

Josh Lerner

Editor's Note: *This is an abbreviated version of EF's conversation with Josh Lerner. For additional content, go to our website: www.richmondfed.org/publications*

Joseph Schumpeter, best known for his observation that “Creative Destruction is the essential fact about capitalism,” viewed the entrepreneur as a critical figure of economics; he argued that entrepreneurs and entrepreneurship merited close empirical study by economists. Such research, he suggested in the mid-1940s, “may result in a new wing being added to the economist’s house.”

The profession was slow to take Schumpeter’s advice. Since the surge in high-tech entrepreneurship in the 1990s, however, a growing number of economists have been drawn to the project of building that wing. One of the leading researchers on entrepreneurship and entrepreneurial finance during this time has been Harvard Business School economist Josh Lerner. Along with bringing empirical economic research to bear on entrepreneurship, venture capital, and angel investment, he has pursued research interests in private equity organizations and innovation. In 1993, he introduced the school’s first course on venture capital and private equity, which he still teaches.

In addition to his appointment at Harvard, he is co-director of the Productivity, Innovation, and Entrepreneurship Program at the National Bureau of Economic Research and is editor of its journal, *Innovation Policy and the Economy*. He is also the founder and director of the Private Capital Research Institute, a nonprofit devoted to increasing access to private data on venture capital and private equity and encouraging economic research on those sources of capital. He is the author or co-author of 11 books on venture capital, private equity, and innovation, most recently *The Architecture of Innovation: The Economics of Creative Organizations*.

David A. Price interviewed Lerner at Harvard Business School in July 2016.



EF: How did you become interested in economics in general and in the study of entrepreneurship and private-firm finance in particular?

Lerner: I have a slightly unusual background in the sense that I didn’t study any economics to speak of in college. I went through a program where you could piece together whatever assorted subjects you wanted to. And in the course of that, which included physics, history of science and technology, and a bunch of other topics, I got interested in the whole area around new firm creation and entrepreneurship.

In my first job out of college in the 1980s, I was a research assistant at the Brookings Institution. There was all the talk then about Japan as number one. It seems like a thousand years ago, doesn’t it? Congress had recently enacted the Bayh-Dole Act, which at least purportedly freed the universities to do more in terms of technology transfer. There was a lot of interest in commercialization of science, spinoffs, and so forth. I got sucked into these issues and have never been able to escape since, showing a distinct lack of imagination!

I came to realize that we were clueless not only about how the policies in this arena ought to be designed, but even on questions of how the basic private sector mechanisms worked. Then I met a fellow named Lewis Branscomb, who led the program at the Kennedy School in science, technology, and public policy. He was interested in promoting more study of questions about innovation and the like. As it turned out, Lew was highly persuasive in convincing me to come up to Harvard. He worked out a very nice arrangement

where I was officially studying in the economics department and largely funded by the dean of the business school. I guess even at that point, the business school was encountering a lot of demand for entrepreneurship and venture capital. I came with a pretty clear sense that I wanted to work in this wacky area of how innovative businesses got funded.

At the time, Zvi Griliches was there, the father of doing measurement with patents. I fell under Zvi's spell, and even though this was a little removed from his own work, I realized that I could apply a lot of his ideas to this setting. This was particularly important given that you're dealing with small privately held companies, where traditional metrics are not necessarily going to be useful. You could understand how intellectual property contributes to firm value and use it as a metric for how firms are evolving and other such questions.

I've been pretty much in this same orbit here 25 years later. My theory is that 20 years from now, entrepreneurship's status at business schools will be like finance's today. Entrepreneurship began as a real academic backwater. We're still seen by many as a slightly obscure area today, but I think that it's likely to have more centrality over time.

EF: Much of your work has been in the area of private finance, especially venture capital and private equity. From an economist's perspective, how do private equity general partners create value?

Lerner: Private equity is different from venture capital in the sense that most of the companies are considerably more mature at the time they're getting financing. There's a middle ground of growth deals that look like half venture capital and half private equity, but the typical kind of company getting funded by a classic buyout group is a real business with real profits, a real management team, and so on.

So you see several differences. One is that, for the young companies, it's almost standard that at a certain point the CEO is going to be replaced. It's a rare CEO who can grow a business from one to 100 employees and then grow it from 100 to 10,000 employees. The skill sets in those realms are quite different. In many cases, you see people who have been happily early-stage CEOs for multiple go-arounds: They know that after the company gets to 100 or 200 employees their time will have come, and they'll move on to another early-stage opportunity. With the buyout or private equity-backed companies, replacing management does happen, but it's a much more unpleasant and unexpected kind of event.

