in the ways actors understand and deploy them, and the work of inventing, innovating and diffusing technologies is the prerogative of the professions. The system of professions and professionals are hence key to figuring out how the micro-scale motor of state-market co-constitution functions. They are the individual cogs and gears that drive the machinery of the market society.

The question of how professions and professionals mediate the impact of technological change between state and market feeds into a broader research agenda that I am developing in a dissertation on the political economy of disruptive innovation. I focus on disruptive innovation, a term from the management literature (Bower & Christensen 1995; Christensen 1997), rather than technological change. Technological change is often understood as a more gradual and longer-running process operating on the societal level, whereas disruptive innovation emphasizes

fast-moving and unexpected change in specific sectors of the economy. Disruptive innovations immediately imply specific market changes in a way that the more neutral idea of technological change does not. But disruptive innovations are also political; their potential for widespread societal consequences raise redistributive or moral concerns, resulting in calls for regulatory oversight, control and involvement in the issue.[1] In the management literature, recent books have looked into the prospects for disrupting healthcare and education (Christensen et al. 2009; Christensen et al. 2011), leading to criticism in the media about the limits and ethics of disruption (Lepore 2014). Regulation and innovation are therefore interlinked, one often creating the conditions for the other, in the same way that the state and market co-constitute each other on the macro-scale. The core insight of this paper is to see the work of regulation as a site of professional interaction and competition that involves not only regulators, but also other professionals representing firms, NGOs, universities, think tanks, and so on. A growing amount of this work takes place in the transnational domain. The purpose of the paper is to look more closely at how technological change, in the form of disruptive innovation, impacts the way professionals play the regulatory game.

I structure this investigation into two parts. First, I develop the concept of the policy arena, a field of professional interaction on regulatory issues, as the ontological unit of analysis on which the study focuses. Second, I discuss how to conceptualize technology and disruptive innovation in terms that make them visible and understandable in policy arenas. The purpose of the investigation is to position the sociology of professions and professionals as a useful frame for studying issues of transnational market regulation, thereby developing novel research on the intersection of international political economy and sociology. By doing so, I aim to demonstrate that such a frame is especially well suited to studying the unique policy problems caused by disruptive innovation, while exploring the relationship between professions and technology.

[1] I understand regulation as a social process, defined by Selznick (1985, pp.363–364) as 'sustained and focused control exercised by a public agency over activities that are valued by a community'.

Policy arenas

It is hard to come by any formal definition of a policy arena, but the term is generally used to describe the *site* of policymaking, simultaneously implying specific political actors and institutions, the availability of policy alternatives, and problem or issue areas, as in Kingdon's (1984) 'policy streams' framework.[2] In political science, actors are generally grouped in mass terms according to their organizational affiliations. Classical works in political science endow actors with pre-determined material interests that are given by their organizational affiliation, aggregate similar actors into interest groups, and explain change by reference to the distribution of resources and power among different interest groups (Schattsneider 1960; Dahl 1961; Lindblom 1977). Constructivism has emerged as a powerful alternative, especially in international politics, by focusing on the roles of ideas and discourse rather than pre-determined material interests. Here, change is explained by reference to the power of ideas and norms in mobilizing actors and challenging frames of understanding (Adler 1997; Finnemore & Sikkink 1998; Ruggie 1998). Whether you emphasize the role of interests or ideas, there is certainly a tendency in political science and its related disciplines such as international relations and political economy to study actors in neatly defined mass terms, as interest groups, organizations, states, or firms. In political economy, social action between these groups consists of the negotiation of boundaries between states and markets, promoting or resisting the encroachment of one into the other.

A sociological challenge to this idea would begin by breaking down the artificial barrier between state and market, to make professional competition the main driver of social action in these areas. There are several advantages to such an endeavour. First of all, social action would be conceived of in ecological terms rather than economic or mechanistic terms. The Chicago School of sociology employed the idea of ecologies as an intermediate concept between agents and structures (Goffman 1963; Hughes 1971) – as 'interactions between multiple elements that are neither fully constrained nor fully independent' (Abbott 2005, p.248). The idea presumes a

[2] Alternatively called the 'policy window' or 'multiple streams' framework.

biological analogy to explain social systems rather than an economistic or physical one, the advantage of which is to 'transcend general linear reality' (Abbott 2001e) – which is to say that rather than focus on variables and main causes, ecologies focus on subjects and events (Abbott 2001b). Such an approach coheres better with recent advances in adapting insights from complexity theory and complex adaptive systems to the social sciences (Mitchell 2009; Byrne & Callahan 2014).

