Entrepreneurship researchers have long celebrated that “scholars from diverse vantage points and fields of orientation” are interested in contributing to a better understanding of entrepreneurial activity (Hisrich, 1988: 3). The belief that “no single subject discipline has a monopoly of wisdom about what entrepreneurship is, or how entrepreneurs behave” is quite widespread (Parker, 2005: 1). It is well known that entrepreneurship inquiry, like management and organizational research in general, builds on psychological, sociological, and economic scholarship (Grégoire, Noel, Dery, & Bechard, 2006; Streb & Gupta, 2011). Contributions to entrepreneurship research go beyond these disciplines, however. Theories, principles, and research methods from a variety of disciplines, including the liberal arts and natural sciences, have frequently been used in advancing knowledge about entrepreneurship. Low (2001: 21 emphasis original) contends that “entrepreneurship is a phenomenon or a set of questions that can and should be investigated from multiple disciplines and perspectives,” an argument that continues to resonate with entrepreneurship scholars. Some go as far as to claim that “much of the best research in entrepreneurship” appears in the good journals of other disciplines (Acs & Audretsch, 2003: 5).

Landström and Benner (2010: 38) divide the academic field of entrepreneurship research into two distinct groups of scholars: a community of ‘entrepreneurship researchers’ with a disciplinary anchor in
Management studies (let’s call them Type X) and another community of researchers anchored in different disciplines who sometimes do entrepreneurship research (let’s call them Type Y). There is, however, another important—albeit small—research group in entrepreneurship: researchers from other disciplines who view themselves primarily as entrepreneurship scholars. These researchers participate actively in the ongoing scholarly conversation about entrepreneurial phenomena (let’s call them Type Z). Type Z scholars have strong disciplinary roots, but their contributions are targeted largely at advancing the conversation in entrepreneurship. Most likely, the Type Z camp is small and scattered across several different disciplines, which makes this group of scholars seem even smaller to those on the outside.

The citations for the GAER awardees reveal that four scholars have been recognized for advancing entrepreneurship research from a disciplinary perspective: the 2000 award to Howard Aldrich, in 2003 to William Baumol, in 2006 to Israel Kirzner, and in 2010 to Josh Lerner. All four scholars have done interesting research about entrepreneurial phenomena, as discussed below in order.

Howard Aldrich: A Sociological Perspective

The 2000 GAER awardee, Howard Aldrich, was recognized for “integrating the most central questions of the field, examining the formation and evolution of new and small firms within a broader sociological research context.” Over the course of his career, Aldrich (2012: 1240) saw entrepreneurship research transform “from groups of isolated scholars doing research on small businesses to an international community of departments, institutes, and foundations promoting research on new and high-growth firms.” Drawing on his sociological training, Aldrich made seminal contributions to the evolution of the academic field of entrepreneurship and remained true to his disciplinary training throughout his academic career (Landström, 2005). Sociologists have long been interested in how social structures—whether in the form of norms, expectations, interpersonal relations, or institutions—constrain and facilitate human action and choices. Not surprisingly, there is a strong recognition that “the field of sociology has much to offer….to those interested in studying entrepreneurship” (Alvarex, Agarwal, & Sorenson, 2005: 6). In applauding Aldrich’s contributions to entrepreneurship research, Landström (2005: 325) noted that his “work is characterized
by true scientific curiosity and a theoretical strength that is unique in entrepreneurship research.”

Aldrich’s interest in new business founding goes back to his doctoral days when he was studying how small business owners coped with hostile conditions around them (Landström, 2005). Aldrich is seen as a prominent example of someone whose contributions to entrepreneurship inquiry rested on his deep understanding of one central theoretical framework: evolutionary theory (Landström, 2005). For Aldrich and Martinez (2001: 42), evolutionary theory uniquely brings together “in a single coherent framework a concern for entrepreneurial outcomes and the processes and contexts making them possible, using the basic concepts of variation, adaptation, selection, and retention.” Because evolutionary approaches allow to study the birth of new organizations (variation), ways in which firms adapt to survive as environments change (adaptation), when such efforts succeed in increasing organizational survival (selection), and how successful arrangements are imitated by others (retention), scholars can use evolutionary theory to better understand entrepreneurial phenomena.

To make sense of Aldrich’s contributions to entrepreneurship research, one needs to start by understanding the evolutionary perspective. Given that, on the whole, evolution is considered a solid body of scientific knowledge, albeit with ample subfields worthy of continued discovery and sustained research, it would seem that evolutionary theory is well understood. Unfortunately, that is far from the case. As Hodgson (2013: 973) observed, evolution is “a widely used but ambiguous term.” Evolutionary theory, as is generally known, originated with the publication of Charles Darwin’s seminal work *The Origin of Species* in 1859. However, Darwin did not, as many believe, “discover or invent evolution” (Dunnell, 1980: 39). Darwin, in fact, seems to have avoided the term ‘evolution’ and employed the phrase ‘descent with modification’ instead (Ruse, 1999). And yet, even during Darwin’s own lifetime, evolution was being credited to Darwin, including by his critics.

For most scholars, the goal of Darwin’s work was twofold: to establish the mutability of organic species in their “descent out of the past” and to offer natural selection as “the primary mechanism” to explain these variations (Gillispie, 1958: 388). As Darwin (1871: 61) wrote, “I had two distinct objects in view; firstly to show that species had not been separately created, and secondly, that natural selection had been the chief agent of change.” The Darwinian position considers the evolutionary process as
comprising of three distinct mechanisms: variation, selection, and retention. Variation deals with how variety is generated and replenished in a population, selection pertains to the factors facilitate the survival of some variations rather than others, forcing a reduction in variety, and retention refers to how useful information concerning solutions to adaptive problems is transmitted across generations.

Aldrich and Pfeffer’s (1976: 81) explanation of the three core mechanisms of Darwinian evolution is worth repeating here in full because it is this framework that remained consistent throughout Aldrich’s subsequent work (Landström, 2005):

The first stage ... is the occurrence of variations for whatever reason, planned or unplanned. In organic evolution, variations occur through the genetic mutation process, while in the learning process variation occurs in the exploratory responses made to stimuli. Variations are the raw material from which the selection process culls those structures or behaviors that are most suitable. The second stage is the operation of consistent selection criteria that differentially select some variations over others or selectively eliminate certain variations. In organic evolution the differential survival of certain mutant forms that are better able to exploit the food supply in their environment reflects the operation of a resource-based selection criterion. Differential reinforcement of particular exploratory responses by animals, in a consistent manner, is the selection stage in the learning process. The third stage in the ecological process involves the operation of a retention mechanism for the selective retention of the positively selected variations. Retention occurs when certain variations are preserved, duplicated, or reproduced. In organic evolution the retention mechanism is the chromosome-gene system. Positively selected variations survive and reproduce similar others. For the learning process the memory system is the means whereby positively selected responses can be recalled for future use. The process as described is perfectly general and can be applied to any situation where the three stages are present. The three-stage model completely describes the evolutionary process.

Low and Macmillan (1988) identified two major research perspectives in entrepreneurship research: environmental determinism (population ecology), which considers environmental selection as the decision factor in firm survival and strategic choice, where the individual entrepreneur decides the trajectory of the firm. Breslin (2008) views evolutionary theory (and Aldrich’s work in this area) as incorporating both major perspectives, providing a middle-way to understand entrepreneurship.
Evolution as the middle-path is about how entrepreneurs learn as they create new organizations, and based on feedback in the form of outcomes to their efforts, adapt their strategies through interaction with the environment (Hrebiniak & Joyce, 1985).

