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Entrepreneurship, novel combinations, capital regrouping, and the structure-agency relationship: an introduction to the special issue on innovation and Austrian economics

Paul Lewis¹

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Abstract

This introduction outlines some key aspects of an Austrian perspective on innovation, which is viewed as an ongoing, dynamic process in which entrepreneurs combine heterogeneous capital resources in new ways order to develop and deploy new technologies, products, and methods of business organisation. It goes on to introduce the contributions to this special issue on Austrian economics and innovation.

Keywords Innovation · Entrepreneurship · Capital · Combinations · Lachmann · Systems theory

Innovation is the process whereby new technologies are created and diffuse through the economy to create new products and novel methods of producing existing goods and services. It involves the invention of completely new ideas and the use of existing ideas by organisations that have not hitherto employed them. It is the means through which new knowledge is applied to economic processes in order to increase productivity, national income and living standards (OECD 2005: 46–52, 2015: 3–4).

It is now widely acknowledged that innovation is not best understood using the old, science-centric model that dominated innovation studies during the first few decades after the Second World War. According to the latter, innovation essentially involves a fixed sequence of activities, whereby new knowledge is created through fundamental research and then applied straightforwardly to create novel products and production processes (Bush 1945; Leyden and Menter 2018). On the contrary, innovation is best conceptualised as a complex, non-linear process of knowledge creation and diffusion (Rosenberg 1982; Kline and Rosenberg 1986; Fagerberg 2017: 499–502). This

✉ Paul Lewis
paul.lewis@kcl.ac.uk

¹ Department of Political Economy, King's College London, Bush House (NE), Aldwych, London WC2R 2LS, UK

process involves complicated feedback mechanisms and interactive relations involving science, technology, production, and use. More specifically, it centres on interactions both between firms and also between firms and several other kinds of organisation (including universities and government research institutes, banks, education and training providers, stand-setting institutes and customers, to name but a few). Those other organisations serve as sources of the information, finance, skills, and other resources required for new knowledge to be developed and to diffuse through the economy (Edler and Fagerberg 2017: 9; Fagerberg 2017: 503–05; Lewis 2019: 10–13, Lewis 2020).

In drawing on those resources to innovate, firms—and, more specifically, the entrepreneurs who run them—are seeking to combine resources in new ways order to develop and deploy new technologies, products, and methods of business organisation. This emphasis on *combination* has been a recurrent theme in the literature on innovation, especially in the work of scholars associated with the Austrian school. Schumpeter, for example, conceptualised innovation as centring on entrepreneurs combining resources in new ways (Schumpeter 1934). Another prominent combinatorial approach can be found in the work of Ludwig Lachman, for whom the market process is driven by the innovative but fallible efforts of profit-seeking entrepreneurs to create, dissolve, and regroup of new combinations of complementary capital goods (Lachmann 1956 1978, Lachmann 1977). More recently, David Harper and Tony Endres have built on Lachmann’s work by developing what they describe as a ‘recombinant-capital’ approach to innovation. For Harper and Endres, “all innovation is recombinant capital formation—the application of new combinations of resources in real production process”:

The recombinant capital approach examines innovation from the perspective of entrepreneurs who create capital and organise real production processes. Innovative entrepreneurs are interpretive, creatively constructive change-agents who dissolve and reform capital combinations in the pursuit of profit. They discover gaps in the capital structure and reshuffle resources in order to produce new kinds of goods and services, and make markets for the output of these new capital combinations. (Harper and Endres 2016: 4.)

On this view, innovation is an ongoing process of capital (re)formation, whereby entrepreneurs seek to use their imagination and judgment to penetrate the fog of uncertainty clouding the future and identify how assets can be combined to produce new goods, services and technologies. It is, moreover, an evolutionary process in which new combinations are selected according to their ability to command the support of (co-creative) consumers (Endres and Harper 2012, 2013, 2020; Harper and Endres 2016).¹

While entrepreneurs are the driving force, or efficient cause, of this process, their efforts are shaped—facilitated and constrained—by the institutional framework within which they are embedded. For example, entrepreneurs draw on established legal rules in order to try to ensure that the other organisations with whom they must deal will do what is needed to help bring the entrepreneurs’ projects to fruition. They will also rely

