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Forthcoming in Economic Geography[1]

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Abstract

Evolutionary approaches in economic geography face questions about the relationships between their concepts, theories, methods, politics and policy implications. Amidst the growing but unsettled consensus that evolutionary approaches should employ plural methodologies, the aims here are, first, to identify some of the difficult issues confronting those working with different frameworks. The concerns comprise: specifying and connecting research objects, subjects and levels; handling agency and context; engaging and integrating the quantitative and the qualitative; comparing cases; and, considering politics, policy and praxis. Second, the purpose is to articulate a distinctive geographical political economy approach, methods and illustrative examples in addressing these issues. Bringing different views of evolution in economic geography into dialogue and disagreement renders methodological pluralism a means towards improved understanding and explanation rather than an end in itself. Confronting such thorny matters needs to be embedded in our research practices and supported by greater openness, more and better substantiation of our conceptual, theoretical and empirical claims, enhanced critical reflection, and deeper engagement with politics, policy and praxis.

1. Introduction

Concerns have been articulated in economic geography for more rigour, transparency and dialogue about the relationships between theory, concepts, methods, politics and policy. As Barnes *et al.* (2007: 2) put it:

> economic geography has passed through a series of far-reaching cultural, institutional and relational 'turns', during which time its objects, subjects, and means of study have been repeatedly overhauled. But despite these tumultuous changes, questions of method – the how and why of research – have been only fitfully (re)considered.

Such anxieties reflect the feeling that "Many of the decisions we make about methods we seem to make 'in private', or we bury them deep in research funding proposals, footnotes, or dissertation appendices" and "sustained methodological reflection is rare" such that "economic geography is methodologically opaque" (Barnes *et al.* 2007: xiv, 21).

Such criticisms are particularly apposite for the burgeoning sub-field of evolutionary economic geography (EEG) where relatively rapid conceptual and theoretical development and a growing body of empirical studies have outstripped methodological debate. Indeed, evolution is identified as one of an emergent range of new theoretical influences opening up and leading economic geographers into new methodological directions and territories (Barnes *et al.* 2007, Scott 2000). Doing evolution in economic geography, then, is not immune to the wider soul searching about concepts, theory, methods, politics and policy in the sub-discipline. This much is recognised by its protagonists, echoing longstanding issues in economic geography (Massey and Meegan

1985, Markusen 1999, Yeung 2003) and broader social science (Hodgson and Knudsen 2010, Lawson 1997, Potts 2000, Sayer 2000). The call for more "methods talk" (Barnes *et al.* 2007: 24) is timely for EEG in taking stock of its achievements, blind spots and shortfalls, identifying ways of addressing its challenges, and discerning promising future research directions (Boschma and Frenken 2010, 2015; Boschma and Martin 2010, Coe 2010, Grabher 2009, Hassink *et al.* 2014, Martin and Sunley 2015).

The initial burst of evolutionary thinking in economic geography led to the emergence of multiple ideas – such as selection, lock-ins and path dependency – that have been taken up in different ways in conceptual, theoretical and empirical work. Early reflection upon their use has bemoaned a somewhat ad hoc, descriptive and sometimes loose and unclearly specified application of concepts, and their uncritical deployment as disconnected metaphors in attempts at explanation (Essletzbichler and Rigby 2007, Grabher 2009). This disquiet has led to calls for more tightly defined concepts (Essletzbichler 2009), and their operationalisation within more clearly specified, systematic and rigorous theoretical frameworks (Boschma and Martin 2007). The methodological and analytical tasks have been articulated as clarifying the conceptual apparatus, determining the scope of different theoretical frameworks, specifying the causal mechanisms, and disentangling varied evolutionary explanations to assess their contributions and limitations (Grabher 2009).

Here, we seek to contribute and move beyond the growing but not entirely settled consensus that EEG should employ plural methodologies better to engage and explain heterogeneity, variety and change in the economic landscape (Boschma and Frenken 2007, 2010, Coe 2010, Grabher 2009). Specifically, our aims are to identify some of the difficult issues facing those doing evolution in economic geography and to articulate the

valuable contributions that one particular theoretical framework – geographical political economy (GPE) – can provide in framing and addressing these (see, for example MacKinnon *et al.* 2009, Oosterlynck 2012, Perrons 2004, Sheppard 2011). The paper argues that GPE provides a holistic, contextual and integrated framework that can connect spatial economic evolution to broader questions of value creation and capture, institutional variegation, and combined and uneven development (MacKinnon *et al.* 2009). Furthermore, compared to other natural science-derived frameworks adopted within EEG such as Generalised Darwinism, complexity theory and developmental biology (see Essletzbichler and Rigby 2007; Martin and Sunley 2007, 2015), the pluralist version of GPE that we favour offers a critical social science perspective that is deeply attentive to issues of agency, context and institutionalisation that have been recognised as under-developed in EEG (Boschma 2015; Martin and Sunley 2014). This approach is presented as something of a provocation from outside what has been interpreted as the core of EEG (Coe 2010) – defined as the "primary key approaches and theoretical foundations" of Generalised Darwinism, complexity theory and path dependency (Kogler 2015: 706). The contribution is designed to broaden and further methodological understanding and reflexivity in the field with the goal of contributing towards increased pluralism, dialogue and debate between different perspectives. In so doing, our aim is to distinguish and elaborate one particular way of doing evolution in economic geography rather than trying to privilege GPE as the "main alternative" or "most convincing" perspective in EEG (cf. Hassink *et al.* 2014, Martin 2012a).

