



The Legacy of Zoltan J. Acs

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Plain English Summary This paper reviews the scholarly contributions of Zoltan J. Acs, who served as a Co-Founder and Co-Editor in Chief since the inception of *Small Business Economics*. His scholarship serves as one of the foundations and cornerstones of the field of entrepreneurship. His contributions range from innovation to philanthropy and national systems of entrepreneurship.

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“Good papers either end debates or start them,” Zoltan used to say. He should know. He had his share of both. Shortly after we met in 1980, we would hike the Green Mountains of Vermont, which served as a natural catalyst for reflecting upon the most compelling issues of the day. It was during such a hike that he first spoke of his Ph.D. thesis as a blueprint for reigniting the U.S. economy after a shocking loss of competitiveness and global supremacy. The intellectual communities in economics and management were desperate for solutions to the unforeseen demise in industry after industry that had previously been the backbone and pride of American manufacturing prowess. When Zoltan revealed his solution, as we ascended the summit of Mount Abraham, I was as startled as I was skeptical—small business. In an era where the great scholars and thought leaders in economics and management assumed that size and scope

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were commensurate with productivity, efficiency, growth, and competitiveness (Chandler, 1977 and 1990; and Scherer, 1970), Zoltan seemed to be looking in the wrong place. It turned out he was looking in exactly the right place.

As a deluge of foreign competition wreaked havoc on the steel industry, Zoltan, in his remarkably original and prescient Ph.D. dissertation, *The Changing Structure of the U.S. Economy: Lessons from the U.S. Steel Industry* (Acs, 1984), saw a glimmer of hope and optimism, where others succumbed to resignation and despair (Thurow, 1984 and 1987). His insight revolved around the small new entrants in the industry, referred to as the mini mills, which were thriving, even as the giant dominant corporations, such as U.S. Steel, Bethlehem Steel, and Youngstown Steel had been brought to their knees by foreign competition. The leading experts all focused on how to restore the competitiveness and viability of these one-time stalwarts of American manufacturing. This culminated with the dream team of scholars, the MIT Commission on Industrial Productivity, in their highly influential book, *Made in America: Regaining the Productivity Edge* (Dertouzos et al., 1989).

But Zoltan, true to his nature, saw things differently. As the eminent MIT economist Charles P. Kindleberger explains in his preface to Zoltan's book (Acs, 1984), Zoltan's focus on what had been ignored in the mainstream thinking and analysis—small firms—revealed that while the industrial giants were stagnating, the mini mills were boldly innovative.

A case study of one industry, however surprising and illuminating, does little to revolutionize thinking, particularly in an old and established academic discipline, such as economics. It was in Berlin, at the Institute of International Management, subsequently reorganized to constitute the now thriving WZB Social Science Center Berlin, that Zoltan undertook the breakthrough research, identifying small firms as being innovative, not just in a single industry context, but across a broad spectrum of industries and sectors.

In his 1911 classic treatise, *Theorie der wirtschaftlichen Entwicklung*, the giant of a scholar, Joseph Schumpeter, had emphasized the key role contributed by entrepreneurial startups in triggering a gale of creative destruction. According to Schumpeter (1911), new startups, infused with entrepreneurial spirit, would displace the entrenched and sluggish incumbents through a wave of relentless innovative

activity. As Scherer (1992, p. 1417) put it, “Schumpeter insisted that innovations typically originated in new, characteristically small, firms commencing operation outside the ‘circular flow’ of existing production activities. To be sure, the small innovating firms that succeeded would grow large, and their leaders would amass great fortunes. They started, however, as outsiders.”

However, half a century later, most scholars and thought leaders in business and policy had abandoned the idea that entrepreneurs in small new firms would serve as the engine of innovation. Rather, they looked to the large corporations as having the requisite organizational size, scale, resources, and capabilities to generate innovative activity (Chandler, 1977 and 1990; Scherer, 1970). As John Kenneth Galbraith (1952, pp. 86–87) concluded, “There is no more pleasant fiction than that technical change is the product of the matchless ingenuity of the small man forced by competition to employ his wits to better his neighbor. Unhappily, it is a fiction. Technical development has long since become the preserve of the scientist and engineer. Most of the cheap and simple inventions have, to put in bluntly and unpersuasively, been made.”