¹ For examples of other recent works emphasising the combinatorial nature of innovation, see Chiles et al. (2010), Arts and Veugelers (2014), Koppl et al. (2015) and Lewis (2017a: 17–19).

on contracts and patents in an attempt to safeguard their intellectual property. Their efforts will in turn contribute to the reproduction—the continued existence—of those rules, as well as on occasions leading, intentionally or otherwise, to their transformation.² By influencing people's activities, the institutional framework within which they take place exerts a significant (material) causal impact on the amount, and kind, of innovation that takes place (Lewis and Runde 2007; Lewis 2011; Endres and Harper 2013: 317–20; Harper 2014; Harper and Endres 2016: 9–11).

Many of the themes mentioned above—the significance of system-theoretic reasoning and Austrian capital theory, the importance of acknowledging the recursive or bi-directional relationship between human agency and social structure, the contribution made to innovation by co-creative consumers, and the usefulness of an evolutionary perspective—are picked up in the contributions to this special issue on Austrian economics and innovation. The first essay sees Lynne Kiesling draw on general systems theory and Austrian capital theory to analyse why digital technology platforms have had such a large impact on the modern economy. For Kiesling, digital platforms are cyber-physical-social systems, where the term 'system' is used in the sense set out in general system theory: they have parts, namely people along with physical and digital components; the interactions between those parts are governed by rules, including legal rules and technological standards; and the system as a whole has emergent properties, in particular the capacity to perform certain functions, not possessed by its individual parts taken in isolation (e.g. Uber's capacity to coordinate people's plans to travel via taxi cab and the supply of rides).³

Kiesling argues that the key feature of such systems, which accounts for their impact on the modern economy, is 'modularity', by which she means "the extent to which a system is composed of smaller, often standardized, parts." "Modularity is a key feature enabling the value of digital technology platforms," Kiesling argues, because it "increases the degree of both substitutability and complementarity of capital components, amplifying their effects in ways that manifest in more scalable and adaptable systems." Kiesling elaborates as follows:

Modularity increases substitutability among components because components are more self-contained and interact with each other according to specific, clear, shared rules. Modularity reduces the cost of replacing and recombining components, so reconfiguring and extending systems is cheaper and easier than in a non-modular system. This feature is the essence of scalability in networks — can we replicate this combination of components, this system, and connect together these replicated systems to make a larger scale system of systems? That process has been the fundamental dynamic of digital systems, including digital platforms, and the driving growth process underlying the digital economy.

² As Hayek put it, legal rules "could almost be described as a kind of instrument of production, helping people to predict the behaviour of those with whom they must collaborate" ([Hayek 1944] 2001: 77).

³ For more on systems, and the notion of emergent properties, see Harper and Endres (2012), Harper and Lewis (2012), and Lewis (2016, 2017b).

Kiesling draws on a case study of Uber to argue that by specifying and standardising interfaces between components, modularity reduces the cost of connecting and reconfiguring components in order to create a capital system for production. In this way, modularity makes digital systems more scalable and more adaptable in the face of unknown and changing conditions, thereby accounting for their rapid development and diffusion.

The starting point for Niclas Elert and Magnus Henrekson's "Entrepreneurship Prompts Institutional Change in Developing Economies" is the recognition of the bidirectional relationship between entrepreneurship and institutions: entrepreneurship is both constrained and enabled by the institutional context in which people are situated, with formal and informal institutions influencing both the extent and the character of the entrepreneurship that takes place; but entrepreneurship is also a significant cause of institutional change.⁴ The specific motivation for Elert and Henrekson's paper is provided by their belief that "this bidirectionality has been largely overlooked in development contexts, even though the manner in which entrepreneurs respond to institutions is likely to be especially relevant when institutional quality is relatively poor." Elert and Henrekson aim to fill gap in the literature by exploring the various ways in which entrepreneurs may seek the change the institutional framework within which they are embedded.