To begin, we briefly define GPE and situate the particular version advanced here in political-economic and evolutionary thinking. The rest of the paper identifies substantive methodological concerns troubling evolutionary research in economic geography, and elaborates distinctive ways of addressing them and illustrative concrete examples from

our GPE perspective. First, we examine the specification and connection of research objects, subjects and levels and highlight what a more integrated and critically reflexive GPE framework can contribute by using a 'full circuit' of capital method and distended case analysis of co-evolutionary processes. Second, we argue that the contingency and particularity generated by agency and context can be handled through the techniques of 'following the path' and 'deep contextualisation'. Third, our approach to the difficult question of engaging and integrating qualitative and quantitative methods in EEG emphasises the need for critical reflection, openness, dialogue, mutual learning and commitment to multiple methods and experimentation. Fourth, we address questions of comparison by engaging with relational perspectives and 'incorporated comparison' (McMichael 1990. Last, we demonstrate the relevance, contribution and importance of evolutionary approaches for politics, policy and praxis. Rather than erasing underlying differences in ontology, epistemology, theory, methods and politics, we conclude that there is value in bringing different perspectives into conversation to draw out fresh insights, ideas and methods from their collision. In so doing, methodological pluralism represents a means toward improved understanding and explanation rather than an end in itself.

2. Geographical political economies and evolution

Drawing upon diverse theoretical strands, there exists a longstanding tradition of infusing political-economic frameworks with greater sensitivity to geographical concerns (Harvey 1982, Jones 2008, Scott 2000). While initially situated in Marxist thinking, the radical geography approach has since diversified remarkably into a "pantheon of geographical political economy" (Sheppard 2011: 320), shaped by currents from feminism,

institutionalism, post-modernism, post-structuralism and post-colonialism, and stimulated by critiques of the economism, reductionism and structuralism of (neo-) Marxian variants. As Jones (2015) argues, rather than having been eclipsed by the growth of these post-prefix perspectives, GPE remains influential in a number of areas of contemporary economic geography. This is evident in, for instance, work on cultural political economies (Jessop and Oosterlynck 2008, Jones 2008), global production networks (Yeung and Coe 2015), probabilistic analysis (Plummer and Dezzani 2012) and environmental economic geography (Castree 2010), in addition to debates about the direction of EEG (Hassink et al. 2014; MacKinnon *et al.* 2009).

As a theoretical framework rooted in multiple strands of thought, GPE is pluralistic and includes various approaches (Hassink *et al.* 2014). As Martin and Sunley (2015: 26) note:

> there is no single unified, integrated or generally agreed form of geographical political economy…different economic geographers would…subscribe to somewhat different versions of…'geographical political economy', and would not necessarily view the approach as synonymous with Marxist political economy.

But this does not mean such geographical political economies lack definition and are unclear (cf. Hodgson 2009). Nor are they so broadly framed that they lose purchase as conceptual and theoretical frameworks or can be misunderstood as catch-all 'anything but neo-classical economics'-type approaches. The particular kind of GPE that underpins the approach to evolution and the methodological excursions here has the following characteristics. First, it conceives of capitalism as one particular form of social, economic and political organisation, and interprets its geographies as emerging from the co-evolution of economic, social, political, cultural and biophysical relations and processes

(Castree 2010). Denying the separation of the economic from other influences gives this GPE its comprehensive, holistic and integrated attributes and reach (Perrons 2004). Conceptualising and theorising the compelling and systematic rationales in capitalism – capital accumulation, competition and innovation, instability and conflict (Harvey 2006) – shapes its evolution over time and space. Such conceptions direct critical research attention towards inherently geographical political-economic questions including value, social and spatial relations, power and state formation *as well as* 'new' political economic concerns in social and cultural construction, discourse and the embedding of economic actors and agency (Goodwin 2004, Jessop and Oosterlynck 2008, Jones 2008, MacKinnon *et al.* 2009, Pike *et al.* 2009).

Second, sensitive to critiques of economism, reductionism and structuralism, the GPE conceived here views the economy as constituted by socio-spatial relations rather than atomised and free-floating actors in time and space, and emphasises the mutually constitutive and recursive relationships between agents and structures (Harvey 2006). Social agency is interpreted as widening the "empirical margins of what can happen within a given 'structural' constraint", while path dependent institutional evolution implies cumulative causation as "innovations generated by agents can have long-lasting effects on 'structures'" (Storper 1997: 30). Informed by critical realism, the geographical political-economic approach advanced here copes with context, diversity and variety by recognising that causal powers inherent in structures can be realised only contingently in particular time-space contexts (Hudson 2006). Last, this *geographical* political economy interprets capitalism as generative of combined and uneven development and socio-spatial inequality (Harvey 1990). Space is actually produced through the process of economic and social development rather than operating as a pre-given external constraint (Smith 1990). But the geographies of capitalism are understood as contingent and

emergent rather than simply determined by the rationales of capitalist accumulation, and unfold in the economic landscape in and across territorial scales and relational networks (MacKinnon 2011).

Rather than attempting to provide some kind of grand synthesis of GPE and evolutionary thinking, the version of GPE articulated here is a theoretical perspective designed to illuminate recurring methodological issues in EEG. At the same time, our GPE framework is enhanced and extended by its connection to key strands of evolutionary thinking. In common with the diversity and pluralism of political economy, "evolutionary economics…is a house with many rooms" (Klaes 2004: 371). While certain strands of evolutionary thinking have been developed in opposition to more deterministic and 'developmental' versions of Marxism (see Hodgson 1993), the 'open' form of GPE adopted here views the evolution of capitalist economies over space as an open-ended process with no defined end point (Hudson 2006). Indeed, evolutionary ideas help to challenge any remnants of determinism in geographical political-economic reasoning and open it up to diversity and variety in the economic landscape (Hudson 2006), including evolving forms of institutional variegation (Peck and Theodore 2007), informed by the closely inter-twined nature of evolutionary and institutional thought in heterodox economics (Hodgson 2009). Conversely, the influence of GPE relates evolutionary processes to the broader, systemic rationales and dynamics that are reshaping the geographies of contemporary capitalism (MacKinnon *et al.* 2009).