There are several examples of professions being invoked to explain how they co-constitute states on the one hand and markets on the other, lending strength to the notion that there is a good case for theorizing professions more centrally as a driver of state-market co-constitution. On the state-professions side, Abbott (1988) highlights the role of the state in granting and protecting through law the jurisdictions of lawyers and doctors, for example; Cooper & Robson (2006) demonstrate the growing importance of accounting firms in supporting the regulatory processes of the state; and Johnson (1972) has shown how accounting professionals supported the expansion of the British empire into new colonies. On the market-professions side, Mennicken (2010) charts the co-evolution of auditing and marketization in post-Soviet Russia; Fourcade & Khurana (2013) reveal a similar process driving changes in business education and markets in the U.S.; and Lebaron (2001) discusses the central role played by economists in constructing and facing the crisis in France in December 1995.

An important side to this story is the recent attention to how professional work increasingly transcends the boundaries of the nation-state and domestic markets, leading to calls for a transnational sociology of the professions (Faulconbridge & Muzio 2012). Thus, the professions are now seen as central to explaining a range of issues in global governance and international political economy, such as: capital account liberalization in emerging markets (Chwieroth 2007), knowledge networks in the World Bank (Stone 2013), financial reform (Seabrooke & Tsingou 2014a), and demographic change (Seabrooke & Tsingou 2014b). This trend speaks to the centrality of professions and professionals in organizing various aspects of modern societies,

even in areas where nation-states and domestic markets – the traditional domains of the professions – cannot reach. Thus, it suggests that the professions and the increasingly large and global organizations in which they reside are not only being affected by globalization, but are also helping to drive it (Suddaby et al. 2007).

A theory of the professions as the driver of state-market dynamics will have to go above and beyond the one proposed by Freidson (2001), where professions are reduced to an ideal-typical 'third logic' on a level with hierarchies and markets. Freidson's notion faces considerable challenge in the era of globalization, where the 'historical regulatory bargain between professional associations and nation states is being superseded by a new compact between conglomerate professional firms and transnational trade organizations' (Suddaby et al. 2007, p.334). This new compact relies less on normative principles of professional elitism, and more on neo-liberal principles of market economics (p. 334). My project here is different: rather than support the idea of three ideal types, I aim to show how states and markets themselves derive from the various ways professional life has been organized in modern societies, and how this is increasingly becoming a transnational project. This idea will be expressed through the concept of the policy arena.

I take my point of departure in relational sociology (Emirbayer 1997), which underpins much of the literature on professions. Relational thinking is best explained by reference to its opposite: substantialist thinking. Substantialist thinking presupposes the existence of entities of various kinds (things, beings, essences) as the fundamental units of inquiry. Entities, be they actors or structures, are endowed with various characteristics in the form of variables, and social analysis proceeds by studying changes in these variable properties. In contrast, relational thinking takes its starting point in interaction where 'the very terms or units involved in a transaction derive their meaning, significance, and identity from the (changing) functional roles they play within that transaction' (p. 287). This mode of thinking makes dynamic, unfolding processes the primary units of analysis rather than the constituent elements themselves. Thus, we should look

for things of boundaries instead of boundaries of things – in other words, 'boundaries come first, then entities' (Abbott 1995, p.860).

The co-constitution of state and market can be analysed in both substantialist and relational terms. The founders of sociology and political economy thought about the process as relational. Marx (1977, p.932) was concerned with the emergence and transformation of capitalism, and expressed himself in deeply relational terms: 'capital is not a thing, but a social relation between persons which is mediated through things'. Similarly, Polanyi (1944) did not take the existence of the market for granted, but presented a historical analysis of the emergence of market society and analysed the various ways markets and states changed over time by virtue of their interaction. However, more recent works show a divide between relational and substantialist modes of thought. For example, Cox (1981, p.127) criticizes the singular concept of the state in international relations ('a state was a state was a state') and brings attention to the ways that ideas, institutions and material capabilities dynamically shape each other over time. On the other hand, Gilpin (1987) takes a more substantialist line by highlighting the causal significance of pre-given entities such as the Bretton Woods system and NATO in cementing the status of a hegemonic nation-state – his system naturally goes toward equilibrium and stasis, not dynamism.

