

Making history matter more in evolutionary economic geography

Ron Martin and Peter Sunley

ACCEPTED VERSION

ZFW- Advances in Economic Geography

June 2022

Time is stitched into this landscape – any landscape – but time as measured by many different kinds of clock (Anna Pavord, 2016, 206).

Personally, I believe that there is an incessant give and take between historical and theoretical analysis and that, though for the investigation of individual questions it may be necessary to sail for a time on one tack only, yet on principle the two should never lose sight of each other (Joseph Schumpeter, 1949, 75).

Always history is being made: opinions, attitudes and institutions change, and there is evolution in the nature of capitalism (Frank Knight, 1935, 184)

1. Introduction: Evolutionary Economic Geography as Historical Social Science

It is now two decades since economic geographers began to explore and apply ideas from evolutionary thinking to conceptualize and explain the spatial development and organization of capitalist economies. According to its adherents, evolutionary economic geography is distinctive in the primacy it seeks to give to the forces that determine the *nature, pace and direction of change in economic landscapes over time*. To pursue that endeavour, evolutionary economic geographers have drawn on a range of evolutionary ideas, including evolutionary economics (and its use of the Generalised Darwinian triad of variety, selection and retention), historical economics (path dependence), institutional economics (institutional contexts), and complex adaptive systems theory ('economic complexity', adaptability and resilience). In their original formulations, most of those ideas ignore or neglect geography. Thus a key task in evolutionary economic geography has been to demonstrate how these ideas can help throw light on how geographical configurations of economic activity, materiality and performance emerge and change over time, and to highlight a range of processes and mechanisms that are 'evolutionary' in nature, and different from and additional to those emphasised by other approaches used in economic geography.

Unquestionably, a sizeable body of interesting literature has been built up around these aims over this relatively short period (see, for example, Schamp,

2002 ; Boschma and Frenken, 2007, 2011; Boschma and Martin, 2010; Hassink et al, 2014; Kogler, 2015; Martin and Sunley, 2015; Pike et al, 2016; Schamp, 2017; Martin and Sunley, 2021; Henning, 2022).¹ Both the range of evolutionary economic geography concepts, and their empirical applications, have expanded significantly. In certain respects, it might even be claimed that as a research paradigm, evolutionary economic geography has 'come of age'. However, the development of this paradigm has not been unproblematic, and several unsettled issues and questions remain, some of a fundamental nature. Indeed, an argument can be made that the time is ripe for some constructive critical self-reflection. In this respect, evolutionary economic geography is not alone. In recent years a major self-assessment has been unfolding in evolutionary economics, the main field from which evolutionary economic geographers have drawn inspiration. Debates have been ongoing in evolutionary economics over its lack of an agreed theoretical core; about its modes of evolutionary theorizing; its empirical remit; and how it should develop in the future (see, for example, Winter, 2014; Witt and Chai, 2018; Hodgson, 2019; Potts, 2021; Nelson, 2020).

Not dissimilar concerns can be levelled at evolutionary economic geography. There too, questions arise as to whether it has yet developed a coherent theoretical foundation, and what in fact that foundation should be; about its types of theorizing and explanation; about how it relates to other interpretative paradigms in economic geography; and about the narrowness to date of its empirical applications.² Further, for evolutionary economic geographers there is an additional issue with which evolutionary economists do not concern

¹ The literature that might be included under the heading of 'evolutionary economic geography' is now extensive, and cannot be surveyed in its entirety here; and that is not in any case our objective. The works just cited contain useful overviews and general surveys of the field and its development over the past twenty years.

² There is, in our opinion, a fundamental debate to be had in evolutionary economic geography as to precisely what is meant by an 'evolutionary' ontology. Is a commitment to the key tenets of Generalised Darwinism (variety, selection, retention) the only basis for an evolutionary economic geography? Does not using such ideas prevent a study from being 'evolutionary'? How does economic evolution differ from economic development? Even in biology there has been movement to integrate evolutionary (phylogenetic) and developmental (ontogenetic) processes. A parallel case can be made, for example, for integrating evolutionary economic geography and geographical political economy with its focus on the dynamics of uneven regional development under capitalism (see Martin and Sunley, 2015). Indeed, we would aver to predict that the construction of a 'geographical evolutionary political economy' could well become an endeavour of increasing interest.

themselves, namely the spatial dimensions of economic evolution.³ What are the key ‘units’ of spatial economic evolution? Is it firms, industries and technologies, and how these evolve across geographic space?⁴ Or should the focus be on the evolution of individual regions and cities in all their economic and institutional complexity? To date, evolutionary economic geography has focused more on the first question than on the second. At the same time, relatively little attention has been directed at the ‘mega’ trends, long-term processes, large structures and historic disruptions that drive and periodically characterise the evolution of capitalism and its geographies. And to add to these issues, evolutionary economic geography has been almost silent about the political context and determinants of economic change, and the normative dimensions of that change; in fact, almost deliberately apolitical.⁵

Our concern in this paper, however, is not with the disciplinary ‘positioning’ or integration of evolutionary economic geography with other approaches, nor with addressing the question of extending the empirical research agenda of the paradigm, nor, yet further, with its normative disposition (or lack thereof). Rather, our focus is on the equally important issue concerning the modes of theorizing and explanation used in evolutionary economic geography, and in particular on what to our mind is a somewhat curious feature, namely that although concerned with *evolution* – with processes of *historical* change and transformation – evolutionary economic geography seems not to take history as seriously as it would be expected to do (see also Lui, 2009; Henning, 2019). This reticence is doubly curious given that something of an ‘historical turn’ is underway across several social sciences, including sociology, political science, organisation science, and business and management studies, in all of which the value of history-informed research is being increasingly recognised.

³ It is intriguing, and not a little irritating, that in their assessments of the state of evolutionary economics and their promissory statements as to how it should develop in the future, its leading adherents, such as Winter (2014) and Nelson (2020), make no reference to the work that evolutionary economic geographers have produced over the past two decades or so. In this respect they seem to suffer from the same disciplinary myopia as economists in general.

⁴ Some commentators have argued, somewhat critically, that evolutionary economic geography is essentially yet another version of industrial geography (Coe, 2011).

⁵ The whole issue of axiology, the notions of value that underpin our work, what it is for, and for whom we do it, is hardly if ever discussed in evolutionary economic geography.

Why then should history matter more in evolutionary economic geography? The clue is in the very nature and aims of adopting an *evolutionary* perspective. The basic aim of any discipline or type of enquiry that calls itself 'evolutionary' is a concern to explicate how the entity or system under study changes, develops and transforms over time, that is with its *diachronic morphogenesis*. As the evolutionary economists Witt and Chai (2019) argue, "the unfolding of the economy is *an historical process*" (p. 5, emphasis added). Accordingly, our concern as evolutionary economic geographers should be in understanding how a given spatial configuration of economic activity and materiality at any given moment in time *has come to be what it is*, that is, how it was produced through time. As the urbanist Peter Hall put it some sixty years ago, "As is commonly the case with the geography of a complex economic unit, the present makes no sense until it is related to the evolutionary process which has produced it" (1962, p. 9). To that end, evolutionary economic geography is *inescapably an historical social science*.

But this then raises questions about how history should inform the construction of such explanations, indeed how it can help theory-building. Our aim in this paper is to explore these questions, and to suggest how and why history and historical causal investigation can enrich the theoretical and explanatory accounts constructed in evolutionary economic geography. Of course, other theoretical perspectives in economic geography can claim to take history into account as part of their explanatory endeavours. Geographical political economy, for example, is concerned with the historical dynamics of geographically uneven development under capitalism (Harvey, 2006). Regulationist perspectives emphasise the historical succession of different regimes of accumulation and their geographies (Bathelt, 1994; Peck, 2000). And relational economic geography gives prominence to path dependence, temporal context and contingency (see, for example, Bathelt and Glückler, 2003, 2017). We would certainly not claim that evolutionary economic geography should have a monopoly over explaining how economic landscapes change through historical time. But we do argue that it could and should have more to say about the historical dimension of such change, and ground its explanations more firmly in their historical contexts. To build this argument, we draw on ideas being developed in organisation science, management studies, social theory and political science, including Kipping and Üsdiken

(2014) concerning the different uses of history in theory development and testing, as well as the notions of 'temporalities' (Sewell, 2005, 2008), 'time-scapes' (Adam, 2008), and 'modes of 'historical causal investigation' (Ermakoff, 2019). We employ these different approaches and ideas to position how evolutionary economic geography utilises - and underutilises - history, and to identify some ways in which a more history-informed approach could be particularly fruitful. It is not our purpose in what follows to critique this or that individual paper in evolutionary economic geography: that is not our aim, nor would it be appropriate, for the subdiscipline currently comprises an extensive and stimulating literature. Rather, our underlying thesis is that considerable scope exists for strengthening the field by giving greater attention to history, and that this would encourage us to be more self-reflexive and pluralistic about the praxeology of our causal arguments in our studies of the evolution of economic landscapes.