Aldrich (1979) focuses on organizational change, particularly the “conditions under which organizations are created, grow, establish relations with important actors in their environments, adopt tactics for survival, and quite often, fail” (page 1).\(^1\) Taking the position that the survival and growth of organizations are an attribute of the population (Astley, 1980) and Aldrich (1979) encouraged researchers to analyze total ‘populations’ of organizations in their environments. Freeman (1981: 1450) praised Aldrich (1979) for attempting to construct “an extensive conceptual scaffolding” on “very little empirical literature,” suggesting that, when it came to the application of evolutionary theory to organizations, there was not yet enough empirical research to support the framework and arguments that Aldrich (1979) presented. Aldrich (2008: xvi) recounted that when he sought “an overarching framework for investigating organizational change” he was attracted to evolutionary logic “because it is generic framework for understanding social change...applicable at multiple levels of analysis.”

Where Aldrich (1979) introduced the potential of evolutionary approach to explain organizational change, Aldrich (1999) is considered “a major leap forward” as it achieved a “stunning synthesis of the major organizational paradigms under the umbrella of evolutionary theory” (Dobbin, 2001: 1521). Wade (2002: 390) commended the “very broad, eclectic nature” of Aldrich’s (1999) writing. For others (e.g., Buenger, 2000: 1004), Aldrich (1999) provides a good coverage of populations and communities, but does not meet the needs of readers who are “looking for the Darwinian imperative as it applies to organizations.” Even though both Aldrich (1979) and Aldrich (1999) focused on an evolutionary approach, much had changed in Aldrich’s thinking during the two decades between the two books. In the 1970s, Aldrich (2018: 22) saw himself as “an organizational sociologist studying organizations from an evolutionary point of view,” but by the end of the century, he had emerged as a prominent entrepreneurship scholar. Most

\(^1\)The book was originally titled *The Organizations and its Environment*, but Aldrich came to realize that “using the definite article (the) implied a homogeneity and singularity in which [he] no longer believed” (Aldrich, 2008: xvii).
Ph.D. students interested in entrepreneurship get their first exposure to Aldrich’s work from reading Aldrich and Fiol (1994). By 1999, Aldrich had come to believe that “many of the phenomena that interested” him were “much easier to study in the entrepreneurial context, where things are fresh, new, and small and constituted an instant organizational laboratory with thousands of replications every day” (Aldrich, 2018: 22). Interestingly, in a departure from strict Darwinian evolutionary logic, Aldrich and Fiol (1994: 647) emphasized the “cumulative way in which entrepreneurial activity plays a role in reshaping the larger environmental context.” For Aldrich and Martinez (2001: 52), emphasizing the varied actions entrepreneurs take to successfully create and manage their firm contributed to “a more evolutionary view of entrepreneurial activities.”

Aldrich and Ruef (2006: 3) sought to explain the “evolutionary processes through which new organizations, populations and communities emerge, using an approach that cuts across academic disciplines.” Stoelhorst (2008: 1017) commend Aldrich and Ruef (2006) for their deep dive into “Aldrich’s evolutionary perspective as it took shape in the wake of the diversity of new theoretical developments of the 1970s.” Many others, however, were considerably more scathing in their analysis. Describing Aldrich and Ruef (2006) a “chore to read,” Glor (2006), for example, criticized it for focusing too narrowly on business organizations and ignoring the historical context within which the organizations evolved. The criticism about ahistoricity in the study of organizations is particularly salient when one considers that the “evolutionary approach encompasses many of the best features of historical research on organizations” (Lippmann & Aldrich, 2014: 125). The strength of Aldrich and Ruef (2006) lay in its treatment of evolutionary theory at multiple levels of analysis, directing attention to the processes of variation, selection, and retention that jointly produce change in systems struggling for survival. For entrepreneurship scholars, Aldrich and Ruef’s (2006) message was that those evolutionary processes are driven by the entrepreneurs and organizations striving to obtain scarce resources.

Landström (2005) described Aldrich as “an internationally recognized organizational sociologist, who has highlighted entrepreneurship,” praising him for effectively demonstrating “how a researcher from a core scientific discipline can contribute important insights into the field of entrepreneurship.” While evolutionary theory is at the core of Aldrich’s research, his research has also delved into other important areas in entrepreneurship research. His scholarship includes areas as diverse as
ethnic entrepreneurship (e.g., Aldrich & Waldinger, 1990; Waldinger, Aldrich, & Ward, 1990; Zimmer & Aldrich, 1987), gender entrepreneurship (Baker, Aldrich, & Nina, 1997; Renzulli, Aldrich, & Moody, 2000; Yang & Aldrich, 2014), social networks (Aldrich & Kim, 2007; Kim & Aldrich, 2005; Kim, Aldrich, & Keister, 2006), and even crowdfunding (Aldrich, 2014), among others (e.g., Aldrich & Cliff, 2003; Aldrich & Yang, 2012; Yang & Aldrich, 2012).

Ever since the publication of Darwin (1859)’s seminal work, there has been tremendous interest in the possibility of expanding the evolutionary approach beyond the domain of biology to fields of study as diverse as language, psychology, economics, and culture (Breslin, 2010). Darwin himself suggested generalizing core Darwinian principles to cover the evolution of social entities (Hodgson, 2007). Many scholars credit Darwin with proposing that natural selection operates upon the elements of language and that natural selection favors tribal groups with moral and other propensities that served the common good (Aldrich et al. 2008). For Universal Darwinists, at a sufficiently general level of abstraction, the principles of variation, selection, and retention can be used to describe evolution within a variety of domains (Breslin, 2008). However, the generalization of core Darwinian principles to other disciplines has been passionately advocated by some and vehemently resisted by others (Dennett, 1995), an ongoing debate that has not gone unnoticed even in the popular press (Wade, 2009).

Some have argued that Darwinistic explanations of organizational change ignore the interaction of the actor with the external environment through feedback (Cordes, 2006). This seems to have been the concern of Hougland and Shepard (1980: 139) when they observed that Aldrich (1979) had “little to say about how organizations influence external actors” and “ignores the “environmental impact of organizations.” In biological evolution, the environment cannot be affected by the entities, but instead it is the organisms that cope with the environment more or less successfully. Aldrich does seem to recognize that organizations can

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2The term ‘Universal Darwinism’ was coined by Richard Dawkins to suggest that the core Darwinian principles of variation, replication, and selection apply not only to biological phenomena but also to other open and evolving systems, including human cultural or social evolution (cf. Dawkins, 1983). Hodgson and Knudsen (2004) initially adopted the term ‘universalized’ Darwinism to characterize their position, but Hodgson and Knudsen (2006) employed the term “generalized” Darwinism. Both terms are now used interchangeably in the literature (Buenstorf, 2006).
affect their environment, but only in a very limited fashion. To quote Aldrich (1979: 292–293), “the 2% of all business organizations in the US with receipts of more than $1,000,000 are in good positions to influence their environments, whereas the two-thirds with less than $25,000 in receipts are poorly placed for such attempts.” Notwithstanding concerns about “two empirically untestable statements” in the above sentence (Astley, 1980: 285), the truth is that even small firms have been found to have substantive impact on organizations. The popular press is replete with stories of how, despite being unprofitable, upstart firms like Uber and WeWork were able to challenge environmental constraints and forced major stakeholders to adjust to a new reality. There seems no biological equivalent of the widespread phenomena that (some, but not all) organizations are able to bring about environmental change. Indeed, Astley (1980: 286) criticized Aldrich (1979) for taking the position that “most organizations are, in an absolute sense, small, powerless, and transfixed by their environment.”

