INTRODUCTION TO THE SPECIAL ISSUE: GLOBALISATION, KNOWLEDGE AND INSTITUTIONAL CHANGE: TOWARDS AN EVOLUTIONARY PERSPECTIVE TO ECONOMIC DEVELOPMENT

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ABSTRACT

This special issue aims at advancing the debate about the interpretative power of evolutionary perspectives on economic development and institutional change. In the introduction, we argue that the interpretative power of the current evolutionary approach can be improved by elaborating an 'augmented' perspective to economic development, which explicitly integrates the role of institutions and the dynamics of natural resource sectors (e.g. agro-food) into the analysis. We maintain that such a theoretical and empirical advancement can help to define a conceptual framework that is more suitable to analyse innovation-driven change, differentiated development patterns, opportunities and constraints for developing countries in the globalised knowledge economy. A collection of papers that adopt this perspective are discussed in order to prove the interpretative power of this approach in a variety of development contexts.

Key words: Evolutionary economics, evolutionary economic geography, economic development, globalisation, institutional change

INTRODUCTION

Globalisation and knowledge are unanimously regarded as the defining characters of contemporary economies. Welfare of countries, regions and individuals stem from their ability to generate relevant knowledge, participate into global markets and continuously evolve to take advantage of emerging opportunities and respond to societal challenges. However, the ability of economic systems to upgrade and fully participate of the opportunities brought about by the globalised knowledge economy crucially depends on their access to resources, assets and talents and on the emergence of appropriate institutional settings. In order to cope with these challenges and sustain social and economic development, private and public economic actors require, among other things, an innovative aptitude, which means that they need to be able to foresee, adapt and shape changes brought about by globalisation. The implementation and sustainability over time of these processes present peculiar challenges or

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difficulties, especially for less developed countries. In this sense, globalisation also involves uncertainties and threats, which can generate strains and slow down the process of learning and catch up. These negative effects can be significant, especially, though not exclusively, in backward economies, characterised by structural deficiencies and imbalances, as well as in emerging economies, which might suffer from extreme competition or costly access to external resources.

The key question then is how to participate in the knowledge-driven dynamics and accrue the benefits of globalisation so as to favour sustained economic and social upgrading at the local level. What seems to be important in this context is to understand how different institutional models emerge and co-evolve with technologies in the new economic and social environment, shaped by dynamic globalisation forces, and how local agencies participate to these processes. The inherent circularity between institutions and development represents a key mechanism to be taken into account when analysing the opportunities and challenges the knowledge-driven globalisation poses to developing economies.

This special issue presents contributions which address this crucial question from an evolutionary perspective. These contributions share the view that evolutionary theorising (Dosi *et al.* 1988; Hodgson 2004; Metcalfe & Foster 2004; Nelson & Winter 1982) provides a suitable framework to interpret innovation-driven change and understand the variety of development patterns in the globalised knowledge economy. We argue that the evolutionary perspective can contribute to addressing key research questions in the development area, by purposefully moving the discourse away from economic growth, defined simply by the scale and rate of change. Instead, it can shift analytical and policy attention to multi-dimensional patterns of evolution and to the alternative directions for economic, technological and associated institutional change (Hidalgo *et al.* 2007; Stirling 2009)

However, we also contend that there are limitations in the approaches that so far evolutionary economic scholars have adopted to interpret the development discourse (Fagerberg 1994; Perez & Soete 1988; Nelson 2008b; Niosi 2008; Lundvall *et al.* 2009). These limitations emerge in particular with regards to the conceptualisation of institutions, the analysis of system emergency in developing contexts, the investigation of sectoral specificities, the understanding of how global dynamics intersect and interact with national and local environments, and, more broadly, the inclusion in the analysis of research questions posed by the broad family of development studies (Casson *et al.* 2009). We maintain that an evolutionary approach to economic development should explicitly integrate institutions into its research agenda, with an emphasis on the dynamics and interplay of global and local institutions. This would be especially relevant for evolutionary approaches to economic geography that have so far paid little attention to the role and dynamics of institutions.[1] Furthermore, empirical studies should pay more attention to the natural resource sector, which often plays a crucial role in the development pattern of emerging economies, and, as such, is the object of thorough investigation in development studies, but has been often disregarded by evolutionary investigation. The full integration of these issues in the research agenda would allow evolutionary scholars to address key questions concerning the opportunities and challenges that globalisation poses to emerging and developing economies. In what follows, by discussing the content of the articles included in this special issue, we suggest key directions for an 'augmented evolutionary perspective' to economic development. In the last section we draw some conclusions.

