Context sensitivity and economic-geographic (re)theorising

Huiwen Gong and Robert Hassink

Department of Geography, Kiel University, Hermann-Rodewald Str. 9, 24098 Kiel, Germany, gong@geographie.uni-kiel.de, hassink@geographie.uni-kiel.de

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Drawing upon critical realism and the literature on theorising in social sciences, this article contributes to the understanding of theorising in economic geography by highlighting the role of context throughout the theory development process. By critically reviewing two key concepts in economic geography—related variety and knowledge bases—from a critical realist theory development perspective, scholars’ sensitivity to local context through the whole theorising process is examined. We argue that the particular strength of economic geography with regard to advancing theory lies in the continuous application of concepts and theories (that is, generalities) within new contexts (that is, confrontation with new particularities).

Keywords: economic geography, theorising, critical realism, context, knowledge bases, related variety

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Introduction

Economic geography is essentially about describing, analysing and explaining economic activities in real places. Although suffering from fragmented pluralism (Barnes and Sheppard, 2010; Hassink et al., 2014a; Bathelt et al., 2017; Hassink and Gong, 2017; Barnes and Christophers, 2018), most modern perspectives, narratives and paradigms in economic geography, such as relational, institutional economic approaches, geographical political economy, alternative economic geographies and feminist geographies, share a critical stance towards positivistic thinking in geographical economics. They also shy away from grand theories. They criticise universal spatial laws developed by geographical economists, which are argued to be able to predict the behaviour and decisions of economic actors in any place (neutral, frictionless space), disregarding context (Martin, 2011; Hassink and Gong, 2019). Instead, they emphasise the importance of geographical context, particularity and differentiation, as well as historical contingency. According to Rodríguez-Pose (2011, 352), ‘for geographers…space is relative and variable and this makes context king. The multiplicity of interactions occurring at diverse geographical scales and the variegated spatial forms they generate mean that… “one-size-fits-all” approaches are anathema…’.
Asheim (2020) even considers economic geography as a form of ‘contextual analysis’, and similarly, Sunley (1996) as a ‘contextual approach’. However, what is ‘context’ in economic geography then? In very general terms, context in human and economic geography is defined as associated objects and events of/in social life, situated in specific or particular spatial and temporal settings (see Hägerstrand, 1974; Thrift, 1983, 1996; Gregory et al., 2009; Storper, 2009; Rogers et al., 2013; Autio et al., 2014; Cox, 2014). Context is not seen as a passive backdrop, but something that can be actively changed and constructed. More specifically, Sunley (1996), pointed to two meanings of context in economic geography. First, the object of economic geographical empirical research is embedded in context. Second, theories are embedded in (institutional and academic) contexts and therefore to some extent constructed. Similar to these authors, we see context as the wider settings (subject to changes) in which key objects and events are embedded (for example, in specific regions, countries, time periods etc.).

However, despite the general definition given above, we acknowledge that ‘context is one of those polysemic terms that means multiple things in geographical discourse’ (Castree, 2005, 542). Even within economic geography, although starting from a general understanding of context, depending on the research interest and training background of scholars, different kinds of contexts are emphasised in research. In evolutionary economic geography, for example, scholars focus very much on the micro context (for example, organisational routines, industrial preconditions and structures) (see Boschma and Frenken, 2006, 291). For institutional economic geographers, context mainly refers to the formal and informal institutions present in a region (Martin, 2000; Gertler, 2003), whereas for scholars from geographical political economy, the macro structures (for example, capitalism, the role of the state) are seen as the context for uneven development in space (Pike et al., 2016; MacKinnon et al., 2019). While the evolutionary approach has become very influential in the last 15 years or so, we share many scholars’ arguments that the key emphasis of economic geography, as a sub-discipline of human geography, needs to be placed on the macro and meso socio-economic and institutional contexts. It is in the latter that the micro-level activities of firms and organisations are embedded (Hassink et al., 2014a; Martin and Sunley, 2015; Pike et al., 2016).

The strong emphasis on context, however, might lead to the ‘…risk that such analyses simply observe geographical specificity…as an empirical matter-of-fact without engaging with…fully explaining such differences. This in turn may unduly limit the contribution of geographical analysis to…that of topical contrivance: of interest to geographers but with limited reach beyond’ (Hansen and Coenen, 2015, 105; see also Schwanen, 2018; Yeung, 2019). Therefore, the key challenge is to generalise, which we define as the process in which scholars identify the part of the research findings that have trans-contextual relevance. In this context, others have used the term ‘de-contextualize’ (Bathelt and Glückler, 2003; Bathelt et al., 2017; Hassink, 2019), but since that usually means extending claims into contexts where they are not valid, we prefer ‘generalise’. Because of the emphasis on context and the aim to generalise the parts of result that have trans-contextual relevance, developing of middle-range theories seems to be an appropriate way of theorising in economic geography (Yeung, 2019). According to Merton and Merton (1968, 39), middle-range theories are namely ‘theories that lie between the minor but necessary working hypotheses that evolve in abundance during day-to-day research and the all-inclusive systematic efforts to develop a unified theory that will explain all the observed uniformities of social behaviour, social organisation, and social change’.