Elert and Henrekson start from a broad definition of entrepreneurs as "social change agents who, despite the radical uncertainty we all necessarily confront in the world, notice, cultivate, and exploit opportunities to bring about economic, social, political, institutional, ideological, and cultural transformations" (Storr et al. 2015: 123). They go on to identify three different categories of entrepreneurial response to institutions, namely abiding by the rules, altering them or evading them. Each of these kinds of response may—to use Baumol's (1990) terminology—be either productive or unproductive, giving rise to a six-fold typology of entrepreneurial responses to institutions. Each may in turn lead, intentionally or otherwise, to institutional change. Elert and Henrekson discuss each of their categories of entrepreneurship in the context of developing and transition economies, drawing on a rich set of empirical examples in order to analyse the circumstances under which entrepreneurship is likely to lead to institutional inertia or change and to be welfare-reducing or enhancing. Their analysis leads them to conclude that, "Bottom-up processes are crucial for breaking out of the low-income trap in which many countries still find themselves."

David Harper's essay on 'Entrepreneurial Aesthetics' begins with the observation that few economists have studied the aesthetic dimension of economic life. He seeks to remedy this omission by identifying some of the conceptual "building blocks needed for a more fully developed theory of the aesthetics of entrepreneurship and consumption." For Harper, the aesthetic dimension of innovation and entrepreneurship involves the creation, interpretation and evaluation of aesthetic objects (that is, goods, services and events that give rise to meaningful experiences for consumers). Defining different kinds of aesthetic experience by reference to the various ways in which people can exercise attention, Harper identifies four categories of aesthetic experience and argues

⁴ Further discussions of the bidirectional or recursive relationship between human agency and social structure, set within the context of Austrian economics, can be found in Lewis (2005, 2017), Lewis and Runde (2007), Runde (2001) and Wagner (2010).

that the set of objects with which people can enjoy aesthetic encounters extends well beyond works of art and luxury goods and services to encompass ordinary, everyday objects (including, but not restricted to, icons of design such as the Apple iPhone and iPad).

In keeping with his earlier Popperian account of entrepreneurship (Harper 1996), Harper portrays the aesthetic dimension of the market process as involving the creation of aesthetic objects by entrepreneurs who offer them to consumers through a “a trial-and-error elimination process that involves aesthetic conjecture and refutation.” On this view, the market is amongst other things “a site of aesthetic production and a forum of aesthetic experience” in which entrepreneurs and consumers co-produce “new kinds of aesthetic experiences”.⁵ Their efforts to do so are informed by shared aesthetic visions, standards and rules (e.g., brands) that serve as “orientation schemes” that inform and guide the efforts of entrepreneurs and consumers to (co-)produce new aesthetic objects and experiences (cf. Lachmann 1970). Of course, such activities themselves contribute to the reproduction—or, on occasion, the transformation—of those visions, standards and rules in what one might term a transformational model of aesthetic expression and appreciation (cf. Lewis and Runde 2007). In the case where established standards are transformed, we have a situation in which, as Harper puts it, “Through brand building, entrepreneurs and co-creative consumers create new modes of aesthetic expression and orientation. They creatively fuse elements from different genres into new aesthetic forms (‘aesthetic mash-ups’) that are characterized by a distinctive style.”

Harper elaborates on his argument through a rich case study of one of the pioneers in the field of entrepreneurial aesthetics, namely Harry Gordon Selfridge. Selfridge’s decision to house his stores in architecturally striking buildings, and his innovative use of window-dressing and in-store displays, transformed “modern-day shopping into an aesthetic experience in which beauty plays a prominent role.” This example illustrates Harper’s claim that, “Entrepreneurial aesthetics is an important source of creativity and innovation, and it provides real fuel for the engine of economic change and development.”

In “Bureaucrats or Markets in Innovation Policy? – A critique of the entrepreneurial state”, Nils Karlson, Christian Sandström, and Karl Wennberg criticised the standard, neoclassical approach to innovation policy (Nelson 1959; Arrow 1962). According to the latter, if the process of research and development (R&D) that (on the neoclassical account) drives innovation is left to market forces, then too little knowledge creation—and, therefore, too little innovation—will occur. This is because, thanks to the public good attributes of new scientific knowledge, firms investing in research and development will find it hard to appropriate the returns generated by their investment, deterring them from making such investments in the first place. This ‘market failure’ provides a rationale for government intervention designed to raise the level of investment in research and development up to the socially optimal level, for example through the use of government grants and subsidies designed to sharpen firms’ incentives to engage in R&D. Karlsson et al. review the literature on the effectiveness of such policies, arguing that it suggests that the “positive effects of innovation policies are often exaggerated and that outcomes in terms of more innovations, entrepreneurship and growth have been disappointing.” The reason, they argue, lies in the way that

⁵ For more on the notion of co-production, see Ostrom (1996).

information and incentive problems make it hard for policy-makers firstly to identify genuine cases of market failure and then to specify and implement the appropriate response. The upshot, Karlson et al. contend, is that there is significant scope for government failure.