AN AUGMENTED EVOLUTIONARY PERSPECTIVE TO ECONOMIC DEVELOPMENT

The structural changes and the catching up trajectories of emerging economies have attracted increasing attention from evolutionary scholars, who have explored the relationship between macro growth dynamics and micro properties and behavioural heterogeneity, mainly focusing on the creation of technological capabilities at the firm level and on the systems in which innovative heterogeneous actors are embedded, at the national, regional or sectoral level (e.g. Nelson & Winter 1982;

Dosi *et al.* 1988; Freeman & Louça 2001). Innovation system approaches (Nelson 1993; Lundvall 1992; Edquist 1997; Malerba 2004) are a case in point in this research agenda. These mainly empirics-led contributions, in fact, define an analytical framework that builds on evolutionary theories of economic change, offering a rich narrative of the mechanisms, actors and networks that ignite and sustain innovation and knowledge dynamics. This system perspective has been increasingly adopted and adapted to investigate broad development dynamics in a global setting (e.g. Lall 1992; Chaminade & Vang 2008; Niosi 2008; Lundvall *et al.* 2009; Malerba & Mani 2009), the emergent diverse institutional models and innovation strategies of latecomers in dynamic knowledge-intensive industries (Lee & Kim 2008; Amsden & Chu 2003; Cusmano *et al.* 2010) and the challenges of 'building an effective innovation system for catch up' (Malerba & Nelson 2011).

The core of evolutionary theorising in economics and economic geography is technological learning and the 'qualitative' changes that drive and, at the same time, are brought about by economic development (Nelson & Winter 1982; Dosi *et al.* 1988; Boschma & Frenken, 2006). In this, the evolutionary approaches build on the legacy of Schumpeter (1911, 1942), who explained the endogenous character of technology and its role in contributing to economic development (Rosenberg 2000). In the evolutionary field, prominent attention is given to the idea of transformation as flux, of growth as development, of modern capitalism as a system which tends to continuously redefine itself from within (Metcalfe *et al.* 2002).

Differentiated development patterns are interpreted as the result of differences in initial conditions and path/place-dependence, nonlinear dynamics, heterogeneity in capabilities and behaviours at the micro level, which reflect into different emergent properties at the level of the system. Heterogeneity and its dynamics are related to processes of variety generation and selection, which operate mainly at the micro (firm) and meso level (regions) (Nelson & Winter 1982; Metcalfe & Foster 2004), but result in structural changes, as the composition and spatial distribution of economic activities and their patterns of interaction change (Saviotti & Pyka 2004). In this respect, the approach offers a rich conceptual framework for understanding the variety and geography in patterns of development in the knowledge based economy.

The evolutionary approach further acknowledges that transformation of economies involves interaction of the economic sphere with other domains, such as, beside science and technology, institutions (Nelson & Sampat 2001; Fagerberg & Verspagen 2002; Nelson 2002; Boschma & Frenken 2009; MacKinnon *et al.* 2009).

A large wealth of empirical work, which adopts an evolutionary perspective, shows that effective technological advancement and its translation into innovation-driven competitiveness need appropriate institutional structures. Most often, technological change goes together with organisational innovation and institutional renewal (Dosi *et al.* 1994). In the evolutionary discourse, following Schumpeter, innovation often implies a painful process of creative destruction, including institutional substitution or renewal (Nelson 2008a). New sectors, new institutions and technologies emerge out of the disappearance of established economic activity and the disruption of existing social institutions. Path and place-dependent processes drive the emergence of new sectors and shape the evolution of regional economies (Boschma *et al.* 2013).