Another difference is that so much more of the decision-making and the guidance that the private equity guys are doing relates to financial strategy, as opposed to pure operating strategy. With your typical startup company, there's

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no debt or just a little bank line of credit. The only big financial decision is whether we're going to take the thing public or sell out to some corporate acquirer. With private equity, given the complexity of the balance sheets of these companies — they often have multiple layers of debt, which they juggle over time —

there's so much more of the financial engineering taking place. The role of the private equity guys is in many cases much more that of a financial counselor.

That's not to say they don't also positively shape the operations of the companies themselves. I've done some work with Steve Davis, John Haltiwanger, Kyle Handley, Ron Jarmin, and Javier Miranda where we have looked at exactly how private equity groups change the companies in which they invest. We see evidence of a significant boost in terms of productivity for the private equity-backed firms relative to their peers. But it's typically not the venture-type scenario of saying "let's figure out the business model." It's more figuring out ways to run the business more efficiently.

EF: Of the roles that you identify for private equity general partners, which are the ones where they create the most value?

Lerner: There's been more work done on this in the buyout realm. One of the advantages of buyouts is that because you've got such detailed financial information, you can see often the way in which value is created: How much is real operational improvements, how much of it is the market timing, and how much of it is the financial engineering or the use of debt? A number of papers have done this to try to divide the share of value being created into these three broad buckets. If you asked the private equity guys, many would say, "Oh, 90 percent of it is us going in and adding value to the operations of companies." If you look at the academic evidence, you'd probably say the operational improvements are a lot closer to 30 percent than 90 percent. Not to say that it doesn't happen, but it's only one of a number of levers that the private equity groups are pulling to create value.

EF: Turning to venture capital — is geography becoming less important in the venture capital industry? The conventional wisdom, at least, is that technology is making remote work and long-distance interaction easier in general. Has that been true here?

Lerner: If you looked before the dot-com bust in 2000, you saw a lot of venture capitalists who were of the mentality that "if it's not within a 60-minute drive of my office, it's not worth funding." There was heavy localization within Silicon Valley: Most of the large U.S. groups really focused on the companies there.

But if you look today, you see the large groups have offices in India and China and, in many cases, some footprint in Europe as well. So it's become much more of a global market. Not only have the destinations of the investments changed, but the share of venture capital financing that's coming from the United States has shrunk relative to where it was in 2000. So that would be consistent with the "death-of-distance" kind of argument.

On the other hand, it seems that the power of focal points is still quite strong. I had a Chinese venture capitalist here today; his fund is a relatively young fund, but they've nonetheless already set up an office in Silicon Valley (as well as their home base in China). For many of the companies that they're funding, even if it's Chinese entrepreneurs founding the companies, they want to be in Silicon Valley from day one.

Even looking at the newer markets, the locations of venture activities tend to be lumpy, with a large role for a few places like Tel Aviv, Cambridge in England, and more recently Singapore, Shanghai, and Bangalore. A relatively small handful of markets are hubs of venture activity. For all the globalization that's taking place, it still seems to be very much a geographically lumpy kind of business.

EF: What can economics tell us about the future of the venture capital and private equity industries?

Lerner: One area where I think economics can add some insight, one that's particularly controversial today, is the questions around fees. For instance, fees for private equity funds have been intensely controversial for many of the state pension funds.

One argument would be to say it doesn't really matter how much you pay if you're getting returns that are in excess of risk-adjusted market returns. (It should be noted that many pensions do not get these excess returns!) But even so, if you're a trustee of a public pension, you have a role of being a custodian of employees' money. And if fees are excessive, however you define this, that may be a problem even if you're getting attractive returns.

An interesting thing is that fees in private equity and venture capital are remarkably sticky. The compensation structures don't look that different in today's era of \$10 billion-plus funds than they did back in an era of \$10 million funds. They've come down somewhat, so instead of 2 percent committed capital, it's more likely to be 1.5

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► Present Positions

Chair, Entrepreneurial Management Unit and Jacob H. Schiff Professor of Investment Banking, Harvard Business School
Co-Director, Productivity, Innovation, and Entrepreneurship Program, National Bureau of Economic Research

► Education

Ph.D. (1992), Harvard University
B.A. (1982), Yale University

► Selected Publications

"The Globalization of Angel Investments: Evidence across Countries," *Journal of Financial Economics*, forthcoming (with co-authors); "Private Equity, Jobs, and Productivity," *American Economic Review*, 2014 (with co-authors); "Assessing the Contribution of Venture Capital to Innovation," *RAND Journal of Economics*, 2000 (with Samuel Kortum); numerous other articles in such journals as the *Journal of Finance*, *Quarterly Journal of Economics*, and *Journal of Political Economy*; and numerous books

percent. But given the economies of scale of running a larger fund, it means the profits per partner can be staggering. If you look at the history of financial intermediation, you see in general that as more competition has arrived, prices have come down. I anticipate venture capital and private equity will follow that pattern, but it's been surprising how leisurely the adjustment process has been.