Aldrich (1999) is recognized as a prominent advocate for a meta-theoretical ‘evolutionary perspective’ as a way to “express the conceptual core and unite separate disciplinary approaches” in the social sciences (Hodgson & Lamberg, 2018: 168). Lippmann and Aldrich (2014) explain their position thus:

Evolutionary theory in organizational analysis is a set of heuristic propositions about how entities develop through time (Aldrich, 1979; Langton, 1984). It uses and adapts Darwinian theories of natural selection, in combination with Probability and Complexity Theories, resulting in a meta-theoretical framework that explains how organizational emergence, change, and reproduction occur through the interaction of blind and intentional variations with environmental selection forces. Recent developments in evolutionary theory have emphasized two things. First, they have focused on the multi-level nature of evolutionary processes between groups within organizations, across organizations, and across populations and communities. Second, they have demonstrated the interdependence of selection and adaptation processes. When organizational actors adapt to their environments by actively choosing particular variations, they not only select them into their own organizations but also introduce new selection forces into organizational populations through a variety of learning and isomorphic processes. (Argote & Miron-Spektor, 2011)
Evolutionary theory, as understood by Universal Darwinists, uses v-s-r logic (variation, selection, and retention) to describe phenomena within a variety of domains, which makes it quite cross-disciplinary. Glor (2006) criticizes Aldrich and Ruef (2006) for ignoring the knowledge accumulated in other social sciences and building an understanding of organizations on a very narrow knowledge base. Clearly, the academic conversation about important evolutionary issues associated with the organizational world remains in flux. Much has been learned, yet much more work still needs to be done.

William Baumol: An Economic View

The 2003 GAER recipient, William Baumol, was among the first economists to highlight the absence of the entrepreneurial element in mainstream economics, encouraging fellow economists to pay attention to the role of entrepreneurship in the economy. To repeat his now famous words, from an economics perspective, the “theoretical firm is entrepreneurless – the Prince of Denmark has been expunged from the discussion of Hamlet” (Baumol, 1968: 68). He has been hailed as “one of the great economists of the 20th century… whose stray thought on a sleepless night could change how people see the world” (The Economist, 2017: 33). The official GAER citation honors Baumol “for his persistent effort to give the entrepreneur a key role in mainstream economic theory, for his theoretical and empirical studies of the nature of entrepreneurship, and for his analysis of the importance of institutions and incentives for the allocation of entrepreneurship.”

3 Schumpeter (1942: 86) uses a similar formulation: A “theoretical construction which neglects this essential element of the case neglects all that is most typically capitalist about it… it is like Hamlet without the Danish prince.”

4 The ‘stray thought on a sleepless night’ referred here is the principle that later came to bear his name: Baumol’s cost disease. Grappling with the question of why the cost of presenting and attending arts was going up, Baumol had an epiphany one early morning in the 1960s. As Baumol recounted in an interview with the economist Alan Krueger (2001), “One night, it was 4:00 in the morning, I suddenly woke up and said I know why those costs are going up! I got up, wrote down a few notes, and went to sleep again. That’s literally how it happened.” At its core, Baumol’s cost disease is the idea that personally delivered services—medical care, musical performances, and education, for example—will increase in price year after year. See Baumol (1967), Baumol and Bowen (1966).
Baumol’s earliest contribution to entrepreneurship research stems from his seminal observations about the virtual absence of the entrepreneur from the mainstream economics literature (Baumol, 1968), urging economists to pay serious attention to the role of entrepreneurship in economic development (Schiller & Crewson, 1997). The starting point for Baumol (1968) was neoclassical economics. Conventional interpretations of the neoclassical model posit that all individuals have perfect information and their economic objectives are clearly established and unambiguously stated. In the neoclassical world, producers and consumers reach one set of prices at which the supply of each good is equal to its demand, and all markets that are assumed to exist are cleared at equilibrium prices (Wennekers & Thurik, 1999). As van Praag (1999: 317) noted, the neoclassical model, with “its production function, the logic of rational choice and perfect information; leaves no room for an active entrepreneur…the firm runs itself…[and] the entrepreneur has vanished.” By the 1960s, the surprising absence of the entrepreneur from the mainstream economics literature was already being lamented by many economists (Bosma, 2011; Hamilton, 2011). Baumol’s (1968) witty comment likening the entrepreneur to the Prince of Denmark earned him the reputation of being a vocal critic of the absence of the entrepreneur from the theoretical firm (Deligonul, Hult, & Cavusgil, 2008).5

Baumol, perhaps more than any other modern economist before him, noted the conflicted position of the entrepreneur in economic thinking. Baumol (1968: 64) observed that the entrepreneur “has long been recognized as the apex of the hierarchy that determines the behavior of the firm and thereby bears a heavy responsibility for the vitality of the free enterprise society.” Yet, and despite the apparent recognition of the crucial role entrepreneurs play (Schiller & Crewson, 1997), the entrepreneurial function had “virtually disappeared from the theoretical literature” in economics (Baumol, 1968: 64). Consequently, the entrepreneur was “at the same time one of the most intriguing and one of the most elusive characters in the cast that constitutes the subject of economic analysis” (Baumol, 1968: 64). Since then, and over the past five decades,

5Some have argued that, even though the (concept of) entrepreneur may be of critical importance for growth and innovation, the problem is that it lacks operational definition and does not lend itself to fitting in an analytical tool like the neoclassical model (Bianchi & Henrekson, 2005).
a number of commentators (e.g., Audretsch, 2014; Ferrante, 2005) have given Baumol (1968) credit for highlighting the absence of the entrepreneur from the neoclassical firm, invoking his eloquent likening of the economic firm to the Shakespeare’s Hamlet without the Prince of Denmark (Hamilton, 2011). Scholars, however, remained divided over the impact Baumol (1968) had on economic thinking. Reynolds et al. (2005: 208) believe that, notwithstanding the thousands of citations to Baumol’s work, the fact remains that “neoclassical economic models still do not take explicit account of the entrepreneur and entrepreneurial activity.” Parker (2009: 3), on the other hand, believes that while Baumol (1968) was right in criticizing economists for not writing entrepreneurship into their models, the entrepreneur is now very much a “distinctive economic actor” in the new theories and perspectives currently prevalent in the economic literature.

Baumol’s (1990) work on productive, unproductive, and destructive entrepreneurial activity has left a strong legacy (Griffiths, Kickul, Bacq, & Terjesen, 2012; Padilla, 2016), inspiring a “significant amount of research” and drawing an impressive body of citations (Minniti, 2016: 2015).6 Baumol’s (1990) original idea, subsequently expanded by him and other scholars (e.g., Baumol, 1993; Boettke & Coyne, 2003), was that entrepreneurship exists in (one form or another) every society, so that what differs across societies is not the degree of the underlying entrepreneurial talent, but how it is channeled or allocated among competing choices. In some societies, creative individuals are more likely to devote their efforts toward private sector wealth creation (productive entrepreneurship); in other societies, individual labor efforts may be more concerned with securing wealth redistribution through the political and legal processes (unproductive entrepreneurship) or criminal activities.