The dynamics of development often requires that old institutions change and new ones emerge, as key technologies of different eras demand different sets of enabling institutions (Perez & Soete 1988). The comparative investigation of development experiences over the last decades suggests that successful countries and regions are those that have the basis of these enabling institutions in place when they are needed, or which manage to build the appropriate new institutions quickly and well (Freeman & Louça 2001; Nelson 2008a).

The evolutionary perspective on innovation dynamics and institutional renewal is however not exempted from limitations, when applied to the development experience and the challenges, in the knowledge-driven global scenario, of less advanced or emerging areas, as argued by an increasing number of scholars (e.g. Arocena & Sutz 2000; Morrison *et al.* 2008;

Lundvall *et al.* 2009; MacKinnon *et al.* 2009; Stirling 2009). So far, this literature has mainly focused on well-functioning institutional settings, while overlooking the specificities of disarticulated systems, which often prevail in developing countries; when an institutional comparative perspective is adopted, often it leaves dynamics out of the main picture (Boschma & Frenken 2006). In particular, little attention has been paid so far to the social and historical construction of institutions and their evolution over time (MacKinnon *et al.* 2009). Also, in most empirical studies on system building and institutional change, the role of cultural differences, politics, friction and conflict between different players and across governance levels are often overlooked or underestimated (Stirling 2009). Furthermore, the evolutionary field has devoted most attention to so-called high-tech sectors, while the innovative dynamics of traditional sectors is much less investigated, although these sectors, including agriculture, are often relevant to the development strategies of emerging and developing economies.

The contributions presented in this special issue, while adopting an evolutionary approach, also tackle some of the above mentioned weaknesses. In so doing they provide illustration of how, in different areas and development contexts, an 'augmented' evolutionary approach can improve understanding of the actors and mechanisms at play in the global-local dynamics.

IN THIS ISSUE

All the papers in this issue adopt a dynamic approach to innovation, institutions and systems. The longitudinal analysis goes beyond the mere static comparison of different time periods. The authors rather illustrate and give sense of the process behind the emergence of new institutions, routines and technology, and their co-evolution over time, taking into account the interplay of possibly conflicting forces at the local and global level. In this way, the evolutionary dynamics and institutional emergence in a specific sectoral and local context are also explained by, on the one hand, the dynamic interaction of emergent system properties at the local level and, on the other hand, the actors, conditions and constraints that emerge in the global setting.

Iizuka and Katz discuss the relevance for developing economies of the transformation of innovation systems and highlight the importance of understanding how the institutional context to innovation changes overtime. In their study on the Chilean salmon industry, the authors show how a production system and its organisation models that first boomed eventually failed because of the misalignment between social and physical institutions. Specific attention is called upon the emergence of a new set of institutions, which can nurture the collaboration between local producers and other stakeholders in the industry. Following the intervention by different actors and the interplay of various forces, at the local, national and global level, a new institutional model emerged after the crisis of the sector, with the aim to integrate environmental conditions and firms routines.

In their study of high value natural resource activities in Argentina and Chile, Marin and colleagues illustrate the evolution of advanced technologies and market enabling factors, whose development is shaped by changing external and local conditions (e.g. international trade terms, market segmentation). They argue that recent transformations in the local and global contexts, including market and innovation dynamics, open up a new window of opportunity for countries that are rich in natural resources: using natural resource industries as a platform to develop knowledge intensive industries. To take advantage of this opportunity, however, these countries need to develop specific capabilities and design a concerted strategy to improve governance and strengthen institutions, on the basis of broad consensus. However, consensus demands overcoming the traditional view of resource-based sectors and adopting a systemic view of their production and innovation linkages.

The study by Duysters and colleagues on the internationalisation activities by Indian and Chinese companies, mainly through M&As and strategic technology alliances, revisit the debate on the mechanisms of international knowledge transfer and catch up economies. The authors show how globalisation has been changing the channels for knowledge transfer, eventually

leading to the emergence of new actors and strategies, which are more active at the global scale and differ to a large extent in their geographical scope. The study comments on the interplay between macro changes and transformations at the firm level, pointing at the emergence of alternative governance modes by firms in emerging economies, which importantly explain their stronger position in international markets.