This article aims at investigating the role of context in theory development in economic geography. We argue that context sensitivity
is crucial for advancing theory in economic geography. The sub-discipline, in fact, has clear comparative advantages in theorising, but also ‘re-theorising’; that is, revising theories after applying them in a particular context, from a context-specific perspective. However, the pursuit of a certain degree of generalisability and the way to achieve it is often not explicitly discussed. We therefore depart from a critical realist perspective, as it aptly takes both context and particularity, as well as fundamental causal mechanisms (with trans-contextual relevance) into account (for elaboration, see Theorizing and context section). Our main argument is illustrated by examining two instances of the development processes of key concepts in current economic geography, namely ‘related variety’ and ‘knowledge bases’. Related variety was initially developed based on empirical evidence in the Netherlands (Frenken et al., 2007) and then quickly diffused to other countries and contexts (Content and Frenken, 2016). The knowledge bases concept, on the other hand, was first developed in Sweden, and then diffused to other European countries (Asheim, 2007; Asheim et al., 2017). Although these two concepts were developed and applied during the same period (from the early 2000s to mid-2000s onwards), they developed differently in their inference logics, their concern with causality and their sensitivity to differentiated local contexts. As we will show in the rest of the article, related variety has been criticised for its lacking concern with context and contingent conditions, especially when applied in economic-geographic empirical research (Bathelt et al., 2017), and can therefore be regarded from a critical realistic perspective as an example of a bad theorising practice. Knowledge bases, on the other hand, have been praised in this regard (Boschma, 2018) and can hence be seen as an example of a relatively good practice in theorising. The critical analysis of the conceptual development processes of the two concepts should create awareness and sensitivity about context and contingent conditions in economic-geographic theorising and re-theorising, leading to re-thinking context and contingency and contributing to sound and robust theorising.

The article is structured as follows. In the Theorizing and context section, the general literature on theorising is reviewed with a focus on critical realism and the more general social science literature on the role of context in theory development. The Related variety and Knowledge bases sections critically trace the conceptual development processes of the two key concepts, related variety and knowledge bases, within economic geography from a critical realist perspective. The Discussion and conclusion section will discuss context in economic-geographic (re)theorising and conclude.

Theorizing and context

Critical realism as the philosophy of science for economic geography

Critical realism is an appropriate philosophy of science for economic geography—a context-sensitive sub-discipline (Sayer, 1992; Yeung, 1997, 2019; Rutten, 2020). It is a philosophy that focuses on the identification of causal mechanisms. Andrew Sayer, a key critical realist in human geography, raised the fundamental question, ‘how far, or at what depth, are social structures and processes context-dependent?...', a question that is strongly related to the ‘old debate between contextualising and law-seeking approaches’ (Sayer, 1989, 255). Sunley (1996, 339) proposes that critical realism aptly deals with this fundamental question. According to him, ‘Answers to this question have ranged between two contrasting positions: one where context exerts only a minor influence and one in which context is so deep that abstraction is meaningless’. Sayer, in Sunley’s words, ‘...advocated a critical realism which attempts to delimit a middle position where causal structures unfold under contingent conditions’ (Sunley, 1996, 339).
Critical realism underpins the work of many human and economic geographers, either explicitly or implicitly (Cox, 2014, 2020). Critical realists combine a realist ontology with a realistic epistemology (Yeung, 1997). In a nutshell, critical realism ‘…celebrates the existence of reality independent of human consciousness (realist ontology), ascribes causal powers to human reasons and social structures (realist ontology), rejects relativism in social and scientific discourses (realist epistemology) and reorients the social sciences towards its emancipatory goals (realist epistemology)’ (Yeung, 1997, 52). For critical realists, the identification of causal mechanisms is the core of social analysis. A causal mechanism ‘…serves as a necessary relation to connect an initial causal condition with its particular socio-spatial outcomes in context’ (Yeung, 2019, 226). In this regard, demi-regularities stand out as a key concept for critical realists. According to Lawson (1997, 204), a demi-regularity is a partial event regularity which ‘prima facie indicates the occasional, but less than universal, actualisation of a mechanism or tendency, over a definite region of time-space’. Lawson argued that human choice or agency manifests in a semi-, instead of fully predictable manner because variations in patterns of behaviour can be attributed partly to contextual differences. But where demi-regularities are observed there is evidence of relatively enduring and identifiable tendencies, namely, stable structural forces, at play (Jagosh et al., 2012).