2. Time, Temporalities and History-Informed Research

According to Henning (2018, p.1) "Like few other approaches, evolutionary economic geography recognises the importance of both time and history to a scientific understanding of regional development." We take this to mean that the aim and contribution of evolutionary economic geography is to explain the *actual unfolding through time* of the various features, structures and workings of real economic landscapes. A key implication follows directly from this objective: namely, that to understand how a specific spatial economic configuration has evolved requires *tracing the causal history of that evolution*. This calls for history-informed research strategies, and for historical causal investigation.

In their review of the historical turn in organization and business studies, Kipping and Üsdiken (2014; see also Üsdiken and Kieser, 2004; Kieser, 1994) distinguish between three different types of approach to history-informed research (Table 1), each of which has different strengths and weaknesses (see also Argyres et al, 2019). The first is termed '*history to theory*' and involves using historical and longitudinal data to test or modify existing theories and concepts, or to identify patterns and regularities in such data which provide evidential clues to help develop new theories. The primary focus is on the

application of appropriate methods to verify or assess empirically the relative role of selected theoretical causal relationships. The second perspective identified by Kipping and Üsdiken is *'history in theory'* and refers to those approaches where the use of the past is not simply as a source of data, but as an integral component part – a separate explanatory driver - of the theoretical schema or model itself. Examples would be theories and models that include institutional imprinting, path dependence processes, network development, and circular and cumulative causation relationships.⁶ Some such theories may originate as universal, abstract 'logical time' models, in which the variables of interest and their theoretical relationships may be assigned time signifiers (t, t-1, etc), and permit a theoretical 'history dependent solution', in the sense of yielding the sequential states or 'evolution' of the system or key variable of interest over abstract 'time'. Such theoretical models and schemas can be applied to particular empirical cases or instances using actual

Table 1. The role and use of history in social science research

Approach	Use of History
History to Theory	The use of historical and longitudinal data, quantitative, qualitative, archival, survey, narrative, to test or modify extant theories, or to identify patterns and regularities that help develop new theories. Correlational versus configurational uses of data.
History in Theory	The use of the past as an integral part of the theoretical model itself. History as prior conditions and form of process itself enters as an explanatory driver. Such theories are typically assumed timeless and general, yet used to explain empirical events and relationships in specific temporal and spatial settings.
Historical Cognizance	Theories and empirical findings influenced and even determined by historical context and contingent on the

⁶ Institutional imprinting is a core concept in organisation science, and refers to situations where organizations are shaped by the historically specific resources and conditions upon which they were founded, and which survive far into the future with those initial structures largely intact because the latter continue to be efficient, or because of inertial forces such as tradition, vested interests, or ideology, or because of a lack of competition (see Stinchcombe 1965). The notion has rarely been used by evolutionary economic geographers.

specific conditions and circumstances of the period studied. Incorporating period-specific effects and processes limits the universality and generalisability of models and findings. Appreciative theorising based on the historical development of particular cases as a method for identifying causal processes.

Note: Based on Kipping and Üsdiken (2014); Argyres et al, (2019).

historical or longitudinal data to assess their evidential 'fit' and causal explanatory power. There is often, then, an interplay between the 'history in theory' and 'history to theory' approaches, with the latter used to empirically verify the former.

While both 'history to theory' and 'history in theory' thus have important uses, Kipping and Üsdiken propose a third perspective, '*historical cognizance*', which can not only enrich those two approaches but also go beyond both, to expand the role of history in explanatory accounts. In the case of 'history to theory', it involves testing or developing new theories not as timeless and universal interpretative frameworks, but by explicitly identifying and conceptualising the influence of *specific* historical periods, as a kind of boundary condition. In the case of 'history in theory', where history becomes a determinant within theory, the aim is not to consider just a kind of generalised past, but a theorised understanding of the *historical particularities and contingencies* of the entities, processes and relationships under analysis. In other words, key theoretical significance is attached to the context of a specific time and place, with the implication that there may be limits to the generalisability of such theoretical accounts to other historical phases and geographical places.

In addition, however, an 'historical cognizance' perspective invites us to fully recognize the complexities of 'historical time' itself, and to move beyond abstract 'logical time' and 'mechanical (chronological) time' to consider what Termini (1981) calls 'historical time'. 'Historical time' is distinguished from 'mechanical time' in that it is measured not in simple chronological units (months, quarters years, etc) but is context dependent and both relative and relational in nature – that is, it is defined and determined by how economic

processes and events themselves unfold and interact under specific historical conditions. The underlying assumption is that the workings out and consequences of a given event or process are not intrinsic to the event or process (that is, independent of time and place), but rather will depend on the nature of the social world and context within which it occurs. This implies that time is heterogeneous, and that different historical periods and eras will have different specific social, economic and political dynamics.

More than this, the notion of 'historical time' admits of the existence of multiple temporalities: different socio-economic processes operate at different speeds and at different spatial scales. As Sewell (2005, 2008) argues, the 'temporality' of capitalism, as a form of economic growth and development, is composite and involves multiple temporal modalities. These include not only slow, linear incremental and cumulative change, but also rhythmic, cyclical, episodic, punctuated and conjunctural forms of change.⁷ These different temporalities not only interact in specific ways in different historical periods but also operate differently at different spatial scales and in different places (Massey, 1992).

The importance of this for evolutionary economic geography is severalfold. Each of the various processes and mechanisms of economic evolution not only have interacting multiple spatialities (local, regional, national, even global) but interacting multiple temporal modalities, or what Adam (2008) refers to as 'timescapes'. Her notion of 'timescape' refers to the 'cluster of temporal features' that characterise and define a particular social or economic process - its time frame, timing, tempo, duration, sequence and modality. The 'scape' part of the concept acknowledges that we cannot embrace time without simultaneously encompassing space and materiality, that is without embodiment in a specific and unique spatial and material setting. And conversely: spatial events and outcomes cannot be fully understood without reference to the specific complex temporalities by which they are produced. How far and in what ways we detect spatial economic evolution will depend on our temporal frameworks, and their 'timescapes' To fully explain the evolution of an economic landscape – whether it be the geographical evolution

⁷ Examples of such different, geographically uneven, temporalities of capitalist economic development and evolution would include, business cycles, crises and crashes, technological revolutions, trade conflicts, major shifts in political-ideological regime, even wars and pandemics.

of a given industry or technology across geographical space, or the evolution of a particular regional economy - over any given historical period, will thus necessitate close examination of what could be several interacting 'timescapes' of generative processes, events and structures having different temporal modalities and multiple spatialities. It is precisely this complexity of evolutionary 'timescapes' that a 'historical cognizance' perspective would seek to unravel.

Examining evolutionary economic geography's achievements through the tripartite schema of Killing and Üsdiken (op cit) is revealing and possibly shows some of the key reasons why its engagement with historical causation has been somewhat disappointing. As Henning (2019) argues, while evolutionary economic geographers have shown signs of becoming more engaged in research with longitudinal data and historical methods, the field has suffered from an apparent dissonance between its avowed ambitions to integrate the dimensions of time, history and space into the empirical content of its research. We agree with Henning's call for more empirical historical work, but we also want to argue that evolutionary economic geography also requires a renewed commitment to providing historical causal explanations of change. Thus far, in both theoretical and empirical terms, the appreciation and exploration of historical processes and different types of temporality, conjuncture and historical change in evolutionary economic geography have been limited. But unless we believe that our theoretical concepts and explanatory schemas apply to all historical periods (and indeed geographical places) regardless of the specificities and particularities of those periods (and places), that is independent of time (and place), then our theories and explanatory schemas need to be explicitly attentive to the specific circumstances and contingencies of a given historical period, and to how those circumstances and specificities themselves change from one historical period to the next. This means not only making better use of historical evidence, but also recognising history itself as a causal process. We now explore these ideas.

'History to Theory': Making Better Use of Historical Evidence in Evolutionary Economic Geography

The key aim of 'history to theory' approaches is to use history to provide empirical evidence for theory testing or development. Historical economic evidence comes in many different forms, both quantitative and qualitative, including regular longitudinal officially collected time series or census data on particular aggregate economic variables (such as industrial employment, output, patents, firm demographics, and the like); archival records of the histories of individual businesses, industries and organisations and their development; historical 'biographies' of particular inventions, innovations and technologies; to mention only some.