Echoing the historical materialism of (neo-) Marxist variants, our evolutionary-oriented conception of GPE emphasises the on-going transformation of an array of geographical economies related and territorialised in cities, localities and regions and their institutional configurations (Baeten *et al.* 1999). Evolutionary concepts and their emphasis on the

inter-relations of formal and informal institutions help to deepen and nuance understanding and explanation. In creative combination with geographical political-economic categories such as crisis, technological change and state power, concepts of the creation, dependency and plasticity of paths and lock-ins have focused explanation on the agency of actors and their struggles to (re)create and (re)cohere economic, social and political relations and institutional arrangements (Grabher 1993, Hassink and Shin 2005, Martin 2010, Strambach 2008, Oosterlynck 2012). Evolutionary ideas greatly enhance GPE by providing greater temporal and spatial sensitivity, and providing incisive concepts and theories to explain how the dependencies, endowments and legacies bequeathed by historical-geographical paths shape the on-going trajectories of capitalist development in recursive ways.

Elements of the conceptual richness and integrative value and potential of GPE have been acknowledged by Martin and Sunley (2015: 26) who suggest that "some of the core ideas that underpin GPE could certainly inform and enrich evolutionary economic geography, and provide a more systemic and holistic orientation to our analyses" (see also Goodwin 2004). In particular, the comprehensive and integrated nature of GPE provides the kind of holistic, robust and systematic understanding of causal relations, mechanisms and processes needed to prevent applications of evolutionary concepts in impromptu, disconnected and weakly inter-related ways. Bringing evolutionary concepts into critical dialogue with its conceptual categories and theoretical frameworks, this geographical political-economic approach encourages more analytical, rigorous and reflective rather than descriptive and metaphorical deployment of evolutionary ideas. This kind of evolutionary GPE analysis demonstrates the value of seeing theoretically-informed empirical work and empirically grounded theorizing as an interplay between

deductive and inductive inference which confronts and refines theory with and through empirics (Barnes *et al.* 2007, Sunley 2008).

Emergent critiques of GPE have persisted with somewhat stereotypical and thin characterisations that fail to recognise its plural and evolving nature. Concerns include, first, that it is too limited in its research focus, prioritising macro-level forces and structures (Martin 2012), and specifically the impacts of external investment on regional development and the unequal power relations between transnational and local actors (Hassink *et al.* 2014). And, second, that GPE remains overly deterministic, reductionist and narrow since it conceives of institutions solely as capital-labour relations and the state, power as exclusively about class conflict and capital-labour struggles, and geographies in scalar terms defined only by "the state, trade regimes, labour and class" (Hassink *et al.* 2014: 1301, see also Hodgson 2009).

In response, as outlined above, the pluralistic version of GPE adopted here is much broader in its analytical scope, and conceptually open and supple in its explanatory repertoire than implied by these rather dated criticisms. This, in part, reflects its engagement with related strands of thought, particularly the evolutionary and institutional insights identified above. Guarding against the determinism of economism, reductionism and structuralism, it seeks more comprehensive, holistic and systematic accounts of the co-evolution of economic, social, political, cultural and bio-physical relations and processes. Informed by a broad conception of social agency, sensitivity to different modes of power and appreciation of institutional variety and complexity, our pluralistic variety of GPE recognises the roles of a range of actors, including different types of firms, entrepreneurs, state agencies operating across different scales, households, collective bodies such as trade unions and non-government organisations (NGOs), and

voluntary and community groups, in shaping the evolution of the economic landscape. It also views geographies as simultaneously territorial, relational and scalar (Cumbers and MacKinnon 2011). This kind of geographical political-economic inquiry is more nuanced and subtle than any restrictive kind of structural determinism or reduction of empirical context, diversity and variety to the same one-dimensional, top-down and narrowly economic explanations irrespective of time, space and geographical setting. As we argue in the remainder of the paper, this framework provides a way of addressing difficult methodological issues in EEG.

3. Specifying and connecting research objects, subjects and levels

Critical questions have been asked in evolutionary research about exactly which actors and mechanisms are actually (doing the) evolving in the economic landscape, where, when and why (Martin 2010)? Studies to date have focused on different levels of analysis and research objects and subjects (Boschma and Frenken 2007). They include work at the micro-level on organisational routines within firms (Boschma and Frenken 2003, 2009, Stam 2007), meso-level studies of clusters, industries, labour markets, networks, sectors and technologies (Essletzbichler and Rigby 2004, Giuliani 2010, Hassink 2010, Neffke *et al.* 2011) and macro-level accounts of institutional contexts, political economies, spatial systems, technological shifts and trade cycles (Essletzbichler and Rigby 2004, Lambooy 2010, MacKinnon *et al.* 2009). This plurality of foci and research effort is a welcome characteristic of evolutionary studies. But few attempts have been made to try and connect such research objects, subjects and levels together into more comprehensive, holistic and integrated frameworks (Hassink *et al.* 2014, Martin and Sunley 2015).

GPE contributes by providing the kind of multi-actor and multi-scalar perspectives and methods to address the "multiple connections and interdependencies…[that]…are crucial if a comprehensive framework with which to explain economic evolution is to be achieved" (Hassink *et al.* 2014: 1299, see also Gertler 2010, Martin and Sunley 2014). First, such an approach encourages critical enquiry to interrogate the robustness and meaning of conceptual categories and their theoretical inter-relations (Goodwin 2004). This reflective stance focuses the work of conceptual and theoretical definition, clarity and distinction. And, second, it provides a holistic conceptual and theoretical framework for connecting the micro and macro levels of analysis in EEG and linking particular research objects and subjects to broader political-economic processes (Martin and Sunley 2015). This means that actors must always be situated within broader socio-spatial relations; for example firms in wider industrial networks, local and regional state agencies nested within multi-level governance systems, and places entwined in scalar structures and relational networks. It emphasises not only the influence of these broader structures and networks in conditioning and shaping micro-scale processes, but also the effects of these micro-level actions on the evolution of the broader entities with which they are entangled, contributing to their reproduction or ultimate transformation (see Lawson 1997). While offering a far-reaching, inclusive and inter-connected approach, it begs the methodological question of where to start given the impossibility of studying everything simultaneously.