Concerning methodologies, critical realists are in favour of ‘retroduction’ (Sayer, 1992; Yeung, 1997). Retroduction is a process that ‘moves from a description of some phenomenon to a description of something which produces it or is a condition for it’ (Bhaskar, 1989a, 19). Retrospective analyses thus proceed through a reflexive and iterative dialogue between theoretical interpretations of the mechanisms constituting or driving phenomena of interest and scholars’ empirical observations of them. Retroduction is open to both qualitative and quantitative techniques. As Yeung (1997) and Sorrell (2018) argue, although mixed methods are often encouraged by critical realists, the precise ways in which different methodological guidelines are employed in different research processes are dependent upon different research topics and contexts. Qualitative methods, according to Yeung (1997), are necessary if one is to abstract the causal mechanisms to which quantitative/statistical methods are oblivious (for a similar argument see Rutten, 2020). Quantitative methods, on the other hand, are more useful in establishing (empirical) regularities between objects, though these concrete regularities are often not causal relations (for a similar observation, see Sayer, 1982, 1992).

In the next subsections, we will show how such a critical realist perspective could help inform the process of theorising in economic geography.

**Process of theorising**

From a critical realist perspective, an appropriate approach to theorising begins with the identification of a phenomenon that may be explained or conceptualised through a theoretical framework that is of interest to the researcher (that is, theory-laden social observation). After that, in the theory development stage, it proceeds by scholars’ effort to gathering data for desired techniques, as well as identifying a particular pattern or set of patterns that seems to constitute, influence, manifest and drive the phenomenon in question (Jones and Murphy, 2011). In this period, empirical research can be used to construct a more context-specific or process-sensitive concept or theory. With this pattern or set of patterns identified, researchers who have themselves developed the theory or concept, as well as other scholars who are interested in it, can test it against facts in other contexts and under different conditions, and hence revise the theory where necessary (that is, the
re-theorising stage) (Figure 1). In the further course of this section, we will show how context plays out in the various stages of theorising.

Theory-laden social observation

In context-sensitive (sub)disciplines, such as in economic geography, the starting point of theorising is social observation (Jones and Murphy, 2011). Information can come from place-based observed phenomena, problems, interviews, archives, newspapers, data sets etc. While such social observation is essential for creative theorising, from a critical realist perspective, it is, however, neither theory-neutral (that is, observations are untainted by concepts or theories) nor theory-determined (that is, observations are completely determined by pre-existing theories). Rather, it is theory-laden. In other words, observations are not made in a vacuum but are guided and shaped by prior questions, problems, hypotheses, conjectures or theories (Sayer, 1992). Therefore, researchers observe through the theoretical lenses of the training they went through, the theories they are aware of, and the socio-cultural environment they were brought up in. According to Sayer (1982, 72) ‘…while theoretical introspection can work upon already established conceptualizations of necessary relations, …[empirical observations] must use concepts to check the adequacy of these and add information about external relations which are not knowable in advance…’.

Theory development: theory as conceptualisation

Once the stage of social observation is over, one confronts the empirical material with a view to theorising it. The process of theorising usually involves naming, the creation of new concepts, typologies and, at times also metaphors, analogies etc. (Swedberg, 2014). In this regard, Sayer (1982) differentiates two distinct understandings of a theory: that is, theory as an ‘ordering-framework’, which permits observational data to be used for predicting and explaining

Figure 1. Process of theorising.
Source: Own elaboration.
empirical events; and theory as ‘conceptualisation’, in which ‘to theorize’ means to prescribe a particular way of conceptualising something (Sayer, 1982, 50). Mainstream theorising tends to draw on what Sayer (1992, 71) calls ‘chaotic conceptions’ and to favour ordering framework approaches to theory. ‘Chaotic conceptions’ are the ones based on classifications of attributes, treating the observations as qualitatively equivalent; they abstract on the basis of formal characteristics. Such approaches, ‘…do not value or even reject altogether case-study research highlighting local specificity’, and they even do not ‘…require differences between regions to exist, be it differences in factor prices or institutional set-ups’ (Boschma and Frenken, 2006, 277). Critical realists argue that theory as an ordering framework model is mostly misleading because it merely orders ‘data’ like a filing system, but does not make claims about the nature of the world. Hence the idea of theory as ‘an examined conceptualisation of some object’ (Sayer, 1982, 51), or what Sayer (1992, 71) describes as ‘rational abstractions’, is favoured. Rational abstractions abstract on the basis of the substantive connections of objects. They often pay high attention to local context and local specificity (Kennedy and Thornberg, 2018). Differences between contexts are therefore often the starting point of analysis. From a critical realist viewpoint, chaotic conceptions are not merely problematic in their main inference logic and methodology (deductive formal modelling, statistical calculation, see Sayer, 1992), more importantly, as we will show below, they seem to be incompatible with critical realists’ key concern about causal mechanisms and necessary/contingent relations.