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6It was republished in 1996 in the *Journal of Business Venturing*, widely considered the top journal in entrepreneurship research (Stewart & Cotton, 2013). To celebrate the 25-year anniversary of the publication of Baumol (1990), a mini-symposium was organized at the 2015 annual meeting of the *Southern Economic Association* where several prominent scholars presented their research exploring specific themes from Baumol’s seminal article. Selected papers from the conference symposium were published in a special issue of the *Journal of Entrepreneurship and Public Policy* (Padilla, 2016). McCaffrey (2018: 179) considered it a “landmark article” that was influential “across the social sciences and management disciplines,” and it was included in a selective list of “classic articles” in entrepreneurship with “an enduring impact on the field” (Gupta, Guo, & Ozkazanc-Pan, 2018: 5).
(destructive entrepreneurship). Individuals prioritize where to target their efforts based on the rate of return to different types of activities, which is influenced by the institutional environment of their society. Thus, whether enterprising individuals will use their talents to create wealth as opposed to consuming or destroying wealth will depend largely on the incentives they face (Padilla, 2016), so that it is useful for researchers and policymakers to focus on the ‘rules of the game’ within which entrepreneurs operate.

A detailed discussion of Baumol’s many publications is virtually impossible within the constraints of a part-chapter in a book, but a few other notable contributions of his work are worth discussing here. First, Baumol distinguished between replicative (or ‘firm-organizing’) entrepreneurs and innovative (or ‘Schumpeterian innovating’) entrepreneurs, acknowledging that while the bulk of the entrepreneurial activity in society is associated with the former, it is the latter that drives economic growth in a modern society (Griffiths et al., 2012). Innovative entrepreneurs introduce products and production techniques not available before, and replicative (or imitative) entrepreneurs help diffuse innovative products and techniques after they have already been introduced. Second, Baumol (2010) identified four key pillars of a vibrant entrepreneurial economy: (a) starting a business should be relatively easy (i.e., ease of doing business should be high); (b) socially useful entrepreneurial activity should be respected and rewarded in society (i.e., entrepreneurship should be seen as socially desirable); (c) activities that divide the economic pie, rather than expand it, should be discouraged; and (d) successful entrepreneurs and large established companies should be incentivized to innovate and grow further. Third, Baumol (with his colleagues) distinguished among four basic forms of capitalism (Baumol, Litan, & Schramm, 2007), an intriguing distinction that has gone largely unnoticed in the entrepreneurship literature: (a) state-guided capitalism where the government steers the market and decides which industries and firms deserve support (e.g., most countries in Southeast Asia), (b) oligarchic capitalism where power and wealth are concentrated with a small group of individuals and families (e.g., countries in Latin America and the Middle East), (c) corporate capitalism where giant enterprises carry out the most substantive economic activities (e.g., Continental Europe, Japan, and Korea), and (d) entrepreneurial capitalism where small, innovative firms are front and center (e.g., US).
Endres and Woods (2006: 189) believe it was “sheer ‘hyperbole’ for Baumol (1968: 66–67) to claim that in the ‘neoclassical model’ the ‘theoretical firm’ is entrepreneurless.” So, is it really true that the entrepreneur has been absent from traditional economic thinking? Baumol (1993) himself acknowledges that it is the innovative entrepreneur, not the replicative or imitative entrepreneur, who is really missing from conventional economic models of the firm. As Baumol (1968) observed, “one hears of no...brilliant innovations, of no charisma, or any of the other stuff of which entrepreneurs are made.” However, is it fair to criticize economics for ignoring the innovative entrepreneur, when such a character “is doomed to be absent from all scientific theories, economic or otherwise” (Parker, 2009: 4)? Moreover, even though more than five decades have passed since Baumol’s (1968) seminal observation regarding Hamlet without the Prince of Denmark, entrepreneurship remains missing from college-level economics texts (Johansson, 2004; Kent, 1989), so that generations of students continue to graduate with an incomplete understanding of the economics process (Kent & Rushing, 1999).7

Over the years, Baumol’s (1990) trichotomy of productive, unproductive, and destructive entrepreneurship has come under criticism from several quarters (McCaffrey, 2018). While Baumol (1990) assumed that the institutional environment is exogenously determined, others have argued that entrepreneurs can also alter the institutional setup as enterprising individuals are not passive or helpless with regard to the ‘rules of the game’ (Acemoglu, 1995; Henrekson & Sanandaji, 2011). In other words, instead of assuming that entrepreneurs simply react to the institutional environment as Baumol (1990) did, many scholars seek to explain how entrepreneurs act to change the institutions they find constraining or limiting (Greenwood & Suddaby, 2006; Hardy & Maguire, 2008). Davidson and Ekelund (1994: 269–270) criticize Baumol (1990) for assuming that the “rules of the game - including a system of property rights - must be exogenous determinants of economic outcomes,”

7Phipps, Strom, and Baumol (2012: 60–61) reviewed eight introductory entrepreneurship texts and found that three of them—specifically, Baumol and Blinder (2009), McConnell and Brue (2008), and Samuelson and Nordhaus (2010)—provide “enhanced discussion of the role of entrepreneurs and innovation in the economy and offer a more robust understanding of the importance of entrepreneurship to economic growth.” It is possible that the Prince of Denmark is getting increased attention by economists, but the jury is still out on this issue.
which they believe impose a “static, temporal conception of economic efficiency” at odds with historical trends. Douhan and Henrekson (2010) distinguish between business and institutional entrepreneurship to argue that in focusing on institutions as allocative mechanism, Baumol (1990) overlooks that institutions can themselves become targets of entrepreneurial innovativeness. Furthermore, researchers have also questioned Baumol’s (1990) very conception of productive entrepreneurship (Lucas & Fuller, 2017) and the ambiguous demarcation between unproductive and destructive entrepreneurship (Desai & Acs, 2007).

Baumol et al. (2007) proposed a four-pronged classificatory schema for identifying a country’s form of capitalism: state-guided capitalism, oligarchic capitalism, corporate capitalism (or, in their words, big-firm capitalism), and entrepreneurial capitalism. Over the years, other typologies of capitalism have also been developed (e.g., Bresser-Pereira, 2012; Rajan & Zingales, 1998), so that there exist several competing classification schemes for organizing the vast heterogeneity of capitalist systems in the world (Witt & Jackson, 2016). Baumol et al. (2007)’s typology is quite appealing, but its practical usefulness in actually classifying countries is murky at best. Consider, for example, the issue surrounding categorizing US into one of the four archetypes. Baumol et al. (2007) consider US to be a prominent (perhaps, even the solo) example of entrepreneurial capitalism, but then they also classify it as corporate capitalism (for the dominant role played by large firms) and also state-guided capitalism (particularly, the agriculture, energy, and housing sectors). One may also associate the US with oligarchic capitalism, particularly if one goes by the Gini coefficient, an important indicator of wealth and income inequality, as Baumol et al. (2007) did. The World Bank puts the Gini coefficient for US at 41.5, which is in close proximity to countries like Argentina, Uruguay, and Ecuador, generally considered examples of oligarchic capitalism. The classification of other major economies using the Baumol et al. (2007) scheme is also problematic. For example, commentators and experts alike often classify China as an example of state-guided capitalism (Page, 2019), but it also has some features of oligarchic capitalism (e.g., informality and corruption), corporate capitalism (powered “more by certain national champion firms”), and entrepreneurial capitalism. A similar case may be made for India, with its middling Gini coefficient (.35), informality and corruption, large firms (with the maharatna and navratna companies), and millions of entrepreneurs running small firms. The validity and usefulness of Baumol et al.’s (2007) schema are therefore a worthwhile area for future research.
ISRAEL KIRZNER: AN AUSTRIAN POSITION

Israel Kirzner, the 2006 GAER awardee, was recognized his outstanding role in “developing the economic theory emphasizing the importance of the entrepreneur for economic growth and the functioning of the capitalist process.” Ricketts (1992: 67) noted that “no other economic theorist has devoted more attention to the role of the entrepreneur in economic life than has Israel Kirzner,” an observation that resonates well with many scholars (especially those subscribing to the Austrian school). His most recent work, Kirzner (2019), critiques Nobel laureate Milton Friedman’s universal ethic for profit (the much-discussed idea that the only social responsibility of business is to increase profits for its shareholders).