On balance, there has been a predilection amongst evolutionary economic geographers for data of a quantitative, variable-based kind. Such data, sometimes in the form of time series - though frequently of restricted historical span and much of it referring to the more recent past - and sometimes in the form of a limited number of successive spatial cross-sections, have been used in different ways. One is the use of such data for what Ermakoff (2019) calls 'morphological' enquiry. This is concerned with the identification and measurement of empirical patterns of phenomena in time and space. Typically, this involves the use of techniques of data formalisation and reduction. In evolutionary economic geography one prominent use of such techniques has been to identify and represent patterns of regional economic structure (of industries, products, or exports), for example by means of deriving indexes of 'related variety' using entropy techniques and other measures, or the use of network adjacency matrix methods to identify and 'map' economic complexity. Such formalised morphological patterns have then been used to infer, probe or test the empirical relevance of causal hypotheses or claims of an evolutionary nature. Thus regional 'related variety' has been hypothesised as a positive determinant of regional innovation, new regional industrial path creation, and regional economic resilience to economic shocks (for example see Frenken et al, 2007; Boschma and Iammarino, 2009; Content and Frenken, 2016).

However, morphological analyses are not unproblematic. Of themselves empirical morphological patterns may not give clear pointers to their causes: a given pattern may be consistent with a variety of causal processes and

mechanisms, just as a given process can produce a variety of empirical outcomes. Thus, to a greater or lesser extent, in practice theoretical ideas and pre-conceptions often shape the choice not only of the data being analysed but also the technique of pattern formalisation used. This is, perhaps, unavoidable, since the search for pattern per se is rarely the sole point of an analysis. Rather, deriving measures of spatial-temporal regularities and patterns is typically with a purpose in mind, namely to test or provide empirical clues for some prior theoretical model or hypothesis concerning regional economic evolution. Nevertheless, the amount of prior theoretical ideas a formal technique of pattern measurement or identification embodies raises the question of the extent to which built-in assumptions shape the empirical patterns found.

A second, and more typical, way in which historical data have been used in evolutionary economic geography is what Ermakoff (op cit) labels as 'variable-centred'. A variable-centred mode of historical causal investigation tests for hypothesised causal relationships from patterns of association among a set of empirical categories or variables. Selecting and constructing such variables using historical data is a non-trivial task. Both temporal and spatial coverage may be limited. For one thing, many economic time series, especially for regions, cities or local geographical areas, are limited in historical length, so that evolutionary processes with long temporalities may be missed altogether. For another, to the extent that different evolutionary processes have different 'timescapes', they may require longitudinal data measured on different time intervals. Further, variable-centred approaches typically assume that the variables representing a given theory or aspect of regional evolution (both the 'dependent' variables and their explanatory 'drivers') have the same meaning across both time and space. This carries the danger of ignoring the historical and spatial context of economic evolution. Notwithstanding such issues, variable-centred research is a common approach in evolutionary economic geography, where time series data on a number of variables are used in multivariate statistical analyses - typically regression models of varying degrees of sophistication - to test the empirical veracity of certain causal models of regional economic change (for example, a substantial majority of the Utrecht University Geography Papers in Evolutionary Economic Geography

now use this approach). Measures of 'related variety', for example, have become a commonly used independent 'explanatory' variable in such models.⁸

The inferential limitations of multivariate regression models are, of course, well known. But in evolutionary economic geography studies some of those limitations can have particular salience. Regression models assume that the basic relationships between the dependent variable and the 'explanatory' independent variables hold across all of the cases (regions) and time periods for which those variables are measured - that is, the causal structure is assumed to be invariant across space and across time, and only the *values* of the different variables can vary spatially and temporally. In other words, the coefficients in such models – the evolutionary processes and relationships those coefficients are meant to represent - are assumed to be spatially and temporally invariant. The longer the time span over which the analysis is conducted, obviously the less this assumption is likely to hold. Indeed, since economic evolution is as much about *qualitative* change as it is about quantitative change, then a more realistic assumption would be that the relationships represented by 'evolutionary' regression models will themselves evolve and change over time. Of course, it is possible to incorporate 'structural breaks' and even 'auxillary parameter models' to capture time-varying relationships in regression models. But this merely points up the incomplete specification of the models as evolutionary descriptions in the first place. A further problem with the use of variable-centred regression models in evolutionary economic geography is that these models assume that the independent explanatory variables are exogenous, when in many instances they are an endogenous part of the very system undergoing evolutionary change.⁹ It is not overly surprising therefore that in many cases they emerge

⁸ Indeed, it seems that the inclusion of some measure of 'related variety' is now all but obligatory in evolutionary economic geography studies. Some might even claim that it is the key concept to have emerged in evolutionary economic geography. Its very inclusion in regression type models is often taken as sufficient to claim the study as being 'evolutionary'. Related variety is, however, a fuzzy concept. There are different definitions, different ways of measuring it empirically, and it is ambiguous in its implications (Frenken et al, 2007; Boschma and Iammarino, 2009; Content and Frenken, 2016). Relatedness between a region's sectors of activity may facilitate recombination, branching, innovation and new path creation. But it may equally encourage structural lock-in, and reduce the structural and knowledge-based modularity and redundancy in a region's economy, reducing its resilience to shocks as a result. Much depends on the specific industries that are related.

⁹ The use of 'related variety' as an independent variable in regressions is a case in point. Related variety is as much an outcome of evolutionary processes and change as it is a determinant, that is

as being statistically significant determinants of the dependent variable being modelled. Again, although various statistical procedures can be used to reduce the endogeneity problem, such as instrumental variables, the more satisfactory solution would be to specify a structural model that captures the interrelationships and feedbacks between different components of the system as a whole.

While much of the work in evolutionary economic geography has relied on quantitative data and variable-centred analysis, there is an important role for qualitative data, narrative modes of argumentation and case-centred approaches. For one thing, formal variable-centred methods, such as regression models, rarely reveal the causative mechanisms that underpin and have generated statistical associations. To investigate those mechanisms will require detailed tracing of the behaviours, decisions, and contexts of the actors, organisations and institutions involved, which investigation is likely to be qualitative in nature (see, for example, [Glückler et al, 2020](#)). For another thing, sometimes the only historical information available on the emergence and development of particular firms, industries or technologies will be of a largely qualitative kind. A variety of techniques for qualitative data analysis are available, although these have not been commonly used in evolutionary economic geography (see [Bathelt and Li, 2020](#)). The work of historians could be interest here. Historians often deal with qualitative data, and particularly for comparative analysis. The techniques of configurational qualitative comparative analysis (QCA) can be useful in those contexts where there exist a limited number of complex cases (see [Berg-Schlosser et al, 2008](#); [Ragin, 1987; 2009](#)). 'Configurational' means that each individual case is considered as a complex combination of properties, a specific 'whole'. In the process of configurational comparative analysis, the researcher engages in a dialogue between cases and relevant theories to identify patterns of association between differences and similarities in the outcome, impact or emergence of some formative event or process across cases in terms of the presence or absence of specified 'causal' factors. Historians have used this approach, for example, to identify the causal determinants of the emergence of revolutions across countries. In evolutionary economic geography, examples of its

it is endogenous, not exogenous. While it may be possible to use the method of instrumental variables to try to allow for this, it once again exposes the limitations of using variable-centred regression methods to test evolutionary theories and the causal claims these theories make.

possible use might include accounting for the emergence of otherwise of an industry or technology across different case-study regions under varying conditioning factors.

3. 'History in Theory': Theorising Historical Processes in Evolutionary Economic Geography

Evolutionary economic geography has made more progress in terms of using 'history in theory' by means of concepts that incorporate the influence of the past (see Table 2). Two main variants of 'history in theory' can be identified (see Üsdiken and Kieser, 2004). The first hypothesises that past events or conditions serve to explain later features and occurrences. In effect, the past becomes a causal influence. The second variant seeks to identify regularities in history and these regularities are then used to explain the course of change. Evolutionary economic geography contains some examples of both types of approach. For example, a substantial number of cluster and entrepreneurial studies draw on micro-studies of the inheritance of firm routines and emphasise the ways in which local spin-off firms inherit routines and experience from their parent firms, and thereby enjoy a higher survival rate than firms without these inheritances (Klepper, 2002). Numerous studies have documented the formation of clusters through spin-off dynamics and historical data has to some degree at least been used to demonstrate how this theory about the inheritance of firm routines has operated (Frenken and Boschma, 2007; Boschma and Frenken, 2011).