If the co-constitution of state and market can be seen both relationally and substantially, what are the advantages of relational thinking? As I am interested in the role of professionals in the processes that play out in the policy arena – specifically, the processes of technological disruption and subsequent regulatory appraisal and adjustment – a relational approach is better suited to narratively trace and follow the process through its duration. In contrast, a substantialist account would take snapshot views of the entities, frozen in time, and read off their variable characteristics for the purposes of analysis. As the role of individual actors such as regulators, lobbyists, activists and so on is uncertain and open to contestation, there are no grounds for assuming fixed characteristics of the actors or lumping them together in pre-given aggregate terms. Rather, identities, meanings and groupings will emerge through transactions in the field.

By 'field' I mean to say that the policy arena is an organizational field. Scott (1995, pp.207–209) defines an organizational field as connoting 'the existence of a community of organizations that partakes of a common meaning system and whose participants interact more frequently and fatefully with one another than those actors outside the field'. The term is commonly deployed in studies of market organizations such as accounting firms (e.g. Suddaby et al. 2007; Robson et al. 2007), where organizational fields thus consist of competitors, regulators, suppliers and consumers that make up a recognized area of organizational life (Powell & Dimaggio 1983, p.148). Organizational fields need not be restricted to the domain of market organizations, though. Seeing the policy arena as an organizational field means to not only look at the regulators of a specific policy issue, but also the various actors with which they 'frequently and fatefully' interact: staff from other regulatory agencies, politicians, lobbyists, think tanks, activists, journalists, and so on. In other words, these are the professionals of the policy arena. They are individuals making careers in the issue areas and related organizational fields of specific policy problems, with or without the help of more structured professional associations. Their claim to participation in the policy arena is their expertise (Seabrooke 2014). It therefore makes sense to complement the sociology of professions with the sociology of expertise (Eyal 2014). This definition is also fluid enough to apply equally to domestic settings and transnational settings. We might expect the roles of professionals in transnational settings to be more important due to the 'thin' nature of the transnational domain as opposed to the 'thick' domestic domain, where jurisdictions are already populated and defended, leaving less scope for professionals to emerge and control issues (Seabrooke 2014; Seabrooke & Tsingou 2014b).

Organizational fields are relationally defined. They are given by the interactions between individuals carrying out 'institutional work' – that is, the 'purposive action of individuals and organizations aimed at creating, maintaining and disrupting institutions' (Lawrence & Suddaby 2006, p.215). In this view, regulatory regimes are institutions, and the daily work practices of participants in the field revolve around these regimes. This definition encompasses both a policy

officer in the European Commission working on an impact assessment, and an industry-hired public affairs consultant meeting with members of the European Parliament. Both can be equally said to be carrying out institutional work on specific regulatory regimes that they are either promoting or challenging. We cannot pre-determine the boundaries of policy arenas, in the same way that we cannot pre-determine the boundaries of an organization: 'An organization is a set of transactions that are later linked into a functional unit that could be said to be the site of these transactions' (Abbott 1995, p.860). Similarly, policy arenas are given by reference to the transactions between participants who could be said to be creating, maintaining, and disrupting particular regulatory regimes, and the site of the policy arena is the spatio-temporal location in which these practices take place.

It is therefore clear that policy arenas are also ecologies. Abbott (2005, p.248) describes an ecology as comprised of a set of actors, a set of locations (work tasks), and processes of ligation that connect actors to locations. While the policy arena itself can be thought of as a coherent ecology with competition and cooperation among its constituent parts to control work tasks (the creation, maintenance, or disruption of regulatory regimes), the constituent parts are themselves simultaneously located in other ecologies that link up, overlap and interpenetrate each other. The strength of the linked ecologies approach is this ability to handle complex social relationships on multiple scales by placing emphasis 'on the modes and processes of mediation and co-production *between* different arenas or fields' (Mennicken 2010, p.335, emphasis in original). A core part of the analysis of policy arenas, therefore, has to do with understanding why *these* particular actors come together in *these* particular circumstances, why they are connected to the regulatory regime in question, and how they co-constitute each other.