Whichever theorising approaches researchers are taking, the overall aim is to develop a theory that has generalisability (universality) beyond the original context (particularity)—the theory needs to be generalisable to a certain degree, either statistically or analytically (Schofield, 2002) from the selected sample populations or study cases. How is generalisability achieved then? Critical realists differentiate between two approaches in this regard: namely, through generalisation and through abstraction (Sayer, 1982, 1992).

An (empirical) generalisation is a quantitative measure of the number of objects belonging to some class or a statement about certain common properties of objects (Sayer, 1992, 100). Generalisations here can be understood as either simple descriptive summaries of a given situation or extrapolations—rough predictions of what other situations might be like (Sayer, 1992, 100). For those who are behind chaotic conceptions, empirical generalisation plays a more prominent role than abstraction. It is assumed that theorising is supposed to seek out generalisations of relations among empirical objects and events and not abstractions of what produces them. However, as Yeung (1997) has rightly posited, these statistical or empirical generalisations are only generalisable at a specific temporal-spatial intersection. A serious problem of reductionism can be expected if one mistakenly treats these contingent generalisations (that is, empirical regularities) as necessary causal mechanisms. In order to identify the true causal mechanisms and hence the trans-contextual parts of a theory, critical realists suggest that abstractions might be more appropriate.

Critical realism postulates that there are deep, necessary ontological structures behind the surface of facts and events, which cannot be directly seen or experienced (Sayer, 1992). These ontological structures are strongly associated with causal powers. Abstraction, therefore, is the process needed to discover these deep ontological structures and related causal powers. It is the ‘…scrapping away surface cover that hid the pure (real) ontological structure beneath’ (Barnes and Christophers, 2018, 147–148). However, these causal powers do not work automatically (if A happens, then B will happen), but depend on contingent circumstances. Moreover, not only do these powers work under contingent circumstances,
the resulting effects of these powers are ‘... also contingent, depending on the specific contextual setting in which the cause was realized’ (Barnes and Christophers, 2018, 148). Abstraction, therefore, is understood as the way to tease out the (necessary) causal mechanisms and structures which are realized under specific (contingent) conditions (Yeung, 1997). So explanation in economic geography is only possible if abstraction is ‘... completed, the ontological structure revealed, and necessary and contingent relations delineated...’ (Barnes and Christophers 2018, 148). The resulting concept or theory is then again examined ‘...in the contingent circumstances of specific places’, which often produce ‘...wrenching effects’ (Barnes and Christophers, 2018, 148).

Theory application and/or re-theorising

After a new theory is developed, the theory developer(s) and other scholars can test it against observations in various contexts. By applying the newly developed theory in different contexts, a new round of theorising (or re-theorising) starts. During such a re-theorising stage, scholars can either work with theories and concepts developed within economic geography, and thus follow a social-observation/theory development/theory application sequence, or they can feed back to theories and concepts that are imported from other disciplines by carrying out empirical work that takes regional preconditions, local context and contingencies seriously into account. However, demarcation lines between the influence of imported versus theories indigenous to economic geography are relatively fluid and hence are not very clear at times.

So far, the term re-theorising is only used in economic geography to indicate a change in different kind of theorising altogether, as in Barnes (2001), where he described the shift of epistemological to hermeneutic theorising accompanying the shift from the quantitative revolution to the cultural turn in Anglo-American economic geography. However, in our view, as stated above, re-theorising refers to the revising and reconfiguring of existing theories and concepts, no matter whether they are imported or indigenously developed. This revising or reconfiguring is often carried out because of empirical, context-sensitive research results showing unpredicted outcomes that go beyond the explanatory power of the original theory. In a way, ‘good’ theory should best be seen as critique (Barnes and Christophers, 2018), and the history of theory is essentially a history of critique—a never-ending ‘...process of rigorous conceptualisation, itself drawing on and [questioning and reformulating] previously achieved understandings of the phenomena in question’ (Massey 1995, 304, cited in Barnes and Christophers, 2018).

As mentioned earlier, economic geographers work intensively in re-theorising concepts and theories. Although it goes beyond the scope of this article to give a full overview of re-theorising in economic geography, the following examples are particularly revealing in our view. The lock-in concept, for example, has been imported from elsewhere and reworked in a context-sensitive way to answer economic geography questions. Stemming from evolutionary economics and referring to the evolution of competing technologies, Grabher (1993) introduced it into economic geography by intensively applying it in his empirical study on the industrial restructuring of the Ruhr Area. Based on that context-sensitive empirical study, he revised and reconfigured it into a concept useful for understanding and explaining differences in industrial restructuring in old industrial areas, by differentiating between functional, cognitive and political sorts of lock-in.