It is the use of the notion of path dependence that has often been the way in which evolutionary economic geographers have sought to incorporate history explicitly into their theoretical frameworks. The classic or 'canonical' notion of path dependence, of course, provides an explicit model of historical process in which early or initial decisions and 'accidental' events have long-term, probable consequences that narrow options and may eventually lead to 'lock-in' of economic structures, technologies and organisational forms, and even whole geographical patterns of industry and employment. Ever since Paul David (1985) introduced the idea of path dependence, in his study of the

successful development of the QWERTY typewriter keyboard layout because of its 'first mover advantage', the concept has been used by economic geographers to demonstrate that 'history matters' (for an extensive discussion, see Martin and Sunley, 2006). A key advantage – but also disadvantage – of canonical 'path dependence theory' is that as a process it can be given different interpretations: for example, as a stochastic process (which itself can be modelled as a Markov, or Polya or Bernoulli probability generating mechanism), as an increasing returns process, as technological interrelatedness, as cognitive 'group think', as circular and cumulative causation, and as institutional autopoiesis, among others. Another problematic issue is that the idea of lock-in is frequently interpreted in equilibrium terms (as in David's own work), so that external disruptions or shocks are needed to interrupt the self-reproducing and reinforcing path dependence of the entity or system concerned (Martin, 2010). There is no endogenous mechanism for path breaking or path transformation in the original concept, so evolutionary economic geographers have explored ideas to allow industrial and technological paths to avoid lock-in and to evolve in various ways (Martin, 2010), such as path extension, path layering, path recombination, path renewal, and path plasticity (Martin, 2010; Strambach, 2013; Grillitsch et al, 2018; Isaksen et al, 2018). Another troublesome problem is how paths originate in the first place. To argue they begin in random, serendipitous or happenstance ways is not especially instructive. In fact, the very notion of what constitutes an 'industrial path' has remained rather fuzzy and only loosely defined (see Sunley and Martin, 2022), even if it has proved to be an intuitive metaphor for studying the trajectories of local economic systems.

The development of these, and other, concepts in evolutionary economic geography that seek to give history a causal role is undoubtedly welcome, and has sparked a wide set of valuable new studies. It is not our intention to repeat or survey the extensive literatures that have emerged around some of these 'history in theory' concepts. However, we do want to suggest that several problems and limitations have hindered and obstructed comprehensive explanations of historical causal change and its constituent processes.

An initial problem is whether the concepts have suffered from a tendency to be empirically indeterminate, in the sense that have relied on conceptual constructs that are assumed to be universal, but which in fact are indeterminate. Here we are using Ermakoff's (2017) definition of 'indeterminate concepts'. As Ermakoff puts it, indeterminate concepts "have the epistemic status of a Rorschach blot: indistinct and thus open to multiple interpretations. By way of consequence, we do not know when these concepts are empirically relevant and when they are not. Their meaning is primarily evocative" (2017, p 130). Ermakoff identifies some key problems associated with many indeterminate concepts (see also Markusen, 1999). First, they tend to be prone to reification and become self-enclosed and self-propelling entities. The concepts themselves may appear to become endowed with 'agency'. Second, they tend to attract fuzzy data because the criteria for relevant evidence tend to be very loose. Thus, they may be ambiguous and become impervious to countervailing evidence. Third, they are often associated with theoretical claims that are unconditional in the sense that they do not explain the specific factors that condition the possibility of their occurrence. This assumption of unconditional validity means that the concepts appear to be both true and false at the same time. They appear to be true in some studies where supporting evidence is found, and false in other studies where disconfirming evidence is presented. This is largely because the conditions under which processes are activated are not specified. We appreciate that a degree of uncertainty and ambiguity around abstract concepts is often productive as it can provoke further research and investigation. However, indeterminate concepts can often frustrate and obstruct progress as they may become immune to criticism and so flexible that empirical and theoretical challenge becomes nigh on impossible, which does little to further debate. Often such concepts tend to divide researchers into polarised 'for or against' camps. Many discussions of path dependence, for example, have also suffered from a degree of indeterminism. Studies have often not clearly explained what 'on path' and 'off path' change mean, nor identified the underlying processes that both produce and resist and weaken path dependence (Henning et al, 2013). Path dependence may be enabling of economic evolution or hinder it (see Martin, 2010). The notion of 'weak' path dependence has been used to capture the ways in which agents can manage and modify reinforcing processes and legacies (Fortwengel and Keller, 2020). But in this way, the meaning of path dependence is broadened to such a degree that it becomes indistinct. As we

have noted, recent research has identified a much wider set of categories and types of industrial trajectories, such as path creation, path extension, path renewal, path transplantation. But the empirical meanings of these forms of change and how they emerge from or in response to path dependent change have not always been thoroughly explained and defined. We need to identify different types of change more precisely, and unless clear empirical content is provided for these categories, it will be tempting to reify them rather than diagnosing how they emerge as outcomes of varied processes and conditions. Those studies which have examined the role of agency in these different types of path evolution are therefore welcome as they have sought to explore the 'agency' involved and to unpack the sets of processes behind varied outcomes (see for example, Steen, 2016; Grillitsch and Sotarautu, 2020; Hassink et al, 2019; MacKinnon et al, 2021; Binz and Gong, 2021). Nevertheless, there remains much to do on this front (Sunley and Martin, 2022).

Evolutionary economic geography's thinking on related variety might also benefit from some critical reflection. Part of the strength of relatedness is its fundamental and encompassing nature as a 'driver' of economic change. But there has been some confusion and conflation between 'linear' relatedness through time (diversification into related sectors because of inherited experience), and 'horizontal' related variety as past interaction between two or more sectors or industries producing recombinant diversification (Kuusk and Martynovich 2020 explore a more dynamic approach). To understand knowledge and capabilities in firms as either 'close' (related) or 'distant' (unrelated) may be an overly simple abstraction. It is notable that the definition of 'relatedness' has relied on vague notions of 'proximity' rather than emphasising the importance of agents' interpretations of the past and their construction and use of assets. In contrast, a growing body of organizational work has argued that history is 'the past as interpreted' (Lubinski, 2018; Suddaby et al, 2019), so that it is impossible to judge whether an asset is useful or related unless we understand actors' interpretations and how past lessons are perceived and used. Again, there is a need to move from indeterminate concepts to identify specific historical and causal processes. As Boschma (2017) has argued, because the empirical referents of related diversification are unclear, and blurred with unrelated diversification, it is arguable whether

we can unequivocally distinguish what is 'related' industry change from what is 'unrelated'.

A very similar set of problems apply to the emerging literature on 'complexity' in regional economic studies. As with the notion of 'related variety', economic complexity is in effect regarded as both cause and effect: complexity shapes economic development which then shapes changes in economic complexity, and so on. The danger with this conflation is that spatial economic evolution simply becomes synonymous with changes in the 'complexity networks' of regional economies (whether measure in terms of industries, or products, exports, or technologies, for example). Yet whether and in what ways changes in complexity or related variety over time act as historical causal processes is by no means self-evident. Nevertheless, the use of such morphological measures is rarely critically examined. Indeed, their exponents have been moved to make bold, all-inclusive claims for the concept of economic complexity. Thus Hildago (2021, p. 2) goes so far as to state that, "Measures of economic complexity explain and predict international and regional variations in income, economic growth, income inequality, gender inequality and greenhouse emissions". And some see economic complexity as a 'new paradigm' in evolutionary economic geography (Balland et al, 2022). Our concern with such claims is that what are morphological measures of economic structure are being elevated into universal, all-encompassing causal processes of economic evolution, and risk pushing agents completely out of the picture.

There are important lessons and warnings from these debates. First, we need to make sure that core 'history in theory' concepts are not allowed to become ahistorical 'empty boxes' which are simplistically attributed with causal powers. There are important questions on whether accounts of related variety and economic complexity have fallen into this trap. To identify a potential for change that exists in a place is by no means a comprehensive explanation of why and how that change occurred. To escape this risk we need more specific detailed historically situated studies that demonstrate how agents actually produce different types of 'relatedness', diversification and innovation. Second, we need to be more careful with creating concepts that are so flexible that we can assume that they have an unconditional and universal validity.

Third, there is also a danger that such concepts muddle cause and effect: indeed in many studies what are effects or outcomes are often uncritically interpreted as causes. A far better route to an evolutionary explanation is to explain the conditions, temporalities and spaces under which processes with different 'timescapes' operate and how the realisation of certain outcomes in a place depend on the sequences and interaction of several generative mechanisms and processes.