The idea of yoking together professions and institutions is not new: Dimaggio (1991) has suggested that the co-evolution of professions and the state may be considered one of the primary engines of institutional change. More recently, Suddaby & Viale (2011) describe the professional project as an endogenous mechanism of institutional change, leading to recent work

towards developing an institutionalist sociology of the professions (Muzio et al. 2013). What is new is to adapt the idea to political economic analyses of the mutual impacts between states and markets, innovations and regulation. Although there are exceptions, the tools generally available to political economists overlook the micro-scale interactions between professionals in the international political economy that the sociology of professions describe in detail. What I suggest here is to shift the focal length of the analytical lenses to investigate the detail of what goes on in policy arenas. This means doing away with the traditional state-market distinction. What we are left with is a collection of individuals, who by virtue of their training and organizational situation we label professionals, and whose transactions with other professionals make up all phenomena of the international political economy. States and markets do not co-constitute each other because they cannot act – rather, it is the actions of professionals in policy arenas that construct the boundaries and structures of the aggregate bodies of social relations that we have come to label the state and the market. But at the base level of analysis of political economy and to the extent that our task is to illuminate the workings of this level, we should focus on professionals.

Technology and disruption

Having described the ontology of policy arenas, I turn to the question of how technological change, in the form of disruptive innovation, impacts them. I have argued that disruptive innovation (Bower & Christensen 1995; Christensen 1997) is a useful term that highlights the important role of technological change in driving market-based competition. When talking about disruptive innovation rather than technological change as such, attention is brought especially to the economic context of the innovation, but also on wider societal and political implications. Disruptive innovations such as electronic cigarettes or hydraulic fracturing are economic game-changers, but wider breakthroughs depend upon their social acceptance and regulatory environments, both of which are contested and uncertain. Technologies are always co-

constructed with their economic, social and political environments (Latour 1993), and it is important to consider the context of technology as much as the instrumental or functional aspects of the technology itself. For instance, the fate of innovations is often in the hands of social mobilizations, as has been demonstrated with the success of the craft brewing industry and the troubles faced by pharmaceutical companies in Germany in the face of anti-biotechnology activism (Rao 2009).

Technologies enter fields not as events, but as 'turning points' (Abbott 2001c). With any given technology, it is difficult to point at a precise point in time at which it can be said that the technology was invented. Abbott (2001d) demonstrates this with the example of the invention of the grenade harpoon. While the invention of the grenade harpoon is credited to Svend Foyn's 1870 patent, this obscures the presence at the time of many contending designs of grenade harpoons from other inventors that were experimented with and put to use in all parts of the whaling industry. To say that the grenade harpoon was invented by this person on this date is more of a historical fact (Carr 1961) than a reflection of the lived experience of 19th century whalers. The diffusion of inventions and innovations are processes with temporal durations that play out in social interaction (Rogers 2003; Wejnert 2002) – it does not make sociological sense to equate inventions with events. A more fitting description comes in the form of Abbott's (2001c) 'turning points'. Rather than think about technological change as a discrete, abrupt event that is exogenous to the social process, turning points consider the convergence of simultaneously running endogenous social processes that align just so, 'like the tumblers of a lock' (p. 256), to allow previously stable conditions to be overturned. This emphasis on the social context of invention and innovation is also more in line with the everyday practices of scientific work (Latour 1988).

The entrance of technological change by disruptive innovation into social settings can be thought of as a case of 'punctuated cooperation' (Vollmer 2013). Vollmer argues that we should focus less on the disruptive event and more on 'tracing disruptiveness', because 'any collective

impressed by a disruption is first and foremost impressed within a social situation' (p. 22). To trace disruptiveness, Vollmer refers to Whitehead (1929, pp.30, 50) and Abbott (Abbott 2001d, p.232) in calling for an extended understanding of social situations as a 'nexus of actual occasions'. Disruption is not an objective, exogenous event, but an endogenous reconfiguration in social order that plays out through processes of social interaction. It passes *through* turning points rather than instigating them from outside the social context. To understand it, we must focus on how individuals recognize disruption, how they enact it, and how these in turn transform social order. Vollmer (2013, pp.60–62, 69) argues that 'framing' (Goffman 1974) is a key mechanism by which disruptions create the context of social situations, and these frames can lead to punctuated cooperation 'in which participants lose a previously established level of cooperation in maintaining expectations'.