Another area that has gotten a lot of interest is the questions around persistence. There's a fair amount of evidence historically that both private equity and venture capital have been characterized by a lot of persistence: If you're in the top quartile of funds for one fund, your next fund is disproportionately likely to be in the top quartile as well. Similarly at the low end. But there seems to be a variety of evidence that the industry has become less persistent. Persistence seems to be disappearing.

EF: Do you have a view yet of whether the equity crowdfunding arrangements legalized by the JOBS Act will have a major effect on startup finance?

Lerner: When we look over the last 10 years or so, one of the really interesting phenomena has been the growth of what I call "personalized" entrepreneurial finance. By that, I mean we're seeing a whole set of models where, instead of having an institution act as the gatekeeper, you see individuals funding young companies directly. Crowdfunding is one example. We've also seen the rise of individual angels and angel groups. So there's a whole range of things going on, much of which is enabled by the Internet.

I myself am a little bit in the skeptical camp on crowdfunding per se. A lot of my doubts have to do with the inherent contradictions between the entrepreneurial process and disclosure requirements. When you think about what have been the guiding principles of securities regulation, a big part has been based on disclosure: "Sunlight is the best disinfectant." But if you think from the perspective of an entrepreneur, it's very important to keep information close to the chest rather than tipping off competitors early as to your business model. When Google filed to go public, people were shocked by how profitable the search business was for them. Yet at that point, they had already established themselves and had an insurmountable lead that Yahoo and the others haven't been able to catch up to. The natural tendency is to say, "Let's just make everyone disclose everything," but the very process

of disclosing things is likely to destroy a lot of the competitive advantage that the entrepreneurs might have. That's a tough conundrum to solve.

Moreover, when you look at attempts to create entrepreneurial finance models with crowdfunding-type flavors to them, the outcomes have not been great. For instance, there was an effort in Europe during the 1990s to create a whole series of small capitalization models where riskier young companies could list and so forth with relatively lax regulations. They ended up with a phenomenon where the bad drove out the good. All it took was a few scammers to come in and undertake "pump and dump" schemes, and the interest in those markets declined precipitously. And I think some of the same danger lurks here.

I'm much more enthusiastic about models like the AngelList syndicates, which is essentially using a model where the people on the platform see information about the companies and decide whether to fund them or not. But it's restricted to sophisticated investors. You're aware of which of the other sophisticated investors are investing in which companies, which can help shape decisions. So you're using the crowd, but there's also a minimum level of skill and knowledge required to play.

EF: You've written that attitudes toward entrepreneurship are shaped by culture and religion. Research doesn't seem to tell us much about the roles of social forces like these in entrepreneurship. Is that because researchers don't see them as policy relevant or are they simply too difficult to measure?

Lerner: I think a lot of it comes down to the difficulty of measurement. Peers influence what we think about and what our priorities are. But it's hard to show, partly because, by and large, we can't randomly assign people to be in particular places. It tends to be that we choose places to work where we get exposed to certain kind of peers, but that may tell us a lot more about ourselves rather than about the effects of our peers.

Ulrike Malmendier and I tried to find a setting where one could look at this question where there was an element of randomization. We ended up looking at the impact of how students spent their first year at Harvard Business School. In particular, what we have here is a system where people spend the first year with a section of 90 people and they take all of their classes together. These sections tend to be powerful connecting devices for people, still binding them together when they come back for their 25th reunion. So we can ask, does having in one's section fewer or more entrepreneurial peers — people who were entrepreneurs prior to business school — end up affecting the willingness of people who didn't have an entrepreneurial background to start a new venture themselves after school?

When we ran the analysis, we were shocked because we got exactly what we thought was the wrong answer: Having more entrepreneurial peers makes people *less* likely to start

businesses. When we broke it down, however, we discovered that the individuals who had lots of entrepreneurial peers were less likely to start unsuccessful businesses but were as likely or lightly more likely to start successful businesses. So it seemed that having the entrepreneurial peers was scaring people away from doing ideas that subsequently turned out to be unsuccessful, but if anything, encouraging people to go out and start businesses that proved to be successful. That suggested that peers really do matter, but in perhaps a more complicated way than we would initially anticipate.

EF: What do you think are the most important open questions in the study of entrepreneurship?

Lerner: The list of really interesting open questions is a long one, but for me, three areas stand out. One would be understanding the nature of the teams during the entrepreneurial process. I think a lot of the initial work focused on the founder: What was his or her impact in terms of motivation, prior jobs and schooling, and so forth? But when we look at the evidence, we know that ultimately the founders are often a group and there is what economists call a "joint production function."