4. 'Historical Cognizance': Taking Historical Context Seriously in Evolutionary Economic Geography

In our view, then, while evolutionary economic geography has clearly made some uneven progress in terms of the 'history to theory' and 'history in theory' approaches, the types of historical process studied so far have been limited and often characterised by a lack of causal precision and analytical specificity. There has, however, been much less progress in terms of the third approach of 'historical cognizance' in which research examines the specific features of economic change in particular times and places and explains conditional sequences and conjunctures of processes. History is thus not simply another source of data with which to empirically test and modify theories, but has ontological and epistemological implications. As Adam puts it:

What needs to be appreciated from the very start is that taking time seriously is not like a cooking recipe: take space and matter, add on time and stir. Rather, to make time a central feature of your work changes your understanding and your theory at the level of ontology, epistemology and methodology (Adam, 2008, p. 1).

How then to move from 'history to theory' and 'history in theory' to 'historical cognizance'? The key imperative of 'historical cognizance' is to develop a theorized understanding of the historical – and for our discipline, spatial – particularities and contingencies of the relationships and processes under analysis. According to Kipping and Üsdiken (2014) this means, first, that we need to be more explicit and reflective about how we use history. This requires a more critical discussion of the origins and nature of the historical evidence,

and placing and understanding that evidence in its own specific past. Second, 'historical cognizance' implies, even requires, that analysts should look for period effects and historical contingency as part of their explanatory endeavours, and make those particular effects and contingencies an explicit part of theorizing itself. And third, where appropriate, 'historical cognizance' would involve, and benefit from, interacting with theory-conscious economic, business, technology and social historians with expert knowledge in the relevant field of enquiry. Indeed, evolutionary economic geographers could gain much from collaborative inter-disciplinary research with such scholars, to produce richer, and more detailed and contextualised explanations, taking advantage of the skills that those scholars possess (especially in the handling and interpretation of archival materials, and in process tracing methods) and embracing the theoretical and epistemological pluralism that such engagement would entail.¹⁰

As Wadhani (2016) argues, historical contextualization is more than simply identifying the historical boundary conditions that limit the generalisability of certain theories, important though this is.¹¹ It is also an analytical or interpretative activity that involves understanding the relationship between events in their time and place – the 'timescapes' described by Adam (op cit). Historical contextualization in this view is undertaken for different purposes by economic agents themselves as well as by scholars. It is a process which involves both periodization and the assignment of historical logics. Periodization is inherent to contextualization as it defines the context in which events ought to be understood and it is an interpretative process in which developments in the past are organised into coherent historical periods, phases, eras, epochs and the like. But historical contextualization also involves the attribution of causal relationships or semantic meanings between developments over time. Wadhani (2016) terms these relationships 'historical logics' and identifies three types – structural, sequential/contingent, and constitutive. Structural logics are those in which past events or developments constrain and determine subsequent actions, such as in path dependence.

¹⁰ For both the argument for and potential benefits of greater pluralism in economic geography generally, see Martin (2021)

¹¹ As recent debates on comparative urbanism have shown, it is important that we recognise all theories as being derived from a time and place, both to avoid universalisms and anachronisms that are blind to context and difference, and to recognise that we need to learn theory from a much more diverse variety of places (see Robinson, 2016).

Sequential or contingent historical logics typically involve a focus on key moments of change and examine the confluence of actions and developments that make change possible. This includes watershed moments and moments of crisis or disruption where the recursive interactions between action and context are key. Finally, constitutive logics focus on how actors themselves understand and represent the past, how they manage history, and how this shapes their future actions and decisions. There has been a rapid growth of such interests recently in business and entrepreneurial history (for example, Suddaby et al, 2019; Lubinski, 2018; Wadhvani et al, 2018).

To date, evolutionary economic geography has seemed surprisingly reluctant to engage with some of these types of contextualization, and has often eschewed any effort at periodisation. It has certainly engaged with structural logics of path dependence, and, moreover, some recent studies of path creation have thrown light on some of the sequential/contingent logics in the emergence of new industries and clusters, in terms of leadership, institutional entrepreneurship and collaboration around shared visions, (Grillitsch and Sotarauta, 2020; Heiberg et al, 2021). However, the lack of periodisation as a context for much of this work has been telling. Many studies have tended to focus on only one type of temporality relating to the birth and development stage and maturity of firms, and have been averse to identifying any longer period effects which condition firm-based processes. The lack of studies over a long expanse of time has restricted the depth of explanation. For example, there has been little work on how long-term institutional conditions and changes have shaped the evolution of different places. Little attention has been given to the progress of financialisation over several decades and how this has changed the logics and quality of investment, the balance between investment and speculation, the contexts of firm survival and strategy, and the power relations in the economy. Until recently, indeed, there has been very little engagement with long term changes in the very character of capitalism, so that the relationships between firm decisions and trajectories, and political-economic and financial regimes have typically been deemed outside the scope of investigation (MacKinnon et al, 2009). There are welcome signs that this may be changing with expanding interest in the diffusion and spread of the 'fourth industrial revolution' (for example, De Propris and Bailey, 2021; Balland and Boschma, 2021), as well the character of global production networks, and the absorption of some longer-term and institutional

temporalities and transitions (Gong and Hassink, 2019; MacKinnon et al, 2019). Nevertheless, despite these signs, contextual periodisation remains underdeveloped.

The underlying reasons for this uneven progress may lie in evolutionary economic geography's reliance on Ermakoff's (op cit) morphological and variable-centred modes of explanation as outlined above, and the relative weakness of studies that come close to his third historical mode which he labels 'genetic'. This mode of historical analysis seeks to establish causality through the detailed investigation of generative processes. Such studies need to theorize the connections between contexts and outcomes by unpacking the mechanisms involved, and then validate this theory by tracing the generative process in time. This requires a dynamic and sequential approach to identify both mechanisms and the conditions and contextual factors under which a generative process is likely to take place. As Ermakoff puts it, "We can hardly claim to have theorized a mechanism if we leave the factors that condition its likelihood unspecified" (ibid, page 592). Ermakoff himself calls for a micro-perspective and a high degree of analytical specificity by tracing a cause through actors' behaviours motivations and beliefs. This type of *process tracing* may either examine actors' schemes of thought, dispositions and strategies over the medium or long range, or focus on moments of change and confrontation punctuating a longer-term temporality. Such an approach might use both observable outcomes and simulation methods. In effect, this recommends an in-depth process tracing approach which disassembles theoretical processes into their constituent parts and identifies the causal relationships that bind actors' activities in particular cases, or a small number of cases.

While there are many continuing debates about the precise meaning of process tracing, about its methodology, and its different variants (see Hall, 2013; Beach, 2016; 2017; Bennett and Checkel, 2015), in our opinion, a more serious engagement with this type of 'genetic' (generative process and causal mechanism) approach would yield benefits by broadening the scope of evolutionary economic geography, rather than privileging a single approach or methodology. Just as a more serious integration of history in business and organization studies has led to a greater plurality of methods and concerns (Maclean et al, 2016; Decker et al, 2015), so we believe more historical

cognizance would widen the tools used and questions posed by evolutionary economic geography. A generative process approach would certainly encourage more narrative style explanations in which the expression of theoretical ideas and causal claims is embedded within an unfolding story. Narrative approaches privilege historical argumentation over formal theorizing, but can nevertheless yield testable propositions through the ordering and analysis of historical evidence. Maclean et al (2021), for example, argue that narrative inquiry allows inductive generalization on the basis of specific cases which can be used to generate powerful new theoretical constructs, and cite David's (1985) initial work on the QWERTY keyboard as the basis of his theory of path dependence as an example. The key aim for analytic narratives is to combine theory with historical rigour in order to provide a meaningful interpretation of complex causality, and question the plausibility of theoretical frameworks. Narratives can both highlight problems and silences in theories and, conversely, diverse and meaningful stories provide fertile ground for theoretical imagination and generation. This type of narrative research may also be used to explain the origins and form of many contemporary phenomena as it permits a high degree of context sensitivity in explaining their origins and emergence. There have, of course, been some highly influential studies in economic geography that employ a more narrative type of approach, (for example see Bathelt and Boggs, 2003; Glaeser, 2005; Grabher, 1993; Saxenian, 1994; Storper et al, 2015; and Krugman, 1991 on the case of Dalton) but this type of interpretative story-telling has tended to be overshadowed by more variable-centred approaches.