This leads to the question of how actors attempt to solve problems of disrupted coordination. Vollmer suggests that actors draw on either normative, cognitive or relational keys in order to craft strategies that allow coordination equilibria to be re-established (Vollmer 2013, pp.47–62). Normative keys have to do with norms, customs or morality; cognitive keys with knowledge, competence or taste; and relational keys with membership, status or reputation. While this relates to any social situation, it is particularly evident in the system of professions due to their relatively large endowments of symbolic, cultural and social capital that lets them deploy these keys effectively. This framework coheres well with other approaches in the sociology of professions to studying how competitions for work tasks are decided. Abbott's 'linked ecologies' (2005) framework could thus be said to emphasize relational keys (in the form of hinges, alliances, and avatars), while Seabrooke's (2014) 'epistemic arbitrage' emphasizes cognitive keys. Drawing on a number of empirical examples, Vollmer (2013, p.106) finds that normative and relational keys seem more significant in re-establishing coordination, probably due to the fundamental uncertainty of many disruptions which makes it easy to challenge cognitive claims.

Two concrete examples of technological change in professional and organizational fields provide an illustration of the processes to take note of. I will draw on a study of transformations in audit technologies (Robson et al. 2007) and another on the computerization of physics experiments (Galison 1997). The audit study concerns the emergence of Business Risk Audit (BRA) methodologies: audit techniques that 'incorporate client-firm strategy and business risk into the assessment and planning of audit risk' (p. 409). During the 1990s, large audit firms started offering BRA in an effort to modernize audit and regain prestige (p. 411). In addition to the statutory audit requirements, the large audit firms started fulfilling a more advisory role, leading to changes in the identity of the audit profession. BRA should hence be understood as an internal professionalization project to change the institutions of audit in ways that provide greater professional rewards. It is an example of technology-driven professionalization as endogenous institutional change (Suddaby & Viale 2011). In this example, BRA caused the framing of audit to shift from traditional, statutory requirements to a more risk-oriented, business advisory role – causing a shift in the relative value of keys throughout the field. Audit firms and professionals who could not deploy the normative, cognitive or relational keys necessary to signal a shift in audit technologies were at a risk of being marginalized in the field.

In the computerization of physics experiments (Galison 1997), a different logic is at work. Owing to the increasing complexity of physics and technological advances in computers, computerization became a necessary step in the evolution of physics as a field. This was not a professionalization project of the physicists, however – they were left on the outside looking in on the changing definition of what constituted a physics experiment, suffering a simultaneous lack of control (p. 2). Physicists had to cede ground to engineers, who understood the intricacies of calibrating the new instruments of experimentation. In order to cooperate, physicists and engineers had to develop a shared language, a pidgin or creole, of new terms that allowed them to communicate across disciplinary divides (p. 47, 803). This ultimately brought about and exacerbated the cleft between experimental and theoretical physics. In this example, advances in

computerization changed the frame of how physics experiments were understood and conducted. The new frame opened new areas of work which required a different set of cognitive keys to undertake, leading to a disruption and realignment through relational and normative keys.

It therefore seems necessary to distinguish between two types of technological change in organizational fields. Change from within the field as a professionalization project (Suddaby & Viale 2011), and change from outside the field, where professions within the field are often put in a reactionary position. The two examples demonstrate a complex relationship between frames and keys: frames determine the relative value of keys, but the distribution of keys in a field determine who can institute new frames or challenge existing ones. Struggles over framing are therefore struggles over the respective values of social resources of the participants, and ultimately a struggle over the social structure of the field (Vollmer 2013, p.137). As to whether technological changes and disruptive innovations drive this process or are reflections thereof, the answer seems to be both – or rather, a question of where you set the boundaries of analysis. In the audit example, BRA is a professionalization project of the auditors, but a disruption if you shift perspective and consider management consultancy firms who are suddenly faced with new, unexpected competitors. In the physics example, computerization is a disruption to the physicists, but a professionalization project of the engineers who can expand the domain of their work to new fields.