Montobbio and colleagues adopt a dynamic quantitative perspective to analyse the role of global institutions (i.e. TRIPS) for innovation in emerging economies and how these institutions impact on their acquisition of international knowledge. The study highlights the importance of economic and institutional determinants to knowledge flows, particularly in the instance of technological collaborations, when tacit knowledge can be exchanged. On the other hand, with regard to the flows of codified knowledge, as tracked by patent citations, the paper shows that the strengthening of specific global institutions, such as those related to intellectual property rights, has not produced a significant direct impact for the knowledge acquisition of emerging economies.

The dynamic approach adopted in the different articles of this Special Issue allows singling out and analysing a number of evolutionary processes, such as variety generation, proximity and selection. Iizuka and Katz show that institutions are structuring forces that result from selective learning and interaction, they are the products of societal self-organising processes and agent-induced actions, including public policy. Their study unveils the individual and collective mechanisms that lead to the generation of new routines and the discarding of old ones in an agro-food sector. This is a process of institutional building, whose success stems from the fitness of social and physical technologies with the broader institutional context of increasingly global agro-business. The variety generation process occurs in a global-local dynamic setting, where we observe the interplay of different actors (public research centres, firms, universities, public agencies), who set out different organisational models (i.e. social technologies, in the words of Nelson, 2008a), and local actors, who define the domestic institutional framework (i.e. national government legislation) and experiment the proposed institutional model (i.e. producers). The selection process is neither entirely top-down nor bottom up. It consists of a social construction process, in which frictions and conflicts between different social groups inevitably emerge. The emergence of the best fit routines is the outcome of continuous experimentation, rather than a static equilibrium.

Taking a macro perspective, Montobbio and colleagues show that different types of proximities affect the process of knowledge acquisition. Their role is related to the emergence and co-evolution of appropriate institutions (e.g. international and national property right regimes). In line with the evolutionary idea that the knowledge diffusion process is shaped by cognitive and institutional forces, the study shows that technological similarity along with a similar language and an homogeneous institutional context contribute more than geographical distance in driving the formation of international research collaborations.

Similarly, Cassi and colleagues discuss the role of proximity in the formation of scientific collaboration in the specific context of an agro-business sector (i.e. the wine industry). Their case provides additional evidence over the importance of cognitive and institutional mechanisms in driving the creation of international knowledge linkages. The authors show that scientific collaboration is more likely among peers, that is, on the one hand the newcomers to the sector, which tend to adopt a market-driven approach to science, and, on the other, the incumbents, which base their strategies on well-grounded routines that are also shaped and reinforced by a strict regulatory environment.

Duysters and colleagues, stress the role of culture in driving the geography of M&A activities by Indian and Chinese firms. While the former tend to be more active in countries with which they share a colonial past, the latter target mainly firms located in nearby countries. Overall, in line with the evolutionary approaches in economic geography (Boschma 2005), these studies show that also in the context of emerging and developing economies knowledge diffusion is driven by institutional and evolutionary forces.

The contributions presented in this issue illustrate that institutional building, knowledge generation and diffusion are the outcome of highly interactive processes and context-dependent selection mechanisms. In this regard, and evolutionary perspective which takes into account institutional change can importantly contribute to improve understanding about the observed variety of development paths, as well as the evolving strategies for knowledge sourcing and technological change by different organisations. Economic actors are socially and historically embedded, therefore they represent collective interests which might be also conflictive. These conflicts can play a significant role in knowledge production and learning, either enabling, shaping or blocking evolutionary trajectories.

To conclude, this special issue aims at advancing the debate about the interpretative power of evolutionary perspectives on economic development, social upgrading and institutional change. It proposes original theoretical and empirical analyses that point out the value of the evolutionary contribution for interpreting development trajectories and opportunities, and, at the same time, broaden the view to research questions, topics and analytical concepts that are central to the development research agenda and have been only marginally considered, so far, in the evolutionary discourse.

Note

1. For a discussion see the special issue of *Economic Geography*, Vol.85(2), 2009.

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