A related way in which a more generative and process tracing approach might well be pursued is through the wider adoption of 'history-friendly' models. Such models are based on 'appreciative theorizing' with some elements of story-telling, and move away from general and abstract evolutionary models to represent, and in some cases simulate, using agent-based models, how specific actors and firms in different contexts have evolved and have been affected by institutional, technological and market environments (see Malerba et al, 2008; 2016; Capone, et al, 2019). Such models use detailed case studies to trace the specific historical, institutional, technical and market conditions that shape the evolution of particular firms and industries. They have mostly been used in only a limited range of studies, such as the computer industry and the pharmaceutical industry, but there are many ways in which

appreciative-theory based comparative study of sequences and contingencies in industry paths in different places could be strengthened through the development and modification of such models (Sunley and Martin, 2022). Another possibility is to view individual regions as cases, and apply appreciative theorizing in analysing their long-run economic. The methodology of contrastive comparisons in this context could be particularly insightful.

Perhaps one of the primary consequences of the lack of process tracing and narrative approaches in evolutionary economic geography has been a lack of studies of agents' interpretations and experiences. Rather, they have, in a sense, divorced a set of universal mechanisms from agents' experiences, narratives and understandings, and hence their agency. Some authors have challenged this divorce (see Bristow and Healy; 2015; Chlebna and Simmie 2018). However, despite the dramatic changes and increasing spatial inequalities seen in experiences of economic life in recent years, these experiences seem to rarely figure in our studies. In some ways this is surprising as much of the motivating theory for evolutionary economic studies emphasises that capabilities and conventions, which are best defined as shared social practices, informal relationships and inherited lessons, are the ultimate sources of economic change. But these shared practices, understandings and conventions are more often invoked as a residual 'empty box' than studied rigorously (Sunley and Martin, 2022; Grillitsch et al, 2021). Broadening the scope of evolutionary economy geography to include more studies of historical informal institutions and experience is likely to yield some valuable insights. Without an understanding of economic actors' experiences, rhetorics and use of history, any evolutionary approach is bound to fall short of understanding more constitutive logics. Moreover, without studying experience, economic geography will be hard pressed to say whether economic evolution is in any way socially progressive or inclusive. Understanding the relationships between innovation, economic change, and welfare and wellbeing, requires a more systematic engagement with actors' experiences.

6. Conclusions: Moving Forward by Making History Matter

The central theme in this paper has been that there exists both a strong case and considerable scope for making more use of history in empirical and theoretical work in evolutionary economic geography. In developing this argument, we have drawn on ideas and discussions from a range of other disciplines, such as organisational studies, business and management studies, sociology, and political science, where historical modes of investigation have been attracting increasing attention. This 'historical turn' may not be based on any 'evolutionary' ontology as such, but these disciplines are nevertheless concerned with using and problematising history in order to better understand processes of social, business and organisational change and transformation over time.

Our argument here is that evolutionary economic geographers have yet to fully explore how best to use history in constructing their explanatory accounts. Drawing on Kipping and Üsdiken's (2014) discussion of the three main ways in which history could advance explanation in management and organisation studies ('history to theory', history in theory' and 'historical cognizance'), we suggest that evolutionary economic geographers could do more on all three fronts. They should make much greater use of historical data to test or help develop theories, not just quantitative data but qualitative data, archival records, documented business and industrial histories, and other such information. In too many studies, 'history' is truncated to data from the recent past or limited to short quantitative 'time series'. They should also give more attention to making history play a greater explanatory role in their theorisations of spatial economic evolution, recognizing the different temporalities and timescapes of evolutionary and development processes, mechanisms and events. And thirdly, and perhaps most importantly, we would urge that evolutionary economic geography work should cultivate a heightened degree of 'historical cognizance', a willingness to delve into the spatial and historical contexts in which economic change has unfolded and economic agents have made key decisions, and to trace the multi-scalar and multi-temporal generative processes and sequences involved. This 'generic' mode of historical causal investigation (Ermakoff, 2019) creates greater space for case-study research, appreciative theorising and narrative methods.

This is not to devalue more formal, quantitative variable-centred types of enquiry, but it is to recognise the limitations of such methods to uncover the

detailed context-dependent processes at work. At a time when it seems that variable-centred methods are increasingly being used in evolutionary economic geography, together with some fairly indeterminate concepts, the danger - in our view - is that the subdiscipline becomes a technical exercise in quantitative analysis (typically involving multivariate regression). In contrast to formal theorising and variable-centred research, and the associated aim of using numerous cases ('large n') to establish explanatory generalisations, appreciative theorising stays close to the empirics of a particular case, or at most a very limited number of cases ('very small n'), and proceeds by using a narrative-based approach to uncover in depth the generative processes, events, and actors' decisions that account for the evolutionary unfolding of that particular case (or very few cases). The aim initially is not to pursue generalisations, but to thoroughly understand the historical and spatial specifics of the single case (or very small number of cases). Further, narratives can have causal power. They are analytic constructs (or 'colligations') that unify a number of past or contemporaneous actions and happenings, which might otherwise have been viewed as discrete or disparate, into a coherent relational whole that gives meaning to and explains each of its elements and is, at the same time, constituted by them (Griffin, 1993; Calhoun, 1998; Abbott, 2001). In narratives, we can see how the cumulative consequences of past actions constrain and limit future action. We can also see the emergence of novelty in narrative, those contingent, unpredictable acts, often with significant consequences, that are nonetheless explicable in light of temporal ordering and connectedness. Thus, through the way it organizes information and fosters understanding of sequentially unfolding action, narrative encourages an explicit deployment of temporal causation. Thus constituted, appreciative narrative explanations can then help inform theoretical schemas and sharpen concepts which can be used to test other cases, including contrastive cases, and point to some common regularities and processes that admit of (limited) generalisation and quantitative analysis (under specific conditions and contexts).¹² It is our contention, therefore, that historical modes of causal investigation involving appreciative theorising and narrative deserve greater attention. If 'history matters', as is often stated in evolutionary

¹² And, of course, appreciative theorising rarely commences in a theoretical 'vacuum', and can itself draw on evolutionary and other concepts to help frame case-study narratives.

economic geography, a greater use of such approaches could help to make it matter.

Finally, the lessons of these debates are that a wider engagement with different temporalities and narratives of change in economic geography is likely to not only provide us with a better understanding of processes of past change, it is also likely to highlight the importance of expectations and visions of the future. As Levy (2021) has recently argued, capitalism is a forward-looking system in the sense that projections of the future shape valuations of assets, and hence the processes of capital accumulation: “The present in a capitalist economy is thus determined by a mixture of past expectations, still working themselves out through actions, and present expectations that relate future horizons, of various duration, back to the present. If expectations rule, then individual and collective psychological projections of the future play a dynamic role in a capitalist economy” (p. xvi). But as evolutionary economic theory implies, these uncertain expectations are not distinct from interpretations of the past as they are constituted from narratives of the past, and the ways in which they are rehearsed, reworked or rejected. Expectations and narratives about future projects are central to their legitimation (Garud et al, 2014). There are some growing signs that evolutionary economic geographers are starting to consider the ways in which narratives fuse past experiences with future expectations in place (see Lund and Vildåsen, 2022; MacKinnon et al, 2021; Steen, 2016). In our view there is thus much to be learned from examining narratives and expectations in different regions in order to understand how they steer investment and disinvestment. Expectations of the future should be taken more seriously by economic geographers if we are to understand the causal mechanisms and evolutionary processes that animate and produce the outcomes mapped in many variable-based analyses. Paradoxically then, a further benefit of engaging with a wide set of history-informed methods and narratives in economic geography is that they might reveal more on how agency in economic evolution depends on projections of the future, and how these projections vary across the economic landscape, as they are constructed by different collectives of actors in different ways with different histories.

References

Abbott, A. (2001) *Time Matters: On Theory and Method*, Chicago: University of Chicago Press.

Adam, B. (2008) Of timescapes, futurescapes and timeprints, Presentation given at Lüneburg University, 17 June.
<https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.594.1289&rep=rep1&type=pdf>

Argyres, N., De Massis, A., Foss N., Frattini, F. Jones, G., Silverman, B. (2019) History-informed strategy research: The promise of history and historical research methods in advancing strategy research, *Strategic Management Journal* 41, 3, 343-368.

Balland, P-A. and Boschma, R. (2021) Mapping the potentials of regions in Europe to contribute to new knowledge production in Industry 4.0 technologies, *Regional Studies* 55, 10-11, 1652-1666.

Balland, P., Broekel, T., Diodata, D., Giuliani, E., Hausmann, R., O’Cleary, N. and Rigby, D. (2022) The new paradigm of economic complexity, *Research Policy* 51, 3, 104450.