The technological impact 'travels' through linked ecologies. Changes outside the organizational field under scrutiny are still endogenous to the social process by virtue of the linked ecologies the participants are situated in. Crucially, from these examples it seems that the social and professional uses of technological change in general is what allows changes in the links and overlaps between ecologies. We might envision these changes as occurring through the following sequence of social processes, one leading logically to the next: (1) expectations are disrupted by technological change; (2) this introduces new participants and/or new frames of work tasks; (3) subsequently blurring the boundaries between and identities of existing

participants; (4) leading to a scramble to reorient expectations through re-keying cooperation (normatively, cognitively, or relationally). Technological change is therefore key to understanding why what used to be a more clearly bounded system of professions is becoming increasingly chaotic (Abbott 2001a; Rosa 2013).

Conclusion

In this paper, I have considered how the professions can be seen as mediating the impact of technological change, in the form of disruptive innovation, between state and market. In the first part of the paper, I argued that the professions are central to understanding how the institutions of state and market co-constitute each other on the micro-level by paying attention to professional interaction in policy arenas – the exact sites where the boundaries of state and market are negotiated in either national or transnational terms. I developed the concept of the policy arena by drawing on literature concerning organizational fields, linked ecologies and institutional work. Having provided a fuller understanding of policy arenas, I turned to the question of how to describe disruptive innovation in terms that make its impact visible and understandable. Here I referred to turning points and punctuated cooperation as preliminary theoretical hooks that provide traction on the issue by making disruption an endogenous social process that is clearly linked to professionalization projects and competitions over frames and the respective value of social resources.

The next steps are to put the theories to use by examining their empirical purchase on real-world cases of disruptive innovation and interaction in policy arenas. There is much that suggests that such an undertaking might bear fruit. Struggles over framing and the respective value of social resources are obvious in EU policy arenas dealing with disruptive innovations.[3] For example, in the regulatory debate over hydraulic fracturing, the frame of environmental risks rather than energy opportunity has been cemented by an alliance between activists, NGOs and

[3] Based on observations from 21 interviews with participants in the policy arenas of 60 to 90 minutes in length.

the Directorate-General for Environment, deploying normative keys that the energy industry cannot contest with cognitive keys. Concerning electronic cigarettes, MEPs that built alliances with communities of electronic cigarette users could deploy normative keys in Parliament that framed the issue in life-and-death terms to contest and overturn a number of dry, technical limitations. It seems that there are grounds to believe that in the regulation of disruptive innovation, normative and relational keys matter more than cognitive ones as Vollmer also suggests in the above. More work has to be done to consider how keys and frames interact, and how the power to shape that interaction is attained. Such insights will be crucial to developing a better understanding of the relationship between disruptive innovation, professional interaction, and policy arenas.

References

Abbott, A., 2001a. *Chaos of Disciplines*, Chicago & London: University of Chicago Press.

Abbott, A., 2001b. From Causes to Events. In *Time Matters: On Theory & Method*. Chicago & London: University of Chicago Press, pp. 183–205.

Abbott, A., 2005. Linked Ecologies: States and Universities as Environments for Professions. *Sociological Theory*, 23(3), pp.245–274.

Abbott, A., 2001c. On the Concept of Turning Point. In *Time Matters: On Theory & Method*. Chicago & London: University of Chicago Press, pp. 240–260.

Abbott, A., 2001d. Temporality and Process in Social Life. In *Time Matters: On Theory & Method*. Chicago & London: University of Chicago Press, pp. 209–239.

Abbott, A., 1988. *The system of professions: An essay on the division of expert labor*, University of Chicago Press.

Abbott, A., 1995. Things of Boundaries. *Social Research*, 62(4), pp.857–882.

Abbott, A., 2001e. Transcending General Linear Reality. In *Time Matters: On Theory & Method*. Chicago & London: University of Chicago Press, pp. 37–63.

Adler, E., 1997. Seizing the Middle Ground: Constructivism in World Politics. *European Journal of International Relations*, 3(3), pp.319–363. Available at: http://ejt.sagepub.com/cgi/doi/10.1177/1354066197003003003 [Accessed October 31, 2014].

Bower, J.L. & Christensen, C.M., 1995. Disruptive technologies: catching the wave. *Harvard Business Review*, pp.43–53.

Byrne, D. & Callahan, G., 2014. *Complexity Theory and the Social Sciences: The State of the Art*, London: Routledge.