Strategic coupling, on the other hand, is a good example of re-theorising theories and concepts developed within economic geography. The concept originated in the Manchester School of economic geography in tandem with global production networks, in order to understand and explain the interrelations between
transnational corporations and regional policymakers, and the development and adaptation of regional assets to the needs of corporations and their global production networks (Coe et al., 2004). Based mainly on an overview of context-sensitive empirical work in the UK (North East of England and Wales), MacKinnon (2012) found more tension and inequality in the relationships than was conceptualised in the original version of the idea and hence reworked it into new variants, such as decoupling and recoupling.

In contrast to these two positive examples of re-theorising in economic geography, there are many other theories and concepts where the process has been less successful. The theory of co-evolution originated outside economic geography. It recently received more theoretical attention there (Gong and Hassink, 2019), but still lacks enough context-sensitive empirical research to adapt it well and convincingly to questions in economic geography.

So although economic geographers highlight different aspects of context, as has been pointed out in the introduction, what they share is a sensitivity to the role of space, places and scales in leading to distinct developmental outcomes (Martin, 2000; Barnes and Sheppard, 2010). Such a sensitivity to local heterogeneity and idiosyncracy could contribute to theorising and re-theorising by identifying something interesting/exotic, something problematic, and something surprising (Yeung and Lin, 2003; Hansen and Coenen, 2015). Economic geography, as an importer of theories and concepts from neighbouring disciplines, but also as a locus of original theory development (Barnes and Christophers, 2018), has much to contribute to such re-theorising processes. It is fair to argue that in fact economic geographers are mostly engaged in re-theorising, that is working with existing theories, and trying to improve them by taking space, places and scales seriously into account. It is exactly in this process that we see much added value of economic-geographic research. To put it simply, we argue that due to the context-sensitive nature of the sub-discipline, economic geographers are, in principle, in a very good position to feed back, improve, revise and even substantially alter the existing theories that they import from other disciplines. However, this does not automatically guarantee that economic geographers are doing equally well in different sorts of (re) theorising work, when taking into account specific contexts. As will be shown in the Related variety and Knowledge bases sections, where we examine the theorising processes of these two key concepts in economic geography from a critical realist perspective, economic geographers are doing well in certain aspects, while they are doing relatively poorly in others.

**Related variety**

Related variety is a concept that explains knowledge spillovers and employment growth in regions by emphasising the relatedness between industries. It is part of a broader set of key contributions of evolutionary economic geography regarding the relationship between specialisation vs. diversification and regional economic growth (Frenken et al., 2007; Boschma, 2017). In a recent overview article, Content and Frenken (2016) summarised nicely the intellectual trajectories that scholars working on this topic have gone through in the last decade or so. In the launching article by Frenken et al. (2007, 688), the authors put forward a hypothesis that ‘…one expects knowledge spillovers within the region to occur primarily among related sectors, and only to a limited extent among unrelated sectors.’ Their study on related variety in the Netherlands showed that between 1996 and 2002, it led to increased employment growth. Inspired by this seminal work, as well as the work on ‘product space’ by Hidalgo et al. (2007), an increasing number of researchers in economic geography have made substantial efforts to contribute to this emerging topic. As a result, a large number of empirical studies have been produced on
the effect of related variety on national and regional economic development.

The main article (Frenken et al., 2007) was based on a research report commissioned by the Dutch Ministry of Economic Affairs (Frenken et al., 2004), as well as on earlier work by Frenken et al. (1999). The concept was first introduced as an attempt to resolve an earlier question on whether regions benefit most from being specialised or being diversified (Glaeser et al., 1992). In this sense, the related variety concept was developed in a theory-laden way, and primarily, it was inspired by the prior ‘MAR versus Jacobs’, or ‘specialisation versus diversification’ discussion (Content and Frenken, 2016).

Concerning the disciplinary positioning of the formulation, Frenken et al. (2007) did not refer to economic geography in their launching article, but instead only referred to economics and business economics, whereas in their recent review article on related variety, Content and Frenken (2016) start by referring to research in economic geography. In the first sentence of their paper, they state: ‘In recent research in economic geography, an empirical body of literature has emerged on the role of related variety in regional development’ (Content and Frenken, 2016, 2097). So apparently, this concept was not developed in economic geography but turned out to be applied by many economic geographers, particularly those within the paradigm of evolutionary economic geography.