During his Ph.D. days, Kirzner wrote The Economic Point of View: An Essay in the History of Economic Thought for his dissertation (see Kirzner, 1960). For many scholars (e.g., Boettke, 2017), Kirzner’s work on the entrepreneurial market process theory is deserving of the Nobel Prize for it helped explain how the economic system moves from disequilibrium to equilibrium (see Kirzner, 1963, 1973, 1992). Jakee and Spong (2003: 461) believe that Kirzner “has promoted the role of the entrepreneur more than any other author in the second half of the twentieth century.” Kirzner (1973) is widely considered “the seminal modern Austrian statement on entrepreneurship” (Foss & Klein, 2010a: 105), and Kirzner frequently returned to the ideas discussed therein (Kirzner, 1979, 1992, 2009), including applying them to other areas such as regulation (Kirzner, 1985) and ethics (1989).

To grasp Kirzner’s contributions, it is useful to first briefly understand Austrian economics and how it relates to entrepreneurship. The term ‘Austrian economics’ refers to a heterodox school of thought that

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8Kirzner (1960) was critical of Robbins’ (1932) view of economics as the “science which studies human behavior as a relationship between ends and scarce means which have alternative ends.” Kirzner believed that Robbin’s definition limited economics to mechanical means-end calculus and overlooked purposeful human action. He argued that Robbins’ conception of the homo economicus mechanically applying given means to best satisfy, although conflicting, is not able to accommodate the discovery of new means and ends and the new alignments between means and ends. This does not, however, mean that Kirzner rejected all of Robbins’ ideas as is clear from his 2010 June and Edgar Memorial Lecture (see Kirzner, 2011).

9Kirzner’s first published work related to entrepreneurship may have been Kirzner (1971).
originated with Carl Menger in Vienna and continued over the years through his disciples, including Ludwig von Mises and Nobel laureate Friedrich Hayek (Jacobson, 1992). Vaughn (1998) identified three core Austrian tenets: (a) socioeconomic phenomena should be explained in terms of ideas and actions of individuals (i.e., methodological individualism), (b) people respond to their subjective interpretation of the environment within which they operate, and (c) humans think and act in time and always under conditions of limited knowledge of the present and uncertainty about the future. While all Austrian scholars generally agree with these propositions, there is stark disagreement on their implications. A large group of Austrians believe that Austrian insights are a vital supplement to neoclassical economics, and as often articulated in the writings of Kirzner, wants the focus of economic theorizing to be on the market processes that lead to equilibrium. A much smaller group of Austrians, and as reflected in the work of Ludwig Lachmann (who was Hayek’s student), argue that taking time and ignorance seriously means abandoning the notion of equilibrium and making a clean break from neoclassical economics (Chiles, Bluedorn, & Gupta, 2007).

Kirzner believed that key concepts in the Austrian tradition—specifically, subjectivity and ignorance—are basic building blocks for a theory of entrepreneurship. Kirzner’s embrace of these fundamental Austrian concepts led him to deny the neoclassical notion of the economy existing in a state of equilibrium characterized by perfect information, perfect competition, and perfect coordination. For Kirzner (1997a), the main attraction is actually the dynamic competitive processes that push an economy toward equilibrium. Because entrepreneurs alter the means and ends in a given situation, they are the drivers of Kirzner’s equilibrating forces. Entrepreneurship, in other words, exists in an out-of-equilibrium world and is continually driving the system toward equilibrium.

The key entrepreneurial attribute in Kirzner’s theory is ‘alertness,’ which involves being alert to hitherto unnoticed opportunities. It is alertness that gets individuals to make discoveries that help satisfy human needs and wants. Kirzner (1979: 48) defined alertness as “the ability to notice without search opportunities that have hitherto been overlooked.” At other times, Kirzner variously described alertness as “an

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10 Foss and Klein (2010a: 98) believe that Kirzner’s work “can trace its roots back to Richard Cantillon, J. B. Clark, Frank A. Fetter, and other writers,” but they do not explain the specific linkages that led them to this inference.
attitude of receptiveness to available, but hitherto overlooked, opportunities” (Kirzner, 1997a: 72) and “a sense of what might be ‘around the corner,’ i.e., the sense to notice that which has hitherto not been suspected of existing at all” (Kirzner, 2009: 151). Kirzner (1973) uses the analogy that the entrepreneur is one who, upon seeing a $10 bill in front of him, becomes alert to its existence and acts to grab it. The alert person grabs the $10 bill quickly; the less alert will take longer to see the $10 bill and to grab it. Thus, at a basic level, Kirzner’s entrepreneur is an arbitrageur who finds a gap or mismatch across different markets and then moves to fill that gap (through buying low and selling high). In Kirzner’s framework, alertness is not the equivalent to search, which involves a deliberate exploration of new information. For Kirzner, alertness is about discovering something that one had not even been considered earlier. The discovery of a Kirznerian profit opportunity, which can range from a ten-dollar bill on the street to a pill for curing cancer, is “necessarily accompanied by the element of surprise - one that had not hitherto realized one’s ignorance” (Kirzner, 1997a: 62).

Seemingly simple and elegant, Kirzner’s view of entrepreneurship has attracted criticism not only from the radical Austrians who take a puritanical view of the Austrian concept of subjectivity (Vaughn, 1992), but also “even from like-minded travelers” (Jakee & Spong, 2003: 461). Rothbard (1985: 282) considered Kirzner’s entrepreneur “a curious formulation,” which is particularly notable because Murray Rothbard was another prominent member of the Austrian school. Kirzner has been criticized for ignoring entrepreneurs’ need for capital to exploit opportunities (Chiles et al., 2007). Like Schumpeter, Kirzner too distinguished sharply between capitalists and entrepreneurs, arguing that pure entrepreneurship requires no capital. Kirzner insists that the pure entrepreneur neither owns nor invests. For Kirzner, entrepreneurs perform only the discovery function, so that they are spontaneously alert to profit opportunities, and do not own or invest capital. Kirzner (1973: 47) lays out this position:

Ownership and entrepreneurship are to be viewed as completely separate functions. Once we have adopted the convention of concentrating all elements of entrepreneurship into the hands of pure entrepreneurs, we have automatically excluded the asset owner from an entrepreneurial role. Purely entrepreneurial decisions are by definition reserved to decision-makers who own nothing at all.
Critiquing Kirzner’s position that the entrepreneur only performs the discovery function and nothing else (Foss & Klein, 2010b), Rothbard (1985: 282) writes:

Kirzner’s entrepreneur… need not, apparently, risk anything. He is a free-floating wraith, disembodied from real objects. He does not, and need not, possess any assets. All he need have to earn profits is a faculty of alertness to profit opportunities. Since he need not risk any capital assets to meet the chancy fate of uncertainty, he cannot suffer any losses. But, if the Kirznerian entrepreneur owns no assets, then how in the world does he earn profits? Profits, after all, are simply the other side of the coin of an increase in the value of one’s capital; losses are the reflection of a loss in capital assets. The speculator who expects a stock to rise uses money to purchase that stock; a rise or fall in the price of stock will raise or lower the value of the stock assets. If the price rises, the profits.