Karlson et al. go on to highlight another shortcoming of the market failure approach, stemming from its reliance on the narrow, linear, science-centric view of innovation described earlier in this Introduction. The latter arguably over-emphasises the significance of fundamental R&D for innovation at the expense of doing justice to the importance of the processes through which that knowledge comes to diffuse widely throughout the economy. As Karlson et al. write, “*The commercial exploitation of new knowledge is an equally important ingredient in economic growth as the creation of new knowledge through R&D and the like*”. In particular, by assuming that the new knowledge created through R&D can be applied straightforwardly to create novel products and production processes, approaches—such as neoclassical economics—that rely on the linear view of innovation fail to provide a satisfactory analysis of the role of market-based processes of entrepreneurial discovery in driving the diffusion application of new knowledge in ways that increase productivity and national income: “the market failure approach suffers from an exclusive focus on *knowledge creation*”, Karlson et al. argue, “as it ignores the equally important mechanisms of *knowledge dissemination and creation through commercial exploitation* in markets.” What is needed in order to do justice to the true nature of innovation as a complex, dynamic, non-linear processes of knowledge discovery and diffusion is a new theoretical approach that “emphasises coordination and knowledge problems rather than resource allocation problems, and that draws on evolutionary economics, Austrian market-process theory, and new institutional economics ... [that] emphasise[s] that the economic problem is the discovery of value not invention of new technology.”

One such approach, considered in Paul Lewis’ contribution to the special issue, is provided by innovation systems (IS) theory. The latter is one of the most important and influential contemporary perspectives on innovation and innovation policy. It portrays innovation as the generation and widespread diffusion of knowledge about new products and methods of production.⁶ This takes place via a complex, non-linear process involving interactions between firms and many other kinds of other organisations—including universities, banks, technical standard institutes, and various public sector organisations—who help to contribute the knowledge, finance, skills and other kinds of resource needed to develop and deploy new technologies at scale. Innovation therefore depends critically upon the institutional rules governing those interactions, giving rise to the question of what rules are most effective in facilitating this process. When the rules in question do not disseminate the information and other resources, and fail to coordinate the activities, required to ensure that new technologies are developed and diffuse through the economy as effectively as possible, then a ‘system failure’ is said to occur, in which case there may be scope for government policy to improve the framework of rules (Smith 2000; Metcalfe 2005, 2007; Edler and Fagerberg 2017).

⁶ More specifically, and in keeping with the combinatorial approach described above, the IS approach portrays innovation as centring on the recombination of organisational routines, which are then subject to a dynamic, non-equilibrium process of selection and replication (Nelson and Winter 1982; Harper 2018: 983–85).

Lewis notes that the IS approach has significant affinities with Austrian economics, not least in conceptualising the market as a complex evolutionary process that centrally involves the creation and diffusion of knowledge and whose operation is shaped by the framework of rules within which it takes place. Both perspectives also suggest that standard accounts of market failure provide an inappropriate benchmark for evaluating performance and identifying appropriate policies (Chaminde and Edquist 2010; Metcalfe 2005, 2007; Lewis 2013; Furton and Martin 2019). However, it is increasingly being recognised that, as one recent survey of the IS approach has put it, “one of the core problems ... is that, in general, a myriad of constellations of system elements could lead to similar levels of innovation success, while similar constellations could lead to widely varying outcomes depending on the context conditions” (Weber and Truffer 2017: 113). Lewis suggests that this may reflect a feature of complex innovation systems highlighted by Hayek (1967] 2014) and Elinor Ostrom ([1986] 2014, [1998] 2014), namely the way that their properties—such as their capacity to generate and diffuse knowledge about new technologies—arise from the *causal interaction* between a set of interdependent rules, whereby individual rules have a different impact depending on the other rules with which they are combined. If the functioning and consequences of any one rule depends on the other rules in the system of which it is a part, then this makes it harder for policy-makers to identify appropriate policies than it would be if rules combined additively (so that their combined effect is simply the sum of their separate effects taken in isolation). Such epistemic problems arguably lie behind at least some of the difficulties that advocates of the IS approach have acknowledged arise in devising innovation policies. Lewis contends that allowing a more experimental or bottom-up approach to policy within a polycentric framework may be an appropriate response to such epistemic challenges.