One route in draws upon the GPE conception of the full spatial circuits of value and meaning in capitalism, comprising co-evolutionary processes in time and space of production, circulation, consumption and their regulation (Hudson 2005, Smith *et al.* 2002). Understood as inter-related parts of a connected and dynamic spatial circuit, each

process provides a potential entry point to render visible a wider array of actors and their socio-spatial relations than hitherto, and to begin the process of understanding such parts *and* their inter-relations within the whole circuit. How can such a research approach and method be undertaken? Reaching beyond the discrete, individual and isolated case study, the "distended case approach" seeks explanation in the interplay between trans-local relational connections and mutations, and "'local' socioinstitutional context" across networks and multiple sites (Peck and Theodore 2012: 24). Research method, design and analysis in evolutionary GPE can address the dynamic co-evolutionary processes integral to capitalism in a similarly distended fashion. Working 'through', 'within' and 'outward' from the process selected, this approach can uncover how it travels, unfolds and manifests over space, through time and across different geographical contexts.

The regulation of economic activities provides a concrete example of a co-evolutionary process in the full circuit of capital, encapsulating the reach and limits of state power through institutional actors attempting to shape the character and degree of competition, market dynamics and economic structure (Hudson 2006). For instance, large retail groups – such as supermarkets in the UK – have been subject to substantial research on the regulation of their market and spatial power in sourcing strategies, competition and pricing, and local planning and land banking (Bowman *et al.* 2012, Coe and Wrigley 2007). A distended case analysis in an evolutionary GPE frame would involve the following tasks. First, identifying the regulatory actors involved, mapping their scalar jurisdictions and explaining their regulatory strategies and powers, including national government departments, competition authorities, and local and regional planning bodies. Second, working through these regulatory institutions to establish the actors subject to regulation, particularly the large retail groups, and understand how they interpret, address and seek to influence regulatory processes. Third, reaching wider to

map and examine the socio-spatial relations with other actors and explaining their attempts to shape regulation including consumer and pressure groups, labour unions, lobbying organisations, producer bodies and trade associations. Fourth, extensive historical investigation to uncover the recent evolution of the industry in question, particularly how key actors and subjects of regulation have adapted to regulatory change and the extent to which this has been shaped by inherited and on-going commitments and legacies.

This full circuit approach and distended research method demonstrates the holistic and systematic attributes of GPE categories in clearly specifying and connecting research objects, subjects and levels, situating actors in their wider socio-spatial relations and circuits, and assessing the influence of historical-geographical paths and legacies in the evolution of research objects. It also requires an involved and lengthy research process capable of encompassing multiple actors, relations and geographies, and situating explanation within evolving and inter-related multi-level political-economic contexts.

4. Handling agency and context

Enduring questions remain about how to address the contingency and particularity imparted upon evolution in the economic landscape through agency and context (Barnes *et al.* 2007, Martin and Sunley 2014). The ability to explain diversity, emergence, heterogeneity, variety and their reproduction are strengths of evolutionary approaches. But an over-emphasis on the documentation and interpretation of complexity, context and difference can foster an inductive empiricism that frustrates attempts to develop wider frameworks of understanding capable of analysing and comparing evolution across

different geographical settings (Martin and Sunley 2015). Informed by the critical realist emphasis upon causal relations and powers contingently realised across time and space (see, for example, Hudson 2006, MacKinnon *et al.* 2009, Sayer 2000), a way forward is through focusing upon evolutionary paths which are central to existing EEG work. Here, a path is comprised of a temporal sequence of inter-related events in which future outcomes are shaped by past decisions, reflecting the on-going causal relations between human agency and social and technological structures (David 2001; Lawson 1997; Martin 2010). The path concept has been applied to two main sets of research objects in EEG; industries, sectors and clusters; and local, regional and urban economies (see, for example, Simmie and Martin 2010, Martin 2010; Schamp 2005). Less attention has been devoted to institutions thus far (Boschma 2015). Advances have been made to avoid historical determinacy, acknowledge the influence of geographical contexts, recognise openness and contingency (Martin 2010) and, in 'path as process' (Martin and Sunley 2006), grasp how social agency both shapes and is shaped by such trajectories. Our pluralist version of GPE helps to advance evolutionary thinking by explaining *how* and *why* specific paths unfold in particular ways over time and space, emphasising the role of multiple actors in socio-spatial structures, capital accumulation, institutional configurations, and combined and uneven geographical development.

Inspired by the 'following' methods in commodities (Cook *et al.* 2006) and policy mobilities (Peck and Theodore 2012) research, a novel analogue for this evolutionary GPE is to 'follow the path'. This method involves several key tasks. First, is the identification of the path in question. In concrete empirical terms, this comprises selection of a specific economic activity such as raw material mining, clothing manufacture or software design and/or a particular geographical economy such as a locality or city-region. These research objects provide the entry point for specifying the

actors beyond just firms and their socio-spatial relations involved in shaping the path such as the state and quasi-state institutions, labour unions and civic organisations. While paths can often be identified more clearly in retrospect by uncovering the historical evolution of an established industry or cluster through following the path 'backwards', it is also possible to follow emerging paths 'forwards'. For examining future aspirations, the aims, strategies and plans of local, regional and urban development institutions are a key source (see Dawley *et al.* 2015).

The second task is the mapping of the material manifestations of the path. This involves tracing over time and space the substance and geographies of the path in quantitative and qualitative terms. Quantitative analysis tracks economic indicators such as output, employment and productivity for the selected economic activities and/or places. Qualitative analysis assesses the type and nature of output growth, the quality of jobs and character of productivity change.