In theory development, Frenken et al. (2007) followed a ‘theory as an ordering framework’ kind of conception, and thus theorised deductively, which becomes particularly clear concerning the context-neutrality shown in the launching paper, in which only minimal attention was paid to the Dutch context. There might have been institutional and/or socio-cultural factors affecting the results, but probably because of the key authors’ training background as economists, these context specificities somehow tended to have been marginalised.

What is in our view problematic, however, is that most of the empirical work on related/unrelated variety in economic geography that has followed Frenken et al.’s (2007) seminal work remained insensitive to, and hence exclusive of, local institutional, cultural contexts, leading to failures in advancing related variety from empirical regularities to causal mechanisms. In a critical vein, Bathelt et al. (2017, 930) observe concerning the studies on related variety: ‘many such analyses [on related variety] focus on identifying those variables that stimulate, for example, economic growth and innovation, but are less interested in investigating the specific institutional conditions under which these relationships function or fail’ (Bathelt et al., 2017, 930). Similarly, Boschma (2017, 357) is recently urging more geographical wisdom in studying relatedness and is also in favour of leaving ‘… behind the acontextual view of relatedness in many studies’, including studies he has been involved in himself. He also criticises the ‘…the treatment of relatedness as a global and universal phenomenon that connects the same activities irrespective of their location worldwide’ (Boschma, 2017, 360).

Sayer (1992) has summarised the potential reason why local contexts are ignored in such formal modelling. According to him, the operation of quantifying can only be developed for objects and processes which are qualitatively invariant. However, such qualitative invariance turns out to be less common in social science than in natural science. As a result, ‘context-dependent actions or properties… might therefore be considered unsuitable for quantification’ (Sayer, 1992, 177). This counts for context-specific factors such as institutions, or cultures, that have been highlighted by economic geographers. As is clearly shown in most of the applications of the related variety concept in different countries or regions, such as Boschma and Iammarino (2009) in Italy and Boschma et al. (2012) on Spanish regions, neither the context in the original study nor the
context in the country or regions of application were dealt with in much detail. In the overview paper by Content and Frenken (2016), they acknowledge the different locations of the studies carried out so far. However, instead of paying attention to, and reflecting on, the geographical and institutional context of the different studies, they are mainly interested in the results (confirmation of hypothesis) and the methods used and how to optimise them. Methods are surely important, but their importance cannot be asserted unless they are supported by strong philosophical claims at the ontological and epistemological levels (Yeung, 1997). Related variety offers easily accessible and ‘objective’ methods (quantification and statistical methods) without resolving some fundamental philosophical problems embedded in human empiricism and logical positivism (Bhaskar, 1989b, cited in Yeung, 1997).

Scholars investigating this concept, of course, aim for its empirical generalisability. As many later empirical investigations on the role of related variety on regional diversification have confirmed, related variety is argued to be ‘the rule’ of regional diversification in different regions or countries (Boschma, 2017). However, as Content and Frenken (2016, 2109) themselves have admitted, ‘...the mechanism (of) “how” related variety leads to growth and export specialisations remains rather implicit’.

From a critical realist perspective, related variety seems to aim for identifying the empirical regularities, that is, an empirical generalisation, between objects. As Yeung (1997) argues, it should not be expected that these abstract empirical regularities can explain events directly without any need for empirical research into the contingency of the concrete. In other words, related variety scholars have yet to identify the fundamental structures and mechanisms that contribute to divergent regional economic development. Of course, the identification of such empirical regularities could potentially inform the abstraction of the causal mechanisms from the differentiated regional economic development phenomena, but such processes, according to critical realists, have to be realized through the usage of more inductive, qualitative methods (Rutten, 2019). In other words, the empirical regularities identified by evolutionary scholars have to be confronted with distinct local contexts and particularities in order to be able to identify the fundamental causal mechanisms.

In a way, related variety can be seen as an example of an acontextual concept in economic geography—a context-sensitive sub-discipline. Although economic geographers have quickly adopted this idea in their empirical work, they actually did not contribute much to the conceptual advancement of related variety (re-theorising), as might have occurred by adopting a critical realist perspective. They have namely failed to identify the causal mechanism (that is, the necessary relations) of divergent regional economic development on the one hand and to take into account the place-specific context and contingent relations (reflecting upon the role of local institutions, cultures and networks in contributing to the understanding of territory-specific nature of relatedness) on the other.

**Knowledge bases**

Knowledge bases in economic geography is a concept aiming at understanding crucial differences in knowledge formation and exchange, and related innovation and learning processes and competitiveness between various industries, and in a regional context. It was first developed by the Swedish industrial economist Laestadius (1998) and then introduced into economic geography by Asheim and Mariussen (2003), Mariussen and Asheim (2003) and by Asheim and Gertler (2005). The approach has its roots in the Innovation Studies literature. The interest of the originators of the concept and their attempt to transcend the conventional
dichotomies of high-tech versus low-tech knowledge, tacit versus codified knowledge, and Science-Technology-Innovation versus Doing, Using, and Interacting knowledge (Boschma, 2018) can be regarded as the starting point of such a theorising process.