Bathelt, H. (1994) The significance of regulation theory to economic geography (Die bedeutung der regulationstheorie in der wirtschaftsgeographischen forschung), *Geographische Zeitschrift*, 82, 63–90

Bathelt, H. and Boggs, J.S. (2003) Towards a reconceptualisation of regional development paths: is Leipzig’s media cluster a continuation of or a rupture with the past? *Economic Geography* 79, 265-293.

Bathelt, H. and Glückler, J. (2003)

Bathelt, H. and Glückler, J. (2017)

Bathelt, H. and Li, P. (2020) Building better methods in economic geography. *Zeitschrift für Wirtschaftsgeographie* 64, 3, 103-108.

Beach, D. (2016) It's all about mechanisms- what process-tracing case studies should be tracing, *New Political Economy* 21, 5, 463-472.

Beach, D. (2017) Process-Tracing Methods in Social Science, *Oxford Research Encyclopaedia of Politics*
<https://doi.org/10.1093/acrefore/9780190228637.013.176>

Bennett, A., and Checkel, J. (Eds) (2015) *Process Tracing in the Social Sciences: From Metaphor to Analytic Tool*, Cambridge, UK: Cambridge University Press.

Berg-Schlosser, D., De Meur, G., Rihoux, B. and Ragin, C. (2009) Qualitative comparative analysis as an approach, in Rihoux, B. and Ragin, C. (Eds) *Configurational Comparative Methods: Qualitative Comparative Analysis and Related Techniques*, New York: Sage, 1-18.

Binz, C. and Gong, H. (2021) Legitimation dynamics in industrial path development: New to the world versus new-to-the-region industries, *Regional Studies*, doi: 10.1080/00343404.2020.1861238.

Boschma, R.A. (2017) Relatedness as a driver of regional diversification: A research agenda, *Regional Studies* 51, 3, 351-364.

Boschma, R.A. and Frenken, K. (2007) A theoretical framework for evolutionary economic geography: industrial dynamics and urban growth as a branching process, *Journal of Economic Geography* 7, 5, 635-649.

Boschma, R.A. and Frenken, K. (2011) The emerging empirics of evolutionary economic geography, *Journal of Economic Geography* 11, 2, 295-307.

Boschma, R. A. and Iammarino, S. (2009) Related variety, trade linkages, and regional growth, *Economic Geography* 85, 3, 289-311.

Boschma, R.A. and Martin, R.L. (2010) (Eds) *Handbook of Evolutionary Economic Geography*, Cheltenham: Edward Elgar.

Bristow, G. and Healy, A. (2015) Crisis response, choice and resilience: insights from complexity thinking, *Cambridge Journal of Regions, Economy and Society* 8, 241-256.

Calhoun, C. (1998) Explanation in historical sociology: narrative, general theory and historical specific theory, *American Journal of Sociology*, 104, 846-871.

Capone, G., Malerba, F., Nelson, R.R, Orsenigo, L. and Winter, S.G (2019) History friendly models: retrospective and future perspectives, *Eurasian Business Review*, 9, 1-23.

Chlebna, C. and Simmie, J. (2018) New technological path creation and the role of institutions in different geo-political spaces, *European Planning Studies* 26, 5, 969-987.

Coe, N. (2011) Geographies of production I: An evolutionary revolution? *Progress in Human Geography*, 35, 81-91.

Content, J. and Frenken, K. (2016) Related variety and economic development: A literature review, *European Planning Studies* 24, 2097-2112.

Dawley, S., MacKinnon, D. and Pollock, R. (2019) Creating strategic couplings in global production networks: regional institutions and lead firm investment in the Humber region, UK, *Journal of Economic Geography* 19, 4, 853-872.

Decker, S. Kipping, M. and Wadhani, R.D. (2015) New business histories! Plurality in business history research methods, *Business History* 57, 1, 30-40.

DePropris, L. and Bailey, D. (2021) Pathways of regional transformation and Industry 4.0, *Regional Studies* 55 10-11, 1617-1629.

Ermakoff, I. (2017) Shadow plays: theory's perennial challenges, *Sociological Theory*, 35, 128-137.

Ermakoff, I. (2019) Causality and history: Modes of causal investigation in historical social sciences, *Annual reviews of Sociology*, 45, 581-606.

Frenken, K. and Boschma, R.A. (2007) A theoretical framework for evolutionary economic geography: industrial dynamics and urban growth as a branching process, *Journal of Economic Geography* 7, 635-649.

Frenken, K., Van Oort, F., and Verburg, T. (2007) Related variety, unrelated variety and regional economic growth, *Regional Studies* 41, 5, 685-697.

Fortwengel, J. and Keller, A. (2020) Agency in the face of path dependence: how organizations can regain scope for maneuver, *Business Research* 13, 1169-1201.

Garud, R., Schildt, H. and Lant, T. (2014) Entrepreneurial storytelling, future expectations, and the paradox of legitimacy, *Organization Science* 25, 5, 1479-1492.

Glaeser, E.L. (2005) Reinventing Boston:1630-2003, *Journal of Economic Geography* 5, 2, 119-153.

Glückler, J., Punstein, A. M., Wuttke, C., and Kirchner, P. (2020) The 'hourglass' model: An institutional morphology of rural industrialism in Baden-Württemberg, *European Planning Studies*, 28, 1554–1574.

Gong, H. and Hassink, R, (2019) Co-evolution in contemporary economic geography: towards a theoretical framework, *Regional Studies* 53, 9, 1344-1355.

Grabher, G. (1993) 'The Weakness of Strong Ties: The Lock-in of Regional Development in the Ruhr Area', in G. Grabher (ed), *The Embedded Firm: On the Socioeconomics of Industrial Networks*. London: Routledge, 255-277.

Griffin, L. J. (1993) Narrative, event-structure and causal interpretation in historical sociology, *American Journal of Sociology*, 98, 1094-1133.

Grillitsch, M., Asheim, B. and Trippel, M. (2018) Unrelated knowledge combinations: the unexplored potential for regional industrial path development, *Cambridge Journal of Regions, Economy and Society* 11, 2, 257-274.

Grillitsch, M., Martynovich, M., Fitjar, R, Haus-Reve, S. (2021) The black box of regional growth, *Journal of Geographical Systems* 23, 425-464.

Grillitsch, M. and Sotarauta, M. (2020) Trinity of change agency, regional development paths and opportunity spaces, *Progress in Human Geography* 44, 4, 704-723.

Hall, P.A. (2013) Tracing the progress of process tracing, *European Political Science* 12, 20-30.

Hall, P. (1962) *The Industries of London since 1861*, London: Hutchinson.

Hassink, R., Isaksen, A. and Trippel, M. (2019) Towards a comprehensive understanding of new regional path development, *Regional Studies* 53, 11, 1636-1645.

- Hassink, R. Klaerding, VC. and Marques, P. (2014) Advancing evolutionary economic geography by engaged pluralism, *Regional Studies*, 48, 1295-1307.
- Heiberg, J., Binz, C. and Truffer, B. (2021) The geography of technology legitimation: How multi-scalar institutional dynamics matter for path creation in emerging industries, *Economic Geography* 96, 5, 470-498.
- Henning, M., Stam, E. and Wenting R. (2013) Path Dependence research in regional economic development: Cacophony or knowledge accumulation? *Regional Studies* 47, 8, 1348-62.
- Henning, M. (2019) Time should tell (more): evolutionary economic geography and the challenge of history, *Regional Studies*, 53, 602-613.
- Henning, M. (2022) *Regional Evolution*, Newcastle: Agenda Publishing.
- Hildago, C (2021) Economic complexity theory and applications, *Nature Reviews Physics*, <https://doi.org/10.1038/s42254-020-00275-1>
- Hodgson, G. (2019) *Evolutionary Economics: Its Nature and Future*, Cambridge: Cambridge University Press.
- Isaksen, A., Tödting, F., and Trippel, M. (2018) Innovation policies for regional structural change: combining actor-based and system-based strategies. In Isaksen, A, Martin, R. and Trippel, M. (Eds.) *New Avenues for Regional Innovation Systems – Theoretical Advances, Empirical Cases and Policy Lessons*, 221–238. Cham: Springer.
- Kipping, M. and Üsdiken, B. (2014) History in organisation and management theory: more than meets the eye, *Academy of Management Annals*, 8, 535-588.
- Klepper, S. (2002) The capabilities of new firms and the evolution of the US automobile industry, *Industrial and Corporate Change*, 11, 4, 645-666.
- Knight, F. H. (1935) *The Ethics of Competition and Other Essays*, London: George Allen and Unwin.
- Kogler, D. (2015) Evolutionary economic geography – theoretical and empirical progress, *Regional Studies* 49, 705-711.
- Levy, J. (2021) *Ages of American Capitalism: A History of the United States*, New York: Random House.