Kirzner has also received considerable criticism for his understanding of the role of equilibrium. Keyhani and Levesque (2016: 67) define equilibrium as “a situation in which agents…have exploited all opportunities available to them.” Of course, many other definitions of economic equilibrium exist, including the familiar idea of a balance between the forces of demand and supply (Milgate, 1991). Kirzner, like most Austrians, subscribes to the idea that the natural state of the economy is not equilibrium, but disequilibrium.11 Yet, for Kirzner, the market is always moving toward equilibrium. In formulating his ‘tendency towards equilibrium’ argument, Kirzner seems to have been inspired by Adam Smith who saw equilibrium as a center of gravitation of the economic system—a particular configuration of values toward which all economic forces are “continually tending to confirm” (Milgate, 1991: 228). As Smith (1776: 65) wrote:

The natural price…is, as it were, the central price, to which the prices of all commodities are continually gravitating. Different accidents may sometimes keep them suspended a good deal above it, and sometimes force them down even somewhat below it. But whatever may the obstacles which

11 Schumpeter, on the other hand, adhered closely to the neoclassical equilibrium, so that his entrepreneurs—through the exploitation of new combination—disrupt prevailing equilibrium. In Schumpeter’s telling, entrepreneurs disrupt market equilibria time and again, as the next entrepreneur comes along with a new means-end combination to wake up the market from its slumber in equilibrium.
hinder them from settling in this centre of repose and continuance, they are constantly tending towards it.

Entrepreneurial actions fix errors and remove inefficiencies, closing pockets of ignorance in the market, which then ignites and reinforces a tendency toward equilibrium. As Klein (2008: 180) observes, Kirzner's entrepreneurial discovery is "simply that which causes markets to equilibrate." Ludwig Lachmann and his Austrian disciples, often labeled as the 'radical subjectivists' (Vaughn, 1998), contend that the overall tendency of the market process cannot possibly be toward equilibrium. Their argument is based on extending the Austrian notions of subjectivity from knowledge (or information) to expectations: market activity results from the aggregation of subjectively formed expectations of numerous individuals. Because of the subjectivity inherent in individual expectations, Lachmann argues, it makes no sense to think of equilibrium either within specific markets (e.g., automobiles, personal computers) or between markets, so that the idea of a general tendency toward a general state of equilibrium is indefensible.12 To quote Lachmann (1976: 131), "no initial set of forces delimits the boundaries of events. Any force from anywhere may at any time affect our process, and forces that impinged on it yesterday may suddenly vanish from the scene. There is no end or final point of rest in sight."

Kirzner is largely dismissive of subjectivism's application to expectations and the disequilibration it portends. He claims that a key normative requirement for entrepreneurship theory is to illuminate how unintended social outcomes like market coordination occur from individual action. To make his point, Kirzner (1960) brings up the issue of how the "great city of Paris is provided with colossal quantities of food and other articles" in the absence of any central agency managing the flows of different materials. "Paris," Kirzner (2009: 150) famously observed, "does get fed." In Kirzner's framework, the flow of all the goods that a metropolis like Paris needs to sustain its population is an example of the overall coordinative thrust of the market process (Prychitko, 1997). Radical subjectivism with its emphasis on "indeterminacy and unpredictability inherent in human

12 For more on the 'radical subjectivist' strand of Austrian economics, particularly as it applies to entrepreneurship, see Chiles, Vultee, Gupta, Greening, and Tuggle (2010), Chiles, Tuggle, McMullen, Bierman, and Greening (2010), and Chiles, Elias, Zarankin, and Vultee (2013).
preferences, human expectations, and human knowledge,” Kirzner (1976: 42) argues, is unable to explain market coordination.

For entrepreneurship scholars, an important critique of Kirzner centers around his argument that entrepreneurs can only discover existing opportunities and not create opportunities ex-nihilo (Vaughn, 1998). Entrepreneurial opportunities, Kirzner (2009: 150) argued, are “waiting to be grasped.” Kirzner (1997b: 4) goes as far as to argue that “we have to recognize that when an innovator has discovered something new, that something was metaphorically waiting to be discovered.” Scholars building on Kirzner’s work have come to see entrepreneurial opportunities as existing in the environment due to changes in technology, consumer preferences, or other attributes of the market or industry context (Shane & Venkataraman, 2000), which are discovered by ‘alert’ entrepreneurs who then take appropriate action to exploit them based on their prior knowledge (Shane, 2000). In contrast to the Kirznerian discovery view, some researchers have advocated a creation perspective that sees opportunities as actively constructed by ‘imaginative’ entrepreneurs (Alvarez & Barney, 2007; Chiles et al., 2007) or ‘willed into being’ by creative visionaries (Sarasvathy, 2001). From a creation standpoint, opportunities are “an image in the entrepreneur’s mind” (Penrose, 1959: 42) that are then actualized through the interactions between entrepreneurs, other economic actors, and their environments (Aldrich & Kenworthy, 1999). Recognizing the creationist criticism of his work, Kirzner (1985) made some efforts to incorporate imagination and vision into his theory, but it proved dissatisfying to his critics (Gloria-Palermo, 2002).

**Josh Lerner: Entrepreneurship and Finance**

The 2010 GAER awardee, Josh Lerner, was recognized for his “pioneering research into venture capital (VC) and VC-backed entrepreneurship” and many contributions to “the synthesis of the field of finance and entrepreneurship in the form of entrepreneurial finance.” As Cumming and Groh (2018: 539) explained, entrepreneurial finance is “an interdisciplinary field that covers work in finance and entrepreneurship (including entrepreneurship and management journals).” Academics have traditionally conceived of entrepreneurial finance as a relay race, where initial funding from family, friends, and fools gives way to business angels, after which the baton is handed over to VC before the initial
public offering (IPO) occurs to provide an exit opportunity for investors and allows entrepreneurs to raise more capital (Harrison & Mason, 2019).

Lerner’s research can be broadly divided into three areas: (i) venture capital, private equity, and entrepreneurial finance (e.g., Gompers & Lerner, 2001); (ii) intellectual property and innovation (e.g., Brunt, Lerner, & Nicholas, 2012; Lerner, 1997); and (iii) strategic alliances or other hybrid organizational forms (e.g., Lerner & Malmendier, 2010). Over the years, Lerner has also authored several books, starting with Gompers and Lerner (1999), and perhaps most notably, the award-winning, Lerner (2009). Among the academic community, Lerner is best known for his work on VC and entrepreneurial finance, with a reputation as “one of the world’s leading authorities in this area” (Braunerhjelm & Parker, 2010: 246). Cumming, Deloof, Manigart, and Wright (2019) classified research on entrepreneurial finance into four categories: entrepreneurs or the entrepreneurial firm, organizations providing finance to entrepreneurs (e.g., venture capital firms), organizations that provide funds to financiers of entrepreneurial firms (e.g., pension funds), and the region or country within which entrepreneurial firms or their investors are embedded. Lerner’s research, primarily the focus on VCs, falls squarely within the stream of research dealing with individuals and firms providing financing to entrepreneurs.