Carr, E.H., 1961. *What is History?*, New York: Vintage Books.

Christensen, C.M., 1997. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*, Harvard Business School Press. Available at: http://books.google.co.uk/books?id=SIexi_qgq2gC.

Christensen, C.M., Grossman, J.H. & Hwang, J., 2009. *The Innovator's Prescription*, McGraw-Hill.

Christensen, C.M., Johnson, C.W. & Horn, M.B., 2011. *Disrupting Class* 2nd ed., McGraw-Hill.

Chwieroth, J., 2007. Neoliberal economists and capital account liberalization in emerging markets. *International organization*, 61(02), pp.443–463.

Cooper, D.J. & Robson, K., 2006. Accounting, professions and regulation: Locating the sites of professionalization. *Accounting, Organizations and Society*, 31, pp.415–444.

Cox, R., 1981. Social Forces, States and World Orders: Beyond International Relations Theory. *Millennium: Journal of International Studies*, 10(2), pp.126–155.

Dahl, R.A., 1961. *Who Governs? Democracy and Power in an American City*, New Haven: Yale University Press.

Dimaggio, P.J., 1991. Constructing an organizational field as a professional project: US Art Museums, 1920-1940. In W. W. Powell & P. J. Dimaggio, eds. *The New Institutionalism in Organizational Analysis*. Chicago: University of Chicago Press, pp. 267–292.

Emirbayer, M., 1997. Manifesto for a Relational Sociology. *American Journal of Sociology*, 103(2), pp.281–317.

Eyal, G., 2014. For a Sociology of Expertise: The Social Origins of the Autism Epidemic. *American Journal of Sociology*, 118(4), pp.863–907.

Faulconbridge, J.R. & Muzio, D., 2012. Professions in a globalizing world: Towards a transnational sociology of the professions. *International Sociology*, 27(1), pp.136–152.

Finnemore, M. & Sikkink, K., 1998. International Norm Dynamics and Political Change. *International Organization*, 52(4), pp.887–917.

Fourcade, M. & Khurana, R., 2013. From social control to financial economics: the linked ecologies of economics and business in twentieth century America. *Theory and Society*, 42(2), pp.121–159. Available at: http://link.springer.com/10.1007/s11186-012-9187-3 [Accessed January 20, 2014].

Freidson, E., 2001. *Professionalism: The Third Logic*, Chicago: University of Chicago Press.

Galison, P., 1997. *Image and Logic: A Material Culture of Microphysics*, University of Chicago Press. Available at: http://books.google.be/books/about/Image_and_Logic.html?id=spKxQgAACAAJ&pgis=1 [Accessed November 2, 2014].

Gilpin, R., 1987. *The Political Economy of International Relations*, Princeton: Princeton University Press.

Goffman, E., 1963. *Behavior in Public Places*, New York: Free Press.

Goffman, E., 1974. *Frame Analysis: An Essay on the Organization of Experience*, Cambridge: Harvard University Press.

Hughes, E.C., 1971. *The Sociological Eye. Part III: Work and Self*, Chicago: Aldine.

Johnson, T.J., 1972. *Professions and Power*, London: Macmillan.

Kingdon, J.W., 1984. *Agendas, Alternatives, and Public Policies*, Boston: Little, Brown.

Latour, B., 1988. *Science in Action*, Harvard University Press.

Latour, B., 1993. *We Have Never Been Modern*, Harvard University Press.

Lawrence, T.B. & Suddaby, R., 2006. Institutions and Institutional Work. In S. R. Clegg et al., eds. *The SAGE Handbook of Organization Studies*. London: SAGE Publications.

Lebaron, F., 2001. Economists and the economic order: The field of economists and the field of power in France. *European Societies*, 3(1), pp.91–110.

Lepore, J., 2014. The Disruption Machine: What the Gospel of Innovation Gets Wrong. *The New Yorker*. Available at: http://www.newyorker.com/magazine/2014/06/23/the-disruption-machine.

Lindblom, C.E., 1977. *Politics and Markets: The World's Political Economic Systems*, New York: Basic Books.

Marx, K., 1977. *Capital, volume 1*, New York: Vintage Books.

Mennicken, A., 2010. From inspection to auditing: Audit and markets as linked ecologies. *Accounting, Organizations and Society*, 35(3), pp.334–359. Available at: http://dx.doi.org/10.1016/j.aos.2009.07.007.