Lubinski, C. (2018) From 'History as Told' to 'History as Experienced': Contextualizing the uses of the past, *Organization Studies* 39, 12, 1785-1809.

Lui, Z. (2009) *Bringing History into Evolutionary Economic Geography for a Better Understanding of Evolution*, Papers in Evolutionary Economic Geography 09/01, Urban and Regional Research Centre, Utrecht University.

Lund, H. and Vildåsen, S. (2022) The influence of Industry 4.0 narratives on regional path development, *Regional Studies, Regional Science* 9, 1, 82-92.

Kieser, A. (1994) Why organization theory needs historical analyses - and how this should be performed, *Organization Science* 5, 608-20.

Krugman, P. (1991) *Geography and Trade*, Leuven: Leuven University Press.

Kuusk, K. and Martynovich, M. (2021) Dynamic Nature of Relatedness, or What Kind of Related Variety for Long-Term Regional Growth *Tijdschrift voor Economische en Sociale Geografie* 112, 1, 81-96.

Maclean, M., Harvey, C. and Clegg, S., (2016) Conceptualizing historical organization studies, *The Academy of Management Review* 41, 4, 609-632.

Maclean, M., Harvey, C., Suddaby, R. and Clegg, S. (2021), Historical Organization Studies: Advancing new directions for organizational research, Chapter 1 in Maclean, M., Clegg, S. Suddaby, R. and Harvey, C., (Eds) *Historical Organization Studies*, London: Routledge, 3-22.

MacKinnon, D., Cumbers, A., Pike, A., Birch, K. and McMaster, R. (2009) Evolution in economic geography: institutions, political economy and adaptation, *Economic Geography*, 85, 129-150.

MacKinnon, D., Dawley, S., Pike, A. and Cumbers, A. (2019) Rethinking path creation: A geographical political economy approach, *Economic Geography* 95, 2, 113-135.

MacKinnon, D., Karlsen, A., Dawley, S. Steen, M., Afewerki, S. and Kenzhegaliyeva, A. (2021) Legitimation, institutions and regional path creation: a cross-national study of offshore wind, *Regional Studies*, 10.1080/00343404.2020.1861239

Malerba, F., Nelson, R.R., Orsenigo, L., and Winter, S.G., (2008) Vertical integration and disintegration of computer firms: A history-friendly model of the coevolution of the computer and semiconductor industries, *Industrial and Corporate Change* 17, 197-231.

Malerba, F., Nelson, R.R., Orsenigo, L., and Winter, S.G. (2016) *Innovation and the Evolution of Industries: History Friendly Models*, Cambridge University Press, Cambridge, UK.

Markusen, A. (1999) Fuzzy concepts, scanty evidence, policy distance: the case for rigour and relevance in critical regional studies, *Regional Studies* 33, 869-884.

Martin, R.L. (2010) Rethinking regional path dependence: from Lock-in to evolution, The 2009 Roepke Lecture in Economic Geography, *Economic Geography*, 86, 1, 1-27.

Martin, R.L. (2021) Putting the case for a pluralistic economic geography, *Journal of Economic Geography*, 21, 1-28.

Martin, R.L. and Sunley, P.J. (2006) Path dependence and regional economic evolution, *Journal of Economic Geography*, 6, 395-437.

Martin, R.L. and Sunley, P.J. (2015) Towards a Developmental Turn in Evolutionary Economic Geography?, *Regional Studies* 49, 5, 712-732.

Martin, R.L. and Sunley, P. J. (2022) Why an evolutionary economic geography? The spatial economy as a complex evolving system, Forthcoming in Dopfer, K. (Ed) *The Research Agenda for Evolutionary Economics*, Cheltenham: Edward Elgar.

Massey, D. (1992) Politics and Space/Time, *New Left Review*, 196, 65-84.

Nelson, R. (2020) A perspective on the evolution of evolutionary economics, *Industrial and Corporate Change*, 29, 1101-1119.

Pavord, A. (2016) *Landskipping: Painters, Ploughmen and Places*, London: Bloomsbury.

Peck, J. (2000) Doing regulation, in Clark, G. L., Feldman, M.P. and gertler, M. (Eds) *The Oxford Handbook of Economic Geography*, Oxford: Oxford University Press, 61-80.

Pike, A., Cumbers, A., Dawley, S., MacKinnon, D. and McMaster, R. (2016) Doing evolution in economic geography, *Economic Geography* 92, 2, 123-144.

Potts, J (2021) How heterodox economics lost its way, *Journal of Economic Issues*, LV, 590-594.

Ragin, C. (1987) *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies*, Berkeley: University of California Press.

Ragin, C.: (2009) Reflections of casing and case-orientated research, in Byrne, D. (Ed) *The Sage Handbook of Case-Based Methods*, New York: Sage, pp. 522-534.

Robinson, J. (2016) urbanism: New geographies and cultures og theorizing the urban, *International Journal of Urban and Regional Research* 40, 1, 187-199.

Saxenian, A-L. (1994) *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*, Cambridge Mass.: Harvard University Press.

Schamp, E. (2017) Evolutionary Economic Geography, *International Encyclopedia of Geography: People, the Earth, Environment and Technology* <https://doi.org/10.1002/9781118786352.wbieg0997>

Schumpeter, J.A. (1949) Economic theory and entrepreneurial history, in Wohl, R.R. (Ed) *Change and the Entrepreneur: Postulates and Patterns for Entrepreneurial History*, Cambridge, Mass: Harvard University Press, 63-84.

Sewell, W. H. (1990) Three Temporalities: Towards a Sociology of the Event, *Mimeo*, Paper Presented at a conference on "The Historic Turn in the Human Sciences," University of Michigan, October 1990.

Sewell, W.H. (2005) *Logics of History, Social Theory and Social Transformation*, Chicago: University of Chicago Press.

Sewell, W. H. (2008) The temporalities of capitalism, *Socio-Economic Review*, 6, 517-537.

Sicotte, D.M. (2016) The importance of historical methods for building theories of urban environmental inequality, *Environmental Sociology*, 2, 254-264.

Steen, M. (2016) Reconsidering path creation in economic geography: aspects of agency, temporality and methods, *European Planning Studies* 24, 9, 1605-1622.

Stinchcombe, A. L. (1965) Social structure and organizations, in March, J. G. (Ed) *Handbook of Organizations*, New York: Rand McNally, 142–93.

Storper, M., Kemeny, T., Makarem, N. and Osman, T., (2015) *The Rise and Fall of Urban Economies: Lessons from San Francisco and Los Angeles*, Stamford: Stanford University Press.

Strambach, S. (2013) Reconceptualising change: path dependency, path plasticity and knowledge combination, [Zeitschrift für Wirtschaftsgeographie](#), 57, 1-14.

Suddaby, R., Coraiola, D., Harvey C. and Foster, W. (2019) History and the micro-foundations of dynamic capabilities, *Strategic Management Journal* 41, 530-556.

Sunley and Martin, (2022) Place and industrial development? Paths to understanding? In P. Bianchi, S. Labory and P. Tomlinson (Eds) *Handbook of Industrial Development*, Cheltenham: Edward Elgar.

Termini, V.A. (1981) Logical, mechanical and historical time in economics, *Economic Notes*, 10, No.3 (Mimeo, University of Sienna), https://mpra.ub.uni-muenchen.de/24491/1/MPRA_paper_24491.pdf.

Üsdiken, B. and Kieser, A. (2004) Introduction: history in organisation studies, *Business History*, 46, 321–30.

Wadhani, R.D. (2016) Entrepreneurship in historical context: using history to develop theory and understand process, Chapter 6 in F. Welter and W. Gartner (Eds) *A Research Agenda For Entrepreneurship and Context*, Elgaronline.

Wadhvani, R.D., Kirsch, D., Welter, F. , Gartner, W.B. and Jones, G.G.(2020) Context, time and change: Historical approaches to entrepreneurship research, *Strategic Entrepreneurship Journal*, doi:10.1002/sej.1346

Wimmer, A. and Kössler, R. (Eds) (2006) *Understanding Change: Models, Methodologies and Metaphors*, Basingstoke: Palgrave Macmillan.

Winter, S. (2014) The future of evolutionary economics: can we break out of the beachhead? *Journal of Institutional Economics*, 10, 613-644.

Witt, U. and Chai, A. (2018) Evolutionary economics: taking stock of its progress and emerging challenges, in Witt, U. and Chai, A. (eds) *Understanding Economic Change: Advances in Evolutionary Economics*, Cambridge: Cambridge University Press, 3-34.