COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
Subcommittee on Technology and Innovation
U.S. House of Representatives

Creating and Growing New Businesses: Fostering U.S. Innovation

November 2, 2011

Chairman Quayle, Ranking Member Edwards, my name is Ray Rothrock and I am a General Partner of Venrock – one of the oldest venture capital firms in the United States. Venture capitalists are committed to funding America's most innovative entrepreneurs, working closely with them to transform breakthrough ideas into emerging growth companies that drive U.S. job creation, economic growth and general well-being. Venture capital in the United States has been supporting entrepreneurs for over 70 years. Beginning in the 1960s venture capital was professionalized leading to an industry today of 500 firms and $180 billion of invested capital. During this time the industry has mastered, if not perfected, the process of allocating scare capital and human resources towards the most promising new opportunities for companies. Today, the results of the industry reach across the country and the globe, and they touch every aspect of our lives. Venture capital is now a global activity with every developing nation pursuing it at some level. Putting the impact of U.S. venture capital in quantitative terms: Venture-backed companies accounted for 12 million private sector jobs and $3.1 trillion in revenue in the United States in 2010, according to a 2011 study by IHS Global Insight. That equals approximately 22 percent of the nation's GDP. The U.S. venture capital industry has created this level of impact just in the last 50 years alone.

I am also a member of the Board of Directors of the National Venture Capital Association. As the voice of the U.S. venture capital community, NVCA advocates for policies that encourage innovation and reward long-term investment. It shares industry-wide best practices with all its members, and participates

in a number of forums, including testifying before Congress, to keep all beneficiaries of venture capital investment – including the public -- apprised of the U.S. venture community's efforts impact.

I am grateful for the opportunity to be here today and to answer your questions regarding the obstacles that entrepreneurs face in turning innovative ideas into successful companies and what role public policy plays in this process. I will address those issues within the context of the role of basic research and development and technology transfer in fostering and commercializing innovation. I'd like to begin, however, with a broad overview of some factors driving uncertainty for entrepreneurs today.

Overview: Entrepreneurs

Being an entrepreneur and starting a company is very difficult. Within reason, the United States should do everything it can to foster entrepreneurial activity and to reduce the friction to success. Every company ever created began its life as the idea of a single person or a small team of people. This is true of Henry Ford, Thomas Edison, Thomas Watson, Fred Smith, Steve Jobs and Steve Wozniak, and on and on. These innovators were able to grow their ideas into some of America's most successful companies over time. Following these models, entrepreneurs have created entire new industries, including computers, electronics, pharmaceuticals and telecommunications. These industries advanced the United States in every way.

Building a business around an innovative product spurred by a novel scientific discovery involves an enormous amount of risk – for the entrepreneur and for investors. This risk persists through every stage of the company's development, but is particularly acute at the earliest stages. Failure is more common than success. For this reason, innovators crave any certainty and stability they can find when deciding if, when and how to build a company out of a scientific breakthrough. In colloquial terms, the fewer number of moving parts, the better chance of success. Presently, a number of factors are working against entrepreneurs in this regard.

One of the most significant sources of uncertainty for entrepreneurs and investors remains the current volatility in the U.S. economy and capital markets, and the sluggishness of their recovery in the wake of the Great Recession. As someone who speaks with entrepreneurs on a daily basis, I can tell you that the prospect of building a business from scratch – especially one based on a novel and unproven innovation – seems especially daunting under current conditions. I recognize that opinions may differ among the Committee members regarding the extent to which public policy can mitigate these conditions, but as long as the adverse conditions persist, or the lack of action to remedy those adverse conditions persists, so too will the level uncertainty facing entrepreneurs. This will result in fewer new companies being started. If such companies are not started, they will never have the chance to be great.

In addition to the challenges created by current economic conditions, a number of policy issues are also generating obstacles for entrepreneurs looking to build innovative, emerging growth companies. In these cases, we have the opportunity to help reduce uncertainty for