Simply stated, VCs are wealthy private equity investors willing to provide capital to companies with high growth potential in exchange for equity stake. Kortum and Lerner (2000: 676) define VC as “equity or equity-linked investments in young, privately held companies, where the investor is a financial intermediary who is typically active as a director, an advisor, or even a manager of the firm.” VCs raise funds from a set

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13Lerner’s frequent co-author on VC research is Paul Gompers, one of the three most highly cited researchers in this area of academic inquiry (Cornelius & Persson, 2006). One way to study who is publishing in a particular area such as VCs and their influence on the discipline is bibliometrics, which uses statistical models to assess research based upon keyword analysis, citations, affiliations, and other relevant information available in library databases (Cancino, Merigo, Torres, & Diaz, 2018). Bibliometric analysis of 128 published papers on VCs reveals that Lerner is “quite central” to academic conversation in this area (Cornelius & Persson, 2006: 145), with only William Sahlman, Paul Gompers, and William Bygrave cited more often.

14The journal Venture Capital, launched in 1999, focuses on research related to VCs in particular, and entrepreneurial finance in general (Harrison & Mason, 1999).
of limited partners, with the goal of providing a return through selective investments into a portfolio of young, innovative companies (Yahoo, EBay, Amazon, are prominent examples of VC success stories). VC firms tend to be small and geographically clustered, often participating in deals mid-stage to late stage (Drover et al. 2017), continuing to larger and later-stage investments (Hellmann & Thiele, 2015). Because limited partners expect to get returns on their VC investments within 10 or so years, there is often a focus on realizing timely exits via an acquisition (i.e., accepting a buyout from another company) or initial public offering (IPO, where the company issues shares to the public).

Gompers and Lerner (2001) identify Boston-based American Research and Development (ARD) as the first true venture capital firm in the country. The firm, set up as a publicly traded closed-end fund, made high-risk investments in emerging companies that employed technology developed for the Second World War. After the Soviet launch of the Sputnik satellite, and spurred by fears of lagging American technical competitiveness, the Eisenhower administration introduced the Small Business Investment Act in 1958 to encourage the development of the VC industry. The act allowed for applicants who had secured a small amount of private capital to received generous marching funds from the government (see Noone & Rubel, 1970 for a detailed discussion). Corruption followed, as unscrupulous operators invested either in firms with poor prospects or in fraudulent endeavors, typically with friends or relatives running the show.

Around the same time, in 1958, the first venture capital limited partnership, Draper, Gaither, and Anderson, was formed, raising capital from a small set of investors compared to more loosely regulated closed-end funds. A few other venture funds were established in subsequent decades, but until the late 1970s the flow of money into new venture funds never exceeded a few hundred million dollars annually in the best years (Kortum & Lerner, 2000). During this period, institutional investors generally shied away from investing in VC funds. However, the 1979 amendment to the ‘prudent man’ rule governing pension fund investment drastically changed the landscape, as pension managers were explicitly allowed to invest in high-risk assets, including venture capital, under the new regulatory regime. VC investments increased to more than $4 billion in the mid-1980s, with upward of half of all contributions coming from pension funds. The second half of the 1990s saw another leap in VC activity, which now emerged as the dominant form of equity financing in the
US for privately held high-technology businesses, more than half of it going to information technology industries, especially communications and networking, software, and information services (Gompers & Lerner, 2001).

Lerner (1995) contends that VCs acquire in-depth knowledge of the firms they finance, in part because they have greater—and more proximal—access to the internal dynamics of the firm. Consequently, VCs serve an important oversight function in private firms. This was not an original insight into VC activities. In response to the question “What do venture capitalists do?” Gorman and Sahlman (1989) noted that VCs spend about half of their time monitoring portfolio firms. Using the VC financing database assembled by Venture Economics (cf. Lerner, 1994), Lerner (1995) examines changes in board membership around CEO turnover in 271 biotechnology firms receiving VC funding between 1978 and 1989. Two interesting findings emerge: (a) as expected, VC board representation increases significantly between financing rounds when the firm’s CEO is replaced in the interval than between other rounds (on average, 1.75 VC directors are added around CEO replacement versus 0.24 VC directors without CEO replacement); and (b) VC directors are twice more likely to come from funds with offices within 5 miles of the firm’s headquarters than from 500 miles distance, which is attributed to transaction costs associated with frequent visits and intensive involvement required to provide effective oversight.

Does VC funding enhance technological innovation? Innovative activities are difficult to finance in competitive markets because of challenges associated with preventing knowledge from diffusing in the industry (Hall & Lerner, 2010). Kortum and Lerner (2000) examined the role of VC in encouraging innovation in twenty manufacturing industries between 1965 and 1992. Innovation is captured using information on US patents issued to inventors. Data on VC funding came from Venture Economics database (cf. Lerner, 1994) and industrial R&D expenditure from the Natural Science Foundation (NSF). Accounting for industry- and time-fixed effects, Kortum and Lerner (2000) find that R&D and VC funding together explain over one-fourth of the variation in log of the number of patents issued to inventors.

\[15\] Much of the early academic literature on VC funding was based on either primary field research or archival data from Venture Economics (Drover et al., 2017). In 1991, Securities Data Company acquired Venture Economics, reintroducing it as SDC Venture Intelligence Database.
The potency of VC funding was estimated to anywhere from seven to 40 times that of corporate R&D investment in stimulating patenting. Large established firms prefer internal funds for financing R&D, while small and new firms benefit from the presence of VCs. However, VCs are not always a good solution to the funding gap, especially when public equity markets for VC exist are underdeveloped in a country (Hall & Lerner, 2010).

The problem with linking VC funding with innovation is endogeneity, which is the possibility that a predictor is correlated with the error term (also known as “disturbance” or “residual”) in an ordinary least squares (OLS) regression model (Semadeni, Withers, & Trevis Certo, 2014). If causality runs from innovation to VCs (as Geronikolaou & Papachristou (2012) found in Europe), then the variable capturing VC investment is endogenous and correlated with the contemporaneous error term. Another concern is the possibility of autocorrelation in modeling the impact of VC investment on innovation outcomes (Faria & Barbosa, 2014). One way to establish causal inference about the association between VC funding and the innovativeness is to use an ‘exogenous shock’ that affects all firms (Gupta, Mortal, Chakraborty, Guo, & Turban, 2020). An exogenous shock is akin to an experimental treatment, which enables a before-and-after analysis, with each firm acting as its own control for characteristics consistent across time (Ketokivi & McIntosh, 2017). Because there is no random assignment, the design may be considered a quasi-experiment (Cook & Campbell, 1979). Such models can be very effective in making causal claims (Antonakis, Bendahan, Jacquart, & Lalive, 2010) if there are meaningful exogenous shocks that have an impact of theoretical interest (Ketokivi & McIntosh, 2017). Kortum and Lerner (2000) exploited, as an exogenous shock, the 1979 ‘prudent man’ policy shift that freed pensions to invest in VCs. The underlying logic was that such an exogenous change should help causally identify the role of venture capital, because it is unlikely to be related to the arrival of entrepreneurial opportunities in the industry.