Similar issues are raised by Sujai Shivakumar in his “Beyond Clusters: Crafting Contexts for Innovation.” Shivkumar considers the tendency of firms related by knowledge, skills, inputs and other linkages to co-locate geographically in ways that stimulate innovation. He argues that, “While proximity can lower some costs and increase the potential for interaction among these tenants, proximity by itself is not sufficient to overcome a variety of challenges to collective action that they must be overcome in order to bring innovative products and services from the laboratory to the market.” The question therefore arises of what distinguishes successful from unsuccessful clusters. The answer, Shivakumar argues, lies in the ability of the relevant organisations to solve various kinds of collective action problem:

The transformation of collocated facilities and expertise into innovation clusters requires that multiple individual actors recognize the opportunities and synergies that can arise from cooperation, diagnose prevailing collective action problems, and craft the rules needed to solve the myriad challenges to working together. Indeed, real world clusters exhibit a complex web of interconnected private, public, and hybrid institutional arrangements.

Drawing on an innovations systems view, according to which the successful development and diffusion of new technologies requires contributions from a variety of different organisations, Shivkumar argues that cluster-based innovation “clusters

requires cooperation among the multiple actors spread across different organizations in order to fund, research, develop, scale-up and bring new products and services to the marketplace.” But cooperation can falter, as some of the relevant actors may fail to do what is necessary for successful innovation to take place. “In particular instances,” Shivakumar argues, “some actors may not contribute to a joint effort fearing that others may free ride on their efforts or may contribute less than is necessary to generate and maintain shared public goods,” as for example when firms fail to invest adequately in training because of fears that the skilled workers needed to deploy new technologies will be poached by rival organisations.

Shivakumar identifies several ways in which the organisations involved in innovation are able to deal with these problems, some involving only private sector organisations whilst others rely on public-sector organisations as well. Industry consortia involve private-sector firms channelling funding for high-spillover, upstream research into a separate organization where it is carried out collectively. In doing so, Shivakumar argues, they form a “club” that enables them to pool resources and generate public goods with benefits restricted to its members (Buchanan 1965). In this way, “firms and research groups can accelerate the development of platform technologies while still competing in the market for derivative applications.” Other ways of solving collective action problems may involve public as well as private sector organisations. For example, public funding can be used to support the creation of demonstration facilities such as pilot plants that enable firms to show that new technologies that have hitherto been shown to work only on a small-scale, in the research laboratory, can also operate effectively at the larger scale required for commercialisation, thereby reducing the risks of commercialising and making the projects more attractive to private investors.

Drawing on the work of Elinor and Vincent Ostrom (E. Ostrom 1990, 2005; V. Ostrom 1971), and building on his own earlier work (Shivkumar 2017), Shivakumar argues that the search for such solutions will be facilitated if the organisations—both public and private—are afforded the opportunity to experiment with diverse institutional arrangements for governing their interactions, as is the case in a polycentric system: “As a bottom-up approach, polycentricity allows for the relevant actors to take the initiative to solve problems of working together, develop their own networks, and create and monitor the rules governing specific arenas of cooperation. At the same time, from the top-down, the notion of polycentricity encourages the creation of broader sets of formal and informal rules that knit together the activities and interests of the various networks into a broader community—with the intention of bringing about the characteristics we associate with successful clusters”. To put this slightly differently, using a Hayekian metaphor, a polycentric system can help to by affording the organisation involved in innovation the chance to craft their own solutions to collective action problems, a polycentric system can help to cultivate innovation without involving an attempt to control the final outcome (cf. Hayek 1955 2014: 210, Hayek [1975] 2014: 371–72).