The third element entails capturing the discursive and symbolic representations of the path by the actors involved. Recognising how narrative and linguistic constructions bring about material effects, Jessop and Sum's (2001) concept of 'economic imaginaries' illuminates the discursive and rhetorical devices deployed by actors seeking to frame, narrate and shape economic action and behaviours in current and future path trajectories. Critical discourse analysis provides the technique of interrogating key texts produced by actors drawn from appropriate historical time periods and geographies (e.g. investment prospectuses, primary and secondary interview transcripts, news cuttings, press releases, and speeches).

Fourth, the findings of following the path can be integrated through a comprehensive and holistic analysis to provide an evolutionary and geographical political-economic explanation of the path's unfolding over time and space. Multiple studies of paths followed can be drawn together into categorisations of path types, forms and patterns to enable wider comparison and interpretation across paths in space and time.

Another fruitful method for the evolutionary GPE here in handling agency and context lies in "deep contextualisation" to:

> consider the full set of entities, factors and influences, including internal (endogenous) and external (exogenous), local and non-local, and structural and contingent, that have conditioned and shaped the evolutionary dynamics and trajectory of the spatial economic developmental system under study (Martin and Sunley 2015: 721).

'Deep contextualisation' involves several connected elements. In an empirical study of efforts to create an offshore wind energy path in North East England and Scotland (Dawley 2014, Dawley *et al.* 2015), the first step comprised historical investigation of the antecedents of the 'pre-formation period' (see Martin 2010) to trace the tracks and routes identified, selected and explored by actors prior to the emergence of more developed paths. A broad empirical reach is required to uncover the full set of actors involved, their internal and external relations and networks within and beyond North East England and Scotland, and the range of factors and influences explaining their evolving agency and contexts.

Second, inspired by the methods of "being there" (Gertler 2004: x) and "global ethnography" (Burawoy 2001: 147), a 'deep cover' approach was taken to enable immersion in the path amongst its myriad actors including firms, industry associations, technology intermediaries and government agencies and departments. Contact networks were built, interviews conducted, secondary sources collated and non-/participant observation undertaken over a sustained period – currently 5 years. Sources were revisited several times in longitudinal and distended case fashion. The aim was to get at the buried, deep-seated *as well as* wider relations, positions and contexts of actors inter-related in structures unfolding over space and time (see, for example, Saxenian 1996).

Third, periodisations of the emergent paths were constructed, including the dead-ends of abandoned paths, using a range of data (e.g. output and employment at lead firms) and annotated with key events (e.g. inward investments, government policy changes). Analysis of the findings of such 'deep contextualisation' methods prioritised identifying the key actors and their socio-spatial relations alongside the mechanisms and processes at work in shaping how the paths were created (and destroyed) as well as how such trajectories patterned the agency of actors and the unfolding of the paths. Openness to downward (top-down), upward (bottom-up) and outward (horizontal, relational) causation was critical to explain the interactions between actors and across levels (in this case firm, institution, region, nation-sate and industry) (Martin 2012).

5. Engaging and integrating the qualitative and the quantitative

A dualism is evident in evolutionary research between qualitative and quantitative work (Boschma and Frenken 2007, Coe 2010). Finding ways to bring together quantitative and

qualitative ontologies, methodologies and analyses is a longstanding concern across the social sciences (Bryman 2006, Brannen 1992) and in economic geography (Clark 1998, Plummer 2007). It intersects issues of data availability and quality at specific scales and, particularly given the focus on evolution over time and space, appropriate periods to enable dynamic historical and longitudinal analysis (Boschma and Frenken 2007, Rigby 2007).

Articulating quantitative and qualitative research is an especially acute problem for evolutionary approaches in economic geography given their particular history of intellectual development. A pioneering strand has followed a quantitative track (see, for example, Boschma and Frenken 2010, Essletzbichler and Rigby 2007, Plummer and Tonts 2013). These studies have built solid foundations for evolutionary work: tightly defining conceptual categories; specifying and theorising their relationships; articulating and testing formal hypotheses; developing robust methods, research designs and data sources; and, measuring and mapping the incidence of associations, patterns and regularities of evolutionary change across space and time. Acknowledged by its advocates, such work has struggled with: identifying appropriate proxy indicators for fuzzier but important concepts (e.g. formal and informal institutions); inter-relating its different levels of analysis; contextualising its studies in their economic, social, political and institutional settings; securing required levels of availability and comparability of data across space and especially time for historical and longitudinal analyses; establishing the extent and nature of causation amidst association and correlation; and, drawing out its implications for policy.

Another strand of evolutionary research has been more qualitatively focused (see, for example, Dawley *et al.*, 2015; Hassink and Shin 2005, Simmie and Martin 2010, Sydow *et*

al. 2010). It has theorised with looser and less tightly defined concepts, undertaken comparative analysis between different geographical settings, provided rich empirical studies capturing the diversity, variety and heterogeneity of evolutionary change, and sought to identify explanatory causal relations, mechanisms and processes. Largely accepted by those involved, these studies have been weaker on translating qualitative data into consistent categories to enable systematic comparison and analysis across time and space, rigorously interrogating empirical findings beyond compare and contrast frameworks, developing a cumulative, robust and credible body of knowledge, and engaging with public policy.

Concrete ways forward to not only utilise but integrate qualitative and quantitative methods are evident in GPE-oriented work in EEG. Using qualitative insight from a detailed literature review to frame their primarily quantitative empirical analysis, Rigby and Essletzbichler (2006) demonstrate how accumulation and competition dynamics in capitalism fuel technological innovation and variety. Imitation and selection narrow it down to competitive and efficient versions with technological differences persisting because of geographical differentiation in relative prices, localised knowledge spill-overs and institutions. Plummer and Sheppard (2007) have extended and adapted the mathematical and statistical tools of econometric testing to interpret the self-destabilizing nature of spatio-temporal dynamics in capitalist economies.