Does the government play a role in financing new ventures? Despite considerable academic interest in the interactions between government and business, the direct public subsidization of new ventures has received

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16 Successful patent applications capture patents granted, which Faria and Barbosa (2014) consider proxy for innovative output.
scarce research over the years (Malmström, Johansson, & Wincent, 2017). There is also a widespread misconception that private businesses do not receive public funds in the US. Contrary to popular belief, public funding for small and new ventures has a long history in the US. Indeed, many marquee American firms, like Apple and FedEx, received financial support through federal programs for private companies. One such program was the Small Business Innovation Development Act, enacted by Congress in July 1982, which established the Small Business Innovation Research (SBIR) program. In its original form, SBIR mandated all federal agencies with more than $100 million annual spending on external research to set aside 1.25% of their funds for small businesses. Later, Congress increased the set-aside to 2.5% (in 1992), which now stands at 3.2% (since 2017). Using a dataset of SBIR award recipients generated by US Government Accountability Office (GAO), and matching it with similar firms that did not receive the award,17 Lerner (1999) found that awardees grew significantly faster than matched firms, though this difference was driven primarily by firms in the top one-third of the distribution. The awardees were also more likely to attract private venture financing (if the firm was in a region with high VC activity), and that the effect was strongest in technology-intensive industries (defined as high ratio of (a) intangible assets to total assets and (b) R&D spending to total sales. SBIR awards, however, may dampen R&D spending by the firm itself and not increase employment (Wallsten, 2000).

Gompers and Lerner (2001) sought to synthesize the existing empirical VC research, which had emerged as an “important area” for systematic research in the last two decades of the last century, but where academic inquiry lagged behind the actual development of the industry in the real world (Wright & Robbie, 1998: 521). At the time, total VC investments in the US were about $67 billion (in 2018, it was about $120 billion),18 with a little more than one-third of VC funds concentrated in California. Annual inflows into venture funds had expanded from virtually zero in the mid-1970s to $105 billion in 2000 (Gompers & Lerner, 2004). Academic work on VCs during the 1980s and 1990s tended to be descriptive of how

17 Two matching samples were created: one was matched on industry and firm size, and another on geographic location and firm size.

18 Globally, VC investments were about $250 billion in 2018.
the investment process worked and the role of key players (Drover et al., 2017).

Tyebjee and Bruno (1984) identified five sequential steps in VC investment activity: deal origination, deal screening, deal evaluation, deal structuring, and post-investment activities. Accordingly, Gompers and Lerner (2001) advocated a ‘venture cycle’ view, starting with raising a venture fund, proceeding through investing in, monitoring of, and adding value to firms, continuing as the venture capital firm exits successful deals and returns capital to its investors, and finally strategic renewal with the raising of additional funds for future investments. Researchers generally focused on issues raised within individual stages of VC cycle, ignoring the dynamic inter-linkages between the various stages, such as the possibility that sometimes VCs may seek to reinvest in enterprising actors who have exited from their existing portfolios (Wright & Robbie, 1998). Gompers and Lerner (2001) highlight three key gaps in academic understanding of what was then a ‘young’ industry. First, it is commonly believed that the returns to institutional investors from VC funds are largely uncorrelated with the public markets, but the validity of this belief is an empirical issue that should not simply be assumed. Second, much of VC activity is concentrated in the US, which raises questions as to why this is the case and what (if anything) can be done about it. Finally, after endogeneity concerns have been considered, does VC funding still have a real effect on corporate and economic outcomes after accounting?

Lerner’s most cited work so far is Lerner and Tirole (2002), which is unrelated to VC research. Lerner and Tirole (2002) are interested in an altogether different question: Why do programmers, including top-notch coders, contribute freely to the development of open-source software, a public good? Notably, and as suggested by Pareto’s law, the top two deciles of contributors account for about 80% of code contributed to open-source projects. Using four ‘mini-cases’—Apache, Linux, Perl, and Sendmail—and drawing on economic logic, Lerner and Tirole (2002) explain that people participate in open source because of ego-gratification or career concern incentives. A major attraction of open-source projects for developers is its modularity (which allows tasks to be divided into small blocks) and its perceived enjoyment (challenges are fun to pursue). Having a leader—someone who in the beginning tends to contribute

19 Gompers and Lerner (1999) provided a book-length discussion of the VC cycle, subsequently expanded in Gompers and Lerner (2004).
heavily, but gradually transitions to ‘holding things together’—helps attract other programmers to the project.

There is no doubt that VCs have had a transformative impact on the modern entrepreneurial landscape. Consider that more than half of IPO firms in any given year now are VC-backed. Gornall and Strebulaev (2015) observe that public firms that previously received VC backing account for one-fifth of the market capitalization and 44% of R&D spending of US public companies. Not surprisingly, VCs have drawn more research attention than any other form of financing for entrepreneurs. Despite funding only a small fraction of start-ups, VC tends to be the most widely recognized form of financing (Drovers et al., 2017). Estimates suggest that, in the US, less than one-quarter of 1% of companies receive VC financing. As a financial intermediary, the VC industry is “modestly sized” and much smaller than other intermediaries such as mutual funds (Gompers & Lerner, 2004: 5). A large proportion of start-up financing in the US is through external debt, including debt financed through the personal balance sheets of the entrepreneur (Robb & Robinson, 2014). Although the proportion of firms that benefit from VC funding is quite small, VC financing was the most popular research area in entrepreneurial finance from 2000 to 2016 (Cumming & Groh, 2018).

In 1996, the pool of VC funds in the US was about three times larger than 21 other high-income nations put together (Jeng & Wells, 2000). Moreover, at the time, 70 percent of the VC funds in the rest of the world were in three countries with especially strong ties to the US: Israel, Canada, and Netherlands (Gompers & Lerner, 2001). Over the next two decades, VCs became globally popular, so that by 2018, the VC industry in the US was about half the global market. International institutions such as the World Bank played a prominent role in the globalization of the VC industry, facilitating the sharing of experience and knowledge from the US to other countries seeking to develop their own VC community (Harrison & Mason, 2019). VCs are now a well-established financial intermediary in Singapore, Taiwan, and Hong Kong. VC investments are growing in popularity in former centrally planned

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Cumming (2014: 251) observes that “VC investment returns in the past decade have been on average negative in the US,” with the Great Financial Crisis making matters worse for VCs trying to raise funds and entrepreneurs vying to raise capital. The COVID-19 pandemic is likely to also have a negative impact on VC investments.
economies of Central and Eastern Europe, including Hungary and Poland as well as rapidly emerging major economies like China and India (Wright, Pruthi, & Lockett, 2005). Academic research (partly) reflects the growing global popularity of VCs. By one estimate, more than half of VC research now takes place outside North America (Cornelius & Persson, 2006). However, even internationally, VC research is concentrated largely in the EU countries, with much less consideration to VCs in other parts of the world.

**Summary**

Entrepreneurship is widely viewed as an important stimulus for positive outcomes from the micro (individual)-level to the macro (society)-level. Researchers from a variety of scholarly disciplines—economic, sociology, and psychology, for sure, but also anthropology, marketing, and finance, among others—are interested in exploring research questions that speak to the “eclectic and pervasive benefits” of entrepreneurship (Ireland & Webb, 2007: 891). This chapter discusses the work of four GAER awardees—namely, Howard Aldrich, William Baumol, Israel Kirzner, and Josh Lerner—all of who drew upon the rich literatures in their discipline to study entrepreneurship questions. They used the theoretical frameworks and methodological toolkits from their disciplinary training to study important questions of interest to entrepreneurship scholars. In doing so, they advanced the knowledge frontier of their discipline and enriched research in entrepreneurship.

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