Schumpeter himself reversed his earlier 1911 view of the prominence and central role played by entrepreneurial startups in *Capitalism, Socialism and Democracy* (1942, p. 132), “Innovation itself is being reduced to routine. Technological progress is increasingly becoming the business of teams of trained specialists who turn out what is required and make it work in predictable ways.” Thus, Schumpeter (1942, p. 106) concluded that, “What we have got to accept is that (the large-scale establishment or unit of control) has come to be the most powerful engine of... progress and in particular of the long-run expansion of output not only in spite of, but to a considerable extent through, this strategy which looks so restrictive.”

The empirical evidence came down decisively on the side of Galbraith and Schumpeter—the large corporation clearly exhibited a greater propensity to innovate (Chandler, 1977 and 1990; Griliches, 1990; and Scherer, 1992). However, this conclusion had to be qualified with an important caveat. Measurement of innovative activity was highly limited in two important ways (Griliches, 1990; and Scherer, 1992). The first involved *what* was measured. Measurement

was restricted by the low-hanging fruit that generally involved knowledge inputs, such as research and development (R&D) expenditures or an intermediate knowledge output, such as the number of inventions receiving legal patent protection. As the giant of a scholar, Zvi Griliches (1990, p. 1669), famously queried, “Patents as indicators of what?” Neither R&D nor patents actually measure the elusive innovative activity, which seemed beyond the grasp of systematic research and empirical scrutiny.

The second caveat involved *who* was being measured as the source of innovative activity. In fact, virtually all measurement and data sets were limited to the largest companies (Griliches, 1990; and Scherer, 1992). Measurement is costly. Why would society invest scarce resources in measuring innovation from a source that the leading thinkers in economics and management had concluded did not matter—small firms? So, measurement remained restricted to innovative inputs in large companies.

And then Zoltan came along. He did not actually invest in rectifying these two fundamental measurement restrictions himself. But he knew someone who did, or rather, some agency that did—the U.S. Small Business Administration. Thus, Zoltan showed up in Berlin with the obscure and totally unknown first systematic measurement of innovative output spanning all firm sizes, enabling the study of what had previously eluded researchers as unmeasurable and therefore impervious to analysis. The result was the startling finding that, contrary to the widely accepted doctrine of Schumpeter, Galbraith, and other leading scholars of the day, in fact small firms exhibited a high propensity to innovate, at least in certain industry contexts (Acs & Audretsch, 1987, 1988 and 1990).

The new and unexpected finding that small firms were vital for innovation triggered a wave of research devoted to uncovering and deciphering the part of business and the economy that had largely been overlooked and neglected in the academic disciplines of sociology, psychology, economics, and management—small and new business. Coupled with another startling and unexpected finding by Birch (1981) that four out of five new jobs are created by small business, interest in this unknown but obviously highly fertile terrain exploded.

It may take a village to raise a child, but Zoltan knew that it takes a community to spawn and grow a new academic field. We created *Small Business Economics* in 1988 to do exactly that. I know that the premier issue, published in March of 1989, remains to this day one of Zoltan’s all-time favorites. It set a perfect tone for his vision—a journal that is inclusive, cross-disciplinary, but also adhering to the highest standards of scholarly craftsmanship and devoted to new ideas and insights concerning this new research area of small business. Small firms, and what would subsequently morph and coalesce into the broader sense and understanding of entrepreneurship, were simply too important to remain ignored on the academic sidelines. A star was born.

Meanwhile, back on the research front, the important new insights about the veracity of small-firm innovation seemed to raise more questions than provide answers. In particular, how could it be that small firms burdened by a paucity of knowledge inputs and resources could exhibit a high degree of innovative output?