Looking outwards from evolutionary work in economic geography (Peck 2012), other disciplines further demonstrate the explanatory power of integrating qualitative and quantitative methods. In institutional and socio-economics, Finch and McMaster (2002) demonstrate how observed patterns in quantitative data, correlations or 'demi-regularities' (Lawson 1997) can be captured by specific (non-parametric) statistical

procedures, contributing different kinds of knowledge at different phases of developing causal explanation and building in corroboration and triangulation. In critical accounting, Froud *et al.* (2006: 122) elaborate a "narrative and numbers" method, integrating quantitative analyses of indicators with qualitative interpretation of their discursive interpretation and articulation by actors.

The holistic and integrative aims of GPE in doing evolution in economic geography offer concrete ways to advance appropriate use of multiple methods through new and "innovative research collaborations and partnerships" (Coe 2010: 7), bringing quantitative and qualitative approaches and researchers together to learn from each other in joint research. Recognition and openness to such endeavour is beginning. In their quantitative analysis of industrial branching and technological relatedness, Neffke *et al.* (2011: 260) explicitly recognise that:

> a visual analysis of industry space can help localize likely hot spots of inter-industry interaction in the structural transformation of a region that merit closer scrutiny by qualitative research methods…knowledge of which industries are strongly linked to the protagonists of structural change in a specific region can help sharpen the focus and delimit the scope of a case study design.

Plummer and Tonts (2013: 239) too raise the "possibility of a rapprochement between quantitative methodologies, local models, and situated knowledges" in addressing local context and contingencies. Boschma and Capone (2014) have sought to integrate the neglected role of institutions in determining the direction of industrial diversification through incorporating critical engagement with the 'varieties of capitalism' literature into their quantitative analysis of trade data.

Building upon these promising beginnings, further practical steps enabling dialogue, interaction, cross fertilisation and integration are ripe for exploration. Systematic review of qualitative studies can help distil taxonomies and general propositions to inform hypothesis building for formal quantitative treatment. Backward extension of available quantitative data and its integration with historical qualitative analysis of secondary sources and in-depth engagement with relevant actors from the past and present can assist following the path methods (Section 4). Aggregate data analyses can map and measure the incidence of evolutionary phenomena, shaping the empirical focus of in-depth comparative, extended and distended studies of "critical cases that are capable of generating new theoretical insights, rather than merely illustrating extant theory claims" (Barnes *et al.* 2007: 10-11).

At the same time, overcoming longstanding aversions and scepticism to quantitative theorisation and analysis in some versions of GPE remains challenging (Sheppard 2011). As Coe (2010: 7) notes, the "ontological and epistemological differences between the (quantitative) core of EEG [Evolutionary Economic geography] and other (qualitative) parts of economic geography are still considerable" and any "methodological rapprochement will be easier said than achieved". While careful synthesis of quantitative and qualitative approaches is difficult (see, for example, Sayer 2000), the promise of deeper understanding and explanation, covering the gaps not addressed by the other to reveal a fuller picture, makes it worthwhile at least exploring in a more concerted manner (Essletzbichler 2009).

Three concrete things suggested have been made to encourage such dialogue (Sheppard 2011). First is the need to reflect and even reconsider established and longstanding

dispositions and preconceptions about concepts, theory and method. This means more openness and transparency, the active encouragement of scrutiny and critique, and the willingness to incorporate learning and adapt in its wake. Second is a call to recognise diversity in scholarship rather than dismissing or stereotyping alternative or competing approaches, resonating with the pluralist understanding of GPE advanced in this paper. Last is a plea to foster mixed methods approaches – from discourse, textual analysis and ethnography to surveys and statistical analysis – to benefit from complementary expertise and focus on common empirical concerns and the creation of spaces for joint working and learning.

6. Comparing cases

As a youthful research field, evolutionary work in economic geography lacks comparative studies, and has generated a relatively narrow body of empirical work limited in its coverage and comparison of economic activities and/or geographical settings internationally (Grabher 2009). Comparison in evolutionary studies to date has been focused on specific research objects (mainly firms, industries and networks), and undertaken in particular spatial contexts (e.g. region, city-region) often within single or two-country settings. This shortfall reflects worries in economic geography concerning the "apparent disinclination across the field to invest in corroboration, triangulation, and interrogation across comparative sites" (Barnes *et al.* 2007: 22, see also Gertler 2010, Peck and Theodore 2007). Strengthening comparison in evolutionary approaches is critical to ensure that empirical studies focusing upon geographical differentiation, diversity and heterogeneity in the economic landscape become "more comparable, transparent, and cumulative" (Boschma and Frenken 2009: 156). More comparison would enable

systematic cross-referencing over space and time to yield deeper insights and challenge the rigour and robustness of conceptual frameworks and theoretical explanations (Boschma and Frenken 2009, Grabher 2009). Yet this desire raises largely unanswered but fundamental questions about the rationales for comparison, the different kinds of comparison, the selection of appropriate kinds and numbers of comparator cases, the identification of themes upon which to base comparison, and how difference, similarity and equivalence are treated (Ward 2010).

Evolutionary GPE suggests concrete ways to undertake comparison aligned with relational approaches in urban political economy (Ward 2010). GPE is rooted in a conception of combined and uneven development that underlines the importance and worth of comparison in explaining the inter-relations between places, how wider processes unfold in particular places, how places feed into the operation of broader structures, and how the positions of places in spatial divisions of labour evolve over time (Massey 1995). 'Incorporated comparison' (McMichael 1990) provides an appropriate method for empirical research underpinned by such relational understandings. In concrete terms, incorporated comparison involves two key elements.

First is the specification of the composition and context of the units to be compared. In an evolutionary GPE, this can comprise a set of local economies formed through their relations with each other, involving: common economic activities or industries; direct flows of materials, knowledge and actors; similar positions within wider spatial divisions of labour; or shared exposure to particular forms of economic shock (Bristow *et al.* 2014; Massey 1995). Second is the selection of the kind of comparison across space and time. Cross-*space* comparison identifies a specific conjuncture that combines "particular spatially-located parts of a global configuration" (McMichael 2000: 671). For example,

this might comprise the evolution of a global production network or commodity complex that connects different places in the international economy (Cook *et al.* 2006; Yeung and Coe 2015). Cross-*time* comparison identifies specific temporally (rather than spatially) differentiated examples of the unfolding of more general processes, such as competition, crisis and recovery, at different points in time and space.