In terms of theory development, the knowledge base concept was developed in a context-sensitive, inductive way, based on comparative case studies mainly in the Nordic countries. However, in the last decade or so, the idea has also been increasingly applied to the analysis of knowledge-related networks and activities in other countries, such as Germany (Plum and Hassink, 2011), and some emerging/developing countries (Chaminade, 2011). The educational and training background of Bjørn Asheim, supervised by Torsten Hägerstrand, one of the founding fathers of contextualisation in human geography, certainly influenced his approach (Hägerstrand, 1974; Asheim, 2006, 2020). A group of scholars working on Regional Innovation Systems (Asheim and his colleagues at Lund University) then developed the concept further by a process of abstraction and generalisation of the empirical observations. Specifically, the key authors distinguished between three types of knowledge base: the analytical (science based), the synthetic (engineering based) and the symbolic (creativity based) (Asheim and Coenen, 2005; Asheim and Gertler, 2005). Each implies particular combinations of tacit and codified knowledge, different knowledge exchange partners and knowledge sources, various types of innovation, and different spatial dimensions of knowledge transfer relations.

In recent years, the earlier empirical work on knowledge bases (diversified knowledge base 1.0 or DKB 1.0 literature according to Boschma, 2018) has been criticised by scholars as being static, simplistic and non-explanatory (for a detailed critique, see Boschma, 2018). In reaction to aspects of this criticism, scholars have increasingly taken a dynamic and combinatorial approach (Asheim et al., 2011, 2017; Manniche, 2012; Manniche et al., 2017). Boschma (2018) terms this emerging strand of literature as ‘differentiated knowledge bases 2.0’ or DKB 2.0. DKB 2.0 aims to improve the original arguments by deepening the analysis in the following respects. First of all, it suggests a combinatorial approach, combining different knowledge bases instead of strictly separating them, as well as incorporating evolutionary concepts like variety and relatedness (Grillitsch et al., 2017). Second, it focuses on the dynamic processes of change and transformation by investigating individual innovation projects (Strambach and Klement, 2012; Manniche et al., 2017) or by analysing the shifts of dominant knowledge bases from a cluster life cycle perspective (Ingstrup et al., 2017). The movement from DKB 1.0 to DKB 2.0 can be seen as evidence of relatively successful re-theorising within economic geography, characterised by various scholarly empirical work based on different regional contexts, and their feedback to and improvement of the original DKB 1.0 conceptualisation.

In strong contrast to related variety, which remains insensitive to local context and contingencies, and through its conceptual development process, several claims with a strong geographical and contextual content have been added to the knowledge bases concept (Boschma, 2018). First, it has been claimed that there is a link between knowledge bases and different types of regional innovation systems (Asheim and Coenen, 2005; Asheim, 2007). Second, it is argued that geographical proximity and context matter for different kinds of knowledge base. Third, it has been claimed that institutional structures, such as national and regional innovation systems, and varieties of capitalism, play a role for different knowledge bases. Fourth, the nature of regional innovation policy has been linked to their variation (Hassink et al., 2014b; Martin and Trippl, 2014).

Whereas related variety aims for statistical generalisability, the knowledge bases concept
seems to aim for analytical generalisability (Yin, 2018). The differentiated knowledge bases—measured either by professions (Asheim and Hansen, 2009), or industries (Martin, 2012) or regions (Asheim and Coenen, 2005)—and their combinations have been argued to be the fundamental mechanisms leading to divergent processes of learning and innovation between industries observed in regions (Boschma, 2018).

In a way, knowledge bases, arguably an imported concept, is continuously elaborated to accommodate evidence from case studies embedded in different regions and countries, and hence is ready to capture changes in the specific contexts (that is, the contingent conditions) and feed back to the original concept (that is, re-theorise) in a contextually informed manner. In consequence, the progress made by economic geographers on it can be interpreted as an example of a context-sensitive theorising process. Particularly, in recent work on DKB 2.0, in which scholars proposed to use mixed methods in capturing the combinatorial and evolutionary nature of the knowledge bases underlying certain industries or within certain regions (Asheim et al., 2017; Boschma, 2018), we see prospects for economic geographers to further develop this concept from a critical realist standpoint.