Venture capitalists often say that they'd rather hire three entrepreneurs from separate companies than three entrepreneurs from the same company, because of their diversity of views. But no one's ever really proved that, to my knowledge, or answered many other questions about how teams work together in startups.

The second one would be related to innovation. A lot of the debate has been focused on firm size and innovation: Do smaller firms innovate more? Probably, but the more one looks at this, the more inconclusive the results are. To me, it's more interesting to ask the question of what kind of innovation is being done: What is the nature of innovation by entrepreneurial companies as opposed to more established firms? And how does that end up affecting the overall evolution of firms and industries?

A third question I would highlight, which we've already hinted at a bit, is about the changing sources of funding available. For instance, among venture-backed firms today, the average company going public was 12 years old at the time of IPO last year. Historically, it was around four or five years old. And so you've got all these companies that are privately held sitting there raising money but staying private. They're getting funded not just by venture capitalists, but also by sovereign wealth funds and family offices and even mutual funds. What's the ultimate implication of this trend? Is being private, sheltered from financial markets, actually good because a lot of people do more long-run things? Or do these arrangements simply allow management to perpetuate poor decisions?

EF: You've done a lot of work with Jean Tirole looking at the incentives behind the creation of open-source

software. What are the main reasons why developers and companies participate in open-source projects? Is it altruism?

Lerner: We've argued that open source — like the Linux or Android operating systems — poses a puzzle. Why would a group of people organize themselves into a project and basically volunteer to develop code that is ultimately going to make a lot of money for Google, Red Hat, and IBM? We argue that there's a combination of short-term and long-term incentives at work.

Short term, often programmers just want to fix a bug or want to use the program to do something that it can't quite do. So one motivation is simply problem solving.

On the other hand, there can also be some tangible longer-term benefits to individuals from participating in these projects. Part of the benefits stem from the fact that taking part in these projects can be fun; there's a lot of ego gratification associated with becoming a project leader. In addition, we suggest that career concerns can play a role. If you're a programmer at a small university in Iowa, even if you're a great one, it's hard for you to "show off your chops" as to how good you are. One of the attractions of open source is you choose a project that fits with your own skills, go out, and work on it. If you are a useful contributor, often you'll be invited to take on more leadership in the endeavor. Many of the most successful open-source projects have people who are participating partially for the ego gratification but also for the career benefits of being seen as a good programmer; this may impress employers and may lead to offers from venture capitalists and the like.

EF: What are you working on now?

Lerner: One of my projects is trying to extend our work on the impact of private equity investment. As I mentioned, my co-authors and I looked at the years up to 2005 and showed that in general there was a positive impact of private equity investment in terms of productivity. The firms backed by private equity seemed to lose jobs at the factories that were open at the time the private equity group came on board, but they also were more likely to open up new facilities that netted out much of the negative effect associated with the job losses.

The question we're asking now is, "what happened after 2005?" The industry had a fantastic boom in 2006 and 2007, there was the crash in 2008 and 2009, followed by long drought, and now there is a strong recovery. Can we

say something about how the effect of private equity has changed? For instance, was the deleterious effect of the leverage in buyouts greater during the crisis period, or were the firms actually able to weather the crisis better because the private equity investors had more tools in place? We're also looking at the performance of private equity groups of different experience, sizes, and past success, in terms of the social consequences of the investments.

Another project that my colleague Victoria Ivashina and I are working on relates to the division of fees and profits within investment partnerships. As I mentioned before, the overall level of rewards that these groups get have been controversial, but no one has previously looked at how the partners divide these among themselves, and what the consequences of these decisions for the partnerships and their investors are.

EF: What do you think are the biggest pluses and minuses of doing economic research in the setting of a business school?

Lerner: There's no one right answer here. If you're doing highly theoretical work or esoteric advanced empirical work, you might argue there's less of a return to being at a business school. For those researchers, the "tax" of needing to put more attention into teaching might be seen as not really worth it.

But for people who are interested in areas where there are a lot of benefits from interacting with practitioners — whether it's access to data or deeply understanding what the phenomena are — there can be substantial benefits from being in a business school setting. In general, the ability to identify and get close to practitioners is easier in a business school setting, where alumni often seek to be actively engaged.

The fact that you're at a business school obviously doesn't mean you'll get any data you want. But it really does help get in the door to be able to tell your story and make a pitch as to why cooperating would be helpful. For instance, for a recent working paper on angel investment groups around the world, we relied a lot on my contacts with Harvard Business School alumni and Antoinette Schoar's network with the MIT Sloan alumni. The alumni were very helpful in both identifying who had the kind of data we were looking for and then advocating within those groups to work with us. So I think there are a lot of pluses in terms of the connectivity. In general, I think the explosion of research using private data — typically from corporations as opposed to governmental sources — may mean business school faculty will be doing a larger share of cutting-edge research in the years to come. **EF**