Mikayla Novak draws on Austrian insights to develop a fresh perspective on social innovation. For Novak, roughly speaking, social innovation is the creation of social novelty, involving the development of new norms and practices and their diffusion through society via evolutionary processes, leading to novel forms of behaviour and different social outcomes (Mulgan 2012a, 2012b). Such developments may often be associated with efforts to solve various kinds of social problem (Domanski and Kaletka

2018). For Novak, ideas that long been central to the Austrian account of the market process (see, e.g., Kirzner 1973, Hayek 1976: 107–32), and which have been applied more recently to non-market decision-making (Chamlee-Wright and Storr 2015a, 2015b)—such as entrepreneurial discovery, spontaneous order, knowledge dispersion and feedback—can fruitfully be applied to the study of social innovation.

For example, to take an example discussed by Novak, Austrian economics' emphasis on the importance of profit and loss as a key source of feedback on people's resource allocation decisions can encourage those studying social innovation to consider whether "some form of (perhaps, to some, 'looser') feedbacks exist as reasonably effective modes of guidance for social entrepreneurs and other purveyors of social innovation to discover and exploit avenues to enhance human well-being" (see, e.g., Chamlee-Wright and Myers 2008, Chamlee-Wright and Storr 2015a). Novak argues that a key question concerns whether these and other "non-price information feedback mechanisms can mimic other important qualities of market prices, at least enough to move non-market processes of social coordination and cooperation in the right direction, in which cooperation between people known to one another can systematically advantage unknown others far removed from the original social exchange" (quoting Chamlee-Wright and Myers 2008: 165). Novak goes on to argue that this chimes with the way that scholars in the social innovation literature have found that "the competitive sourcing of donation revenues for social entrepreneurs, and organisations founded on a non-profit basis, provides incentives encouraging the discovery and exploitation of solutions to often deep-seated societal problems."

In 'Blockchain and Investment: An Austrian Approach', Darcy Allen, Chris Berg, Sinclair Davidson and Jason Potts use Austrian capital theory to analyse the nature and impact of a recent innovation in governance, namely the advent of blockchain technology. Defining blockchain as "a new institutional technology of distributed and decentralised ledgers for recording social facts such as identity, licensing, registries, property ownership and transfers, contracts, information and data", Allen et al. focus in the first instance on its impact on the structure of production. Starting from the point, which is central to Austrian capital theory, that production takes place over time, Allen et al. argue that blockchain will reduce the cost of the contracts needed to govern productive activities. This "reduction in the cost of trust (owing to an improvement in the technology of trust) will have the same effect on equilibrium capital structure as a fall in the interest rate ... [namely it will] cause an increase in 'roundaboutness', thereby increasing consumption in the long run."

After having drawn out additional implications of their analysis for investment and the business cycle, Allen et al. go to discuss the broader significance of blockchain, both for the economy and also for the development of Austrian economics:

Blockchain or distributed ledger technology are institutional technologies of governance that supply decentralised coordination of identity management, record-keeping, registries, asset-transfer, payments and contracting. This suite of new institutional technologies is furnishing new ways of privately supplying economic coordination through money, property rights, and organisation through private provision of platform governance rules and mechanism for exchange and contracting ... What we are now observing is not only the de-nationalisation of

money (*viz.* Hayek 1976), but a far broader de-nationalization of ledgers and therefore the basis of identity management, property rights, law, and record-keeping and social permissioning (e.g. licensing, credentialing, registries). The arrival of blockchain technology is beginning to usher in new domains of economic competition beyond the margins of factor market competition (e.g. substitution of capital for labour, in the context of centralised provision of the services of ‘order’) but to competition in the provision of order itself

On this view, the operation of the market is based ultimately on trust (cf. Seabright 2004). But whereas in the past the tendency has been to rely on “the centralised manufacture of trust” by the state, the advent of blockchain “is an ‘existence proof’ of the possibility of decentralised provision of the institutional conditions for trade and exchange, which is to say of the manufacture of trust to facilitate economic coordination.” The study of such new “technologies of self-sovereignty”, as Allen et al. felicitously describe them, is another important contribution to the burgeoning field of Austrian economics that focuses on analysing “institutional competition and innovation in the production of governance”.

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