**Discussion and conclusion**

By critically reviewing the conceptual development processes of two key concepts from a critical realist perspective—related variety and knowledge bases—it is clear that the two concepts are both influenced by neighbouring disciplines—evolutionary economics for related variety and industrial economics/innovation studies for knowledge base. Their developments both followed the social observation => theory development (narrowly defined) => re-theorizing (theory/concept application) process. During the whole theorising process, the topics of interest were approached and theorised differently by scholars with different educational and training backgrounds. Arguably, related variety is a typical example of an evolutionary economic geography concept strongly embedded in evolutionary economics—it is based on measurable indicators and variables, aiming at identifying empirical regularities rather than causal mechanisms. Knowledge bases, on the other hand, seems to be a typical example of a concept developed with substantial attention being paid to the role of local context in furthering improving the concept.

In terms of how concepts are applied in different regions or countries, (re-theorising process) and from a critical realist perspective, the related variety and knowledge bases studies are very distinct concerning their sensitivity to local context and contingencies, and hence their capacities in feeding back to and improving the original concepts. Although the notion of related variety has been taken up quickly, in much of the empirical work in evolutionary economic geography, scholars somehow did not manage to incorporate the contextual factors and particularities (institutions, cultures etc.) in their work, which has led to a lack of proper understanding of related variety. The lack of attention paid to context, in turn, might be partly caused by the inherent limitations of quantification, and partly by scholars’ strong concern with epistemology rather than ontology (Boschma, 2017). Thus Bjørn Asheim (6 September 2019) in a personal email correspondence with one of the authors, writes: ‘In all their differences, evolutionary and mainstream economics share one common feature, that both of these approaches do not rest on a social ontology. Evolutionary approaches are basically science approaches, which by definition do not have a social ontology. This is why it remains so difficult for evolutionary economics/EEG to integrate actors, agency and institutions in their framework. In spite of all the great efforts of Ron Boschma and others,
it remains “adds-on” (for a similar observation, see Rutten, 2019). From a critical realist viewpoint, such a lack of ontological consideration is particularly problematic because it can easily lead to ‘epistemic fallacy’ by conflating ontology with epistemology (Bhaskar, 2013). Without differentiating between the two, related variety studies bear the risk of saying little more than the ‘quantitative fit’ of the model (Sayer, 1992). And they also seem to be particularly vulnerable to so-called ‘spurious correlations’ (Rutten, 2019), in which two or more variables are associated but turn out to be not causally related. They hence failed to advance the concept from empirical regularities to causal mechanisms.

In contrast, with regard to the other concept reviewed in this article—knowledge bases—scholarly work in economic geography, from the outset, has been sensitive to local contingencies and place-specific conditions (for example, links between knowledge bases and different types of regional innovation systems, geographical proximity, institutional structures, regional innovation policy) in understanding different types of knowledge base activities. The continuous consideration of context-sensitive findings from case studies embedded in different regions/countries, as well as authors’ recent proposals to use mixed methods in capturing the combinatorial and evolutionary character of the differentiated knowledge bases, have shown potential for economic geographers to theorize and improve this concept further.

In more general terms, although scholars in economic geography have attributed high value to theories explaining uneven geographical phenomena, in our view, much less insight has been generated on how to theorize properly in the extant literature. We argue that economic geography, as a context-sensitive field, is suitable for developing/redeveloping middle-range theories for causal explanations (Yeung, 2019). Critical realism as a philosophy of science that attaches great value to both necessary and contingent relations is therefore an appropriate philosophical approach to guide scholars through the various stages of theorising in the sub-discipline. By drawing insights from critical realism and the broader social sciences on how to theorize, this article contributes to the understanding of theorising and re-theorising in economic geography by taking into account the role of context throughout the whole process of theorising (social observation, theory development and theory application/re-theorising). More specifically, we argue that due to the context-sensitive nature of the sub-discipline, economic geographers are, in principle, in a very good position to feed back, improve, revise and even substantially alter the existing theories. The particular strength of economic geography with regard to advancing theory lies in the continuous application of concepts and theories (that is, generalities) within new contexts (that is, confrontation with new particularities). However, this does not automatically guarantee that economic geographers are doing equally well in (re)theorising, by taking into account specific contexts. Our analysis of related variety and knowledge bases from a critical realist perspective shows that the former can be regarded as bad practice and the latter as relatively good practice of context-sensitive theory development.

Overall, we argue for more careful and reflective theorising and re-theorising in economic geography, paying more attention to context. As expressed in the first sentence of this article, economic geography is essentially about describing, analysing and explaining economic activities in real places. Context therefore matters, but in order to analyse and explain we need to abstract from contingent conditions, so that causal powers and mechanisms become clearer. Furthermore, in order to do economic geography properly, we need conceptual clarity, as well as a clearer distinction between different stages of theorising, without denying that theorising often occurs in an iterative manner.
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