Resolution to what became widely known as the Schumpeterian Paradox came from two unlikely sources. The first was from Paul Romer (1986 and 1990), who through his pathbreaking research on endogenous growth models, identified the key role played by knowledge spillovers. Romer, who was ultimately awarded the Nobel Prize in Economics, challenged the seminal insight from an earlier Nobel Prize winner, Robert Solow (1957), that knowledge falls like manna from heaven, suggesting that prayer might be the best policy approach to generating an inherently random and stochastic phenomenon. By contrast, Romer (1985 and 1990) posited that knowledge spills over from the firm or university where it was created for third-party use.

The second key insight came from another seminal scholar, Maryann P. Feldman (1994), who in her pathbreaking, *The Geography of Innovation*, added an important caveat to Romer’s knowledge spillovers. Feldman confirmed that, just as Romer had suggested, knowledge spills over. However, in her theory of localization, Feldman (1994) explained how and why knowledge would stop spilling over as it traversed geographic space, rendering the spillover of ideas to be spatially localized within close geographic proximity to the source of that knowledge.

Zoltan joined forces with Maryann to confirm not just the spatial localization of knowledge spillovers, but also the greater propensity of small firms to absorb external knowledge than their larger counterparts (Acs et al., 1992 and 1994). The reconciliation of the Schumpeterian Paradox lay in the propensity for small firms to access knowledge inputs and resources that they themselves did not generate, but rather were able to access and absorb through their strategic location within close geographic proximity to the knowledge source.

However, the question still remained as to why small firms would exist in the first place. The Nobel Prize winner, Ronald Coase (1937), had grappled with the theory of why a firm would exist. The most prevalent theories in management and economics assumed that the firm existed exogenously and then devised and implemented strategies to innovate and generate a competitive advantage (Griliches, 1979; and Barney, 1991). But why would a firm exist at a small scale, where it was seemingly encumbered by a paucity of resources and capabilities deemed to be essential for competitiveness and sustainability?

This is where the incipient literature in entrepreneurship proved crucial, with its emphasis on opportunity creation, discovery, and exploitation or commercialization. The entrepreneurship literature focused on entrepreneurship as responding to opportunities. But what is the source of entrepreneurial opportunity? Zoltan provided a unique and compelling answer. Opportunities are created through investments in new knowledge in incumbent firms and other organizations, such as universities and research institutions, that remains uncommercialized and underutilized due to the knowledge filter (Acs et al., 2013, 2009, 2012; Braunerhjelm et al., 2010; and Carlsson et al., 2009). This un- or underutilized knowledge provides the source for entrepreneurs to launch a new venture to commercialize knowledge that otherwise would have been ignored or not valued. The knowledge spillover theory of entrepreneurship posits that people become entrepreneurs to seize opportunities accruing from knowledge created but not commercialized in one organizational context through innovative activity in the context of a new firm or organization (Acs et al., 2013, 2009, 2012; Braunerhjelm et al., 2010; and Carlsson et al., 2009).

Thus, in contrast to the view in the extant literature of economics and management of the firm being

exogenous and engaging in strategic investments to endogenously create new knowledge (Griliches, 1979; and Barney, 1991), the knowledge spillover theory of entrepreneurship inverts the relationship by viewing the knowledge as exogenous. The firm is then endogenously created in an effort by the entrepreneur to appropriate the value of that knowledge or to exploit the opportunity created by that dormant knowledge.

The knowledge spillover theory of entrepreneurship does not mirror other theories of entrepreneurship prevalent in the literature. While the extant theories of entrepreneurship are generally introspective, in that they analyze attributes, characteristics, proclivities, and propensities within the person, the knowledge spillover theory of entrepreneurship follows Welter (Welter et al., 2017 and Welter et al., 2018) by shifting the lens of analysis to the context. Compelling empirical evidence confirmed the theory (Acs et al., 2013, 2009, 2012; Anselin et al., 1997; Braunerhjelm et al., 2010; and Carlsson et al., 2009). Those contexts, such as organizational, industry, spatial, or national, with a greater investment in new knowledge exhibit a greater propensity for individuals to become an entrepreneur. By contrast, those contexts with a dearth of knowledge exhibit a lower propensity for individuals to choose entrepreneurship.