In an evolutionary GPE frame, incorporated comparison enables analysis of the ways in which places – cities, localities, regions – are actively produced through their inter-relations with each other *and* their interactions with wider historical-geographical processes. Comparison focuses upon selected spatial units similarly positioned within wider socio-spatial relations – such as global production networks, spatial divisions of labour and systems of political governance – to explain how the dynamics of capitalism channelled and mediated through these relations and networks unfold over time and space.

Incorporated comparison also affords practical methods to grasp the institutional variegations across space and time that in evolutionary GPE are integral in providing the economic and extra-economic support to enable and sustain capital accumulation (Oosterlynck 2012). Research focuses upon how such variegations of capitalism at the national as well as local, regional and urban scales emerge and operate within wider evolutionary processes of state regulation (Peck and Theodore 2007, Crouch *et al.* 2009). Empirical work aims to map, uncover and compare the state and its multi-actor and multi-scalar relations and contexts between geographical settings, spanning public, private, civic and hybrid actors, and their territorial jurisdictions and relational networks. Utilising 'deep contextualisation' (Section 4), the mixed methods involve piecing together 'institutional genealogies' that capture and enable comparison of the unfolding over time

and space of the deep-seated and particular *as well as* the wider relations, positions and contexts that are co-constitutive of the particular institutional configurations at work. Selection of the key institutions is critical, including national government departments, regional development agencies and city-regional authorities. Tasks involve engaging with archives, tracing historical documents, rooting around in press libraries, and undertaking rigorous oral histories with retired individuals to gather quantitative (e.g. evaluations, reports and accounts) and qualitative (e.g. press reports, semi-structured in-depth interviews with key actors past and present) data. The common analytical framework and themes identified through this research process provide the basis for the 'incorporated comparison' of institutional variegations through time and across space (McMichael 1990, Painter and Goodwin 1995).

Another focus of 'incorporated comparison' concerns the dynamic rationales of accumulation under capitalism and its attendant processes such as competition and innovation. Such processes are conceptualised as sharing certain characteristics while varying in their expression and unfolding over time and space. Actors in different geographical contexts and relational networks are highly inter-dependent and compelled by similar pressures to innovate and compete in market settings with high levels of uncertainty and unevenly spatially distributed information (Rigby and Essletzbichler 2006). But "different capitalists are unequally positioned in this spatial competition, in terms of location, economic and political power, strategic acumen, ruthlessness and know-how" (Sheppard 2011: 325). Evolutionary research deepens these geographical political-economic insights by demonstrating how the strategies of particular agents inter-relate closely and co-evolve, creating new socio-spatial structures that feedback and shape their future decisions and behaviours in recursive ways (Boschma and Martin 2007).

Focusing on a set of economic activities in goods and/or services, a distinctive method can take competition as its entry point to investigate and compare how the different actors in their different geographical settings are responding to the underlying process of competition within the same market context. Competition and market are held constant while the focus of explanation – the social relations and evolution of agency and the influence of their spatial situation – is allowed to vary. Geographical political-economic concepts sensitive to evolutionary ideas are then used to analyse and compare – for example the persistence of particular market structures or the legacies of historic rivalries – while recognising the co-evolution over time and space of socio-spatial relations and processes in geographically uneven development.

7. Considering politics, policy and praxis

Few attempts have been made to consider how (if at all) evolutionary approaches in economic geography relate to and can meaningfully influence politics, policy and praxis (see, for example, Asheim *et al.* 2011, Boschma 2005, Hassink and Klaerding 2011, MacKinnon *et al.* 2009, Pike *et al.* 2010). Researchers doing evolutionary work have largely ignored the struggle to deliver evidence and advice that connects with the different needs, perspectives and rhythms of activists, politicians and policymakers. This neglect may be informed by Boschma and Frenken's (2007: 16) view that the "policy implications of evolutionary economics are inherently difficult to derive" because it is difficult to draw general contemporary conclusions from the historical nature of evolutionary analysis, which "often shows the limited potential of policy makers to truly influence long-term geographical patterns of economic growth", while "success"

(however defined) can appear "unique and difficult to copy". Yet any potential relevance of evolutionary research has yet to be examined in a sustained way especially in the wake of the post-2008 global financial crisis and economic downturn and its ramifications for critical spatial theory (Hadjimichalis and Hudson 2014). As Massey and Meegan (2007: xii) remind us:

> Being clear about method, still more actually *debating* method, continues to be important…from being more exacting about our own rigour, to forcing us to address the question of what is our political purpose within this field of 'economic geography' (emphasis in original).

While often difficult and uncertain, engagement with policy, politics and praxis can provide beneficial confrontation with our conceptual, theoretical and methodological beliefs, commitments and routines as well as our analyses, explanations and prescriptions.

Grounded in traditions of critical enquiry, normative and political commitments and praxis (Goodwin 2004), GPE in an evolutionary register suggests certain ways forward and methods of engagement. Evolutionary research addressing issues of adaptation, adaptability and resilience provides a work in progress. Studies have focused on how places cope with disruptive economic change – including financial crises, recessions and technological shifts – to explain why some demonstrate the capacity to adapt and bounce back or remain unaffected while others become weaker and more vulnerable (Martin 2012b). Evolutionary GPE insights have shaped research engagement with policymakers in this area (see, for example, Bristow *et al.* 2014, Plummer and Tonts 2013). Informed by

these studies and our own research experience, we argue that such involvement can be fostered in the following ways.

First is the task of specifying research objects, subjects and levels: *who* and/or *what* is undergoing adaptation to *what*?, *who* or *what* is demonstrating adaptability to *what*? and the resilience of *who* and *what* to *what*? (Martin 2012b, Pike *et al.* 2010). Such questions have been used to help frame the policy issues and potential responses and to pose distributional and normative questions about resilience for whom and for what purpose (see, for example, Pike *et al.* 2013, MacKinnon and Derickson 2013).