Mitchell, M., 2009. *Complexity: A Guided Tour*, New York: Oxford University Press.

Muzio, D., Brock, D.M. & Suddaby, R., 2013. Professions and Institutional Change: Towards an Institutionalist Sociology of the Professions. *Journal of Management Studies*, 50(5), pp.699–721. Available at: http://doi.wiley.com/10.1111/joms.12030 [Accessed April 29, 2014].

Polanyi, K., 1944. *The Great Transformation: The Political and Economic Origins of Our Time*, Beacon Press. Available at: http://books.google.co.uk/books?id=Vgli4QUSOk8C.

Powell, W.W. & Dimaggio, P.J., 1983. The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48, pp.147–160.

Rao, H., 2009. *Market Rebels: How Activists Make or Break Radical Innovations*, New Jersey: Princeton University Press.

Robson, K. et al., 2007. Transforming audit technologies: Business risk audit methodologies and the audit field. *Accounting, Organizations and Society*, 32, pp.409–438.

Rogers, E.M., 2003. *Diffusion of Innovations* 5th editio., New York: Simon and Schuster. Available at: http://books.google.co.uk/books?id=9U1K5LjUOwEC.

Rosa, H., 2013. *Social Acceleration: A New Theory of Modernity*, Columbia University Press.

Ruggie, J.G., 1998. What makes the world hang together? Neo-utilitarianism and the social constructivist challenge. *International organization*, 52(4), pp.855–885.

Schattsneider, E.E., 1960. *The Semi-Sovereign People: A Realist's View of Democracy in America*, New York: Holt, Rhinehart and Winston.

Schumpeter, J.A., 1942. *Socialism, capitalism and democracy*, Harper and Brothers.

Scott, W.R., 1995. *Institutions and Organizations*, London: Sage.

Seabrooke, L., 2014. Epistemic Arbitrage: Transnational Professional Knowledge in Action. *Journal of Professions and Organization*, 1(1), pp.49–64.

Seabrooke, L. & Tsingou, E., 2014a. Distinctions, affiliations, and professional knowledge in financial reform expert groups. *Journal of European Public Policy*, 21(3), pp.389–407. Available at: http://www.tandfonline.com/doi/abs/10.1080/13501763.2014.882967 [Accessed March 11, 2014].

Seabrooke, L. & Tsingou, E., 2014b. Professional emergence on transnational issues: Linked ecologies on demographic change. *Journal of Professions and Organization*, Advance Ac. Available at: http://jpo.oxfordjournals.org/content/early/2014/10/16/jpo.jou006.full.

Selznick, P., 1985. Focusing Organizational Research on Regulation. In R. G. Noll, ed. *Regulatory Policy and the Social Sciences*. Berkeley and Los Angeles: Univ. of California Press, pp. 363–367.

Stone, D., 2013. "Shades of grey": the World Bank, knowledge networks and linked ecologies of academic engagement. *Global Networks*, 13(2), pp.241–260. Available at: http://doi.wiley.com/10.1111/glob.12007.

Suddaby, R., Cooper, D.J. & Greenwood, R., 2007. Transnational regulation of professional services: Governance dynamics of field level organizational change. *Accounting, Organizations and Society*, 32, pp.333–362.

Suddaby, R. & Viale, T., 2011. Professionals and field-level change: Institutional work and the professional project. *Current Sociology*, 59(4), pp.423–442. Available at: http://csi.sagepub.com/cgi/doi/10.1177/0011392111402586 [Accessed April 29, 2014].

Veblen, T., 1934. *The Theory of the Leisure Class*, New York: Modern Library.

Vollmer, H., 2013. *The Sociology of Disruption, Disaster and Social Change: Punctuated Cooperation*, Cambridge: Cambridge University Press.

Wejnert, B., 2002. Integrating Models of Diffusion of Innovations: A Conceptual Framework. *Annual Review of Sociology*, 28(1), pp.297–326. Available at: http://www.annualreviews.org/doi/abs/10.1146/annurev.soc.28.110601.141051 [Accessed January 20, 2014].

Whitehead, A.N., 1929. *Process and Reality. An Essay in Cosmology*, New York: Macmillan.