The famous field of dreams theory posits if you build it, they will come. Zoltan knew better. Without his energy, dedication, and blood, sweat, and tears expended to recruit authors and build a community of entrepreneurship scholars, *Small Business Economics* would surely not be the journal it is today. In particular, young scholars and doctoral students found his enthusiasm and total dedication to the pursuit of new ideas to be irresistible. When we started the Entrepreneurship, Growth and Public Policy Group at the Max Planck Institute of Economics in Jena, the importance of harnessing Zoltan's energy, ideas, and enthusiasm was obvious. Zoltan became a fixture in Jena, attracting a small army of aspiring young scholars, spanning a broad spectrum of academic disciplines and fields, with the common goal of making their mark in the growing field of entrepreneurship research. Just as for the Journal, the Max Planck Institute of Economics experience would have been considerably diminished without the intellectual boldness but also personal vitality of Zoltan.

The knowledge spillover theory of entrepreneurship may have provided a new vision and perspective of what must be the most central issue and question in the field—why some people choose to engage in entrepreneurship, while others abstain—but that does not necessarily make it important. Just because a phenomenon can be explained and understood is not a *prima facie* reason as to why (other) scholars and thought leaders in policy and business should care.

Zoltan gave them a compelling reason to care. Systematic and robust empirical evidence identified entrepreneurship as the missing link to economic performance in general, and economic growth in particular (Acs et al., 2013, 2009, 2012; Braunerhjelm et al., 2010; Acs & Armington, 2006; and Carlsson et al., 2009). Those cities, regions, states, and entire countries with more entrepreneurship also exhibited a stronger economic performance, such as higher rates of economic growth, employment creation, and productivity. Thus, entrepreneurship matters because it provides a conduit for the spillover of knowledge, from the organization in which it is created to the startup of a new firm or organization, which in turn provides a catalyst for innovation, growth, employment, and global competitiveness.

What always struck colleagues about Zoltan was his relentless passion for new ideas and to go where no one had previously been. His unique intellect led him to research and insights on topics and themes that, viewed from today's perspective, might seem obvious, but at the time struck many as odd, strange, and obscure. Some of his more prominent and striking intellectual forays resulted in his 2007 book (with Allan Lyles), *Obesity, Business and Public Policy*, and his 2012 pioneering work linking philanthropy to entrepreneurship and national prosperity, *Why Philanthropy Matters: Why the Wealthy Give and What it Means for Our Well Being*. With the virtue of hindsight, it is clear that Zoltan was on to big ideas and crucial social issues, long before they became fashionable and trendy. He was at his very best as a pioneer, boldly venturing out in new but unexplored fertile intellectual terrain.

One new idea that clearly resonated in the entrepreneurship literature was Zoltan's application of the concept of a National System of Innovation to entrepreneurship, resulting in his paper (Acs and Szerb, 2009) "National Systems of Entrepreneurship". This led him to create novel and tractable

tools for analyzing entrepreneurial ecosystems, the Global Entrepreneurship and Development Index and the Regional Entrepreneurship and Development Index (Acs and Szerb, 2009). The GEDI and REDI have been used around the globe to inform and guide thought leaders in policy and business (Acs et al., 2017).

Zoltan has been a visionary in the field of entrepreneurship and beyond. His tenacity, originality, unique views, and motivations, along with his relentless passion for new and fresh ideas, have made him like no other. His expansive influence has left its imprint on an entire generation of scholars following in his intellectual wake. To me, Zoltan has been an inspirational partner, collaborator, and muse, but always first and foremost a friend.

It does not seem that long ago when we hiked past Robert Frost's log cabin on Bread Loaf Mountain in Vermont. It's as if the great poet had Zoltan in mind when he reflected,¹

Two roads diverged in a wood, and I—
I took the one less traveled by,
And that has made all the difference.

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Declarations

Disclaimer All errors, inaccuracies, omissions, and oversights remain solely my responsibility.

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