Second, building upon the path-focused conceptions, research designs and methods explained above (Section 4), the conception of the unfolding adaptive paths of local and regional economies can be used to question their status as processions of pre-determined events about which local, regional or national actors can do little. Instead, the evolving paths are conceived as opening up 'moments' for engagement and intervention where conscious and deliberative agency by participant actors and institutions can influence and even shape the quantitative extent and qualitative nature of the emergent paths and their trajectories (see, for example, Pike 2005).

Third, different types of path should be distinguished (e.g. neutral or static, denuded or enhanced), alongside an assessment of their underlying adaptation (i.e. high levels of overlap and stronger relatedness with existing economic activities) or adaptability (i.e. lower levels of overlap and weaker relatedness with existing activities) (Pike *et* al. 2010; see also Grabher and Stark 1997). These understandings are then used to configure critical debate and reflection about the implications for policymakers of various strategies such as modernisation and renewal of existing activities or 'mindful deviation' (Garud

and Karnøe 2001) from historic economic specialisations through 'path branching' into related activities (see also Hassink and Shin 2005; Neffke *et al.* 2011). Last, different forms of communication and dissemination are pursued to effect policy engagement, including articles in academic (e.g. Pike *et al.* 2010) and more practitioner-oriented journals (e.g. Dawley *et* al. 2010a), research reports, briefing notes, seminars and workshops for policymakers in the UK and beyond (e.g. Dawley *et al.* 2010b). Understanding and explanation are enriched by such policy engagement because it prompts scrutiny, deliberation and reflection upon research aims, methods, and evidence as well as concepts, theories and knowledge claims in evolutionary GPE.

8. Conclusions

We have sought to respond to the wider concerns in economic geography about rigour, transparency and dialogue concerning the relationships between theory, concepts, method, politics and policy (Barnes *et al.* 2007). Focusing on the flourishing terrain of evolutionary approaches where such anxieties are felt acutely, we aimed to travel beyond the growing but unsettled consensus supporting plural methodologies. Our purposes were to outline a plural version of GPE as a distinct theoretical perspective for EEG, and to explain and demonstrate its worth in addressing some of the difficulties of doing evolution in economic geography.

Amidst a diversity of perspectives, the distinctive GPE framework advocated here conceives of capitalism as a particular form of social, economic and political organisation, founded upon actors recursively embedded in socio-spatial relations and structures, which is generative of combined and uneven geographical development.

Together with evolutionary ideas, this GPE emphasises the co-evolution of economic, social, political, cultural, and bio-physical relations and processes, periodisation of historical-geographical change and its institutional configurations, and the enduring influence of existing legacies and paths in shaping future trajectories.

The value this evolutionary GPE approach provides incorporates, first, the clearer and tighter specification of research objects, subjects and levels through a more holistic and integrated 'full circuit' of capital method, alongside a heightened recognition and grasp of 'co-evolutionary' processes through distended case analysis. Second, capturing agency and context through 'following the path' and 'deep contextualisation' of both internal and external socio-spatial relations, mechanisms and processes. Third, engaging and integrating the qualitative and the quantitative through critical rumination, openness, conversation, reciprocal learning and commitment to mixed methods and trial and error to provide deeper and fuller explanatory insight. Fourth, comparing and explaining change across space and time by using relational understandings and 'incorporated comparisons' of the political-economic and institutional variegations and evolutionary dynamics of capitalism in different spatial contexts. Last, considering the worth of evolutionary GPE approaches for politics, policy and praxis and the beneficial provocation such engagement presents for our conceptual, theoretical and methodological beliefs, presumptions and habits as well as our understandings, interpretations and explanations.

This paper should not be seen as an attempt to establish any kind of stable consensus or singular and dominant view of how to do evolution in economic geography. It does not represent a naively optimistic call to shirk principled and substantive differences in ontology, epistemology, theory, methods and politics. Instead, it aims to foster the kind

of "productive pluralism" envisaged by Grabher (2009: 125) "that is more than the simple coexistence of diverse strands that mutually ignore each other" and "requires debates about boundaries and relations of complementarity or incompatibility" (cf. Barnes and Sheppard 2010: 193; see also Hassink *et al.* 2014). We see particular worth in the dynamics and frictions of bringing different views into dialogue and disagreement, articulating and thrashing out commonalities and differences in ideas, approaches and methods by colliding distinct perspectives rather than leaving them to proceed down separate tracks. In this way, methodological pluralism is a means towards improved understanding and explanation rather than an end in itself. The different evolutionary approaches in economic geography might then be considered as complementary, mutually enriching and overlapping rather than competing and alternative perspectives. The relative lack of such methodological discussion and joint research to date reflects the limited reflexivity in EEG as groups of researchers immersed in the distinct research practices of quantitative analysis and qualitative case study work have largely tended to talk past one another.

We conclude that travelling with the following aspects constantly in mind on an on-going basis can help us move forward. First, providing heightened transparency to enable scrutiny of our combinations of research methods, designs, data, techniques and analytical frameworks is vital to encourage debate on how we attempt to get at the objects, subjects, relations and processes at work in the evolving economic landscape. Second, countering the feeling in economic geography that "arguments are rarely interrogated in depth before the field moves on" (Barnes *et al.* 2007: 23), a renewed commitment is needed to the continual challenges of corroboration, evidence and rigour in research. Third, enhanced critical reflection upon our analytical practices and what our findings mean and explain can increase the robustness of our emergent and developing

concepts and theoretical frameworks. Last, greater engagement with questions of politics, policy and praxis sharpens our research practice and creates the potential to make our work relevant and further reaching. We argue that such endeavour will help us to develop more methodological reflexivity in EEG, informing and enhancing our research practices as we confront the difficult and recurrent issues of doing evolution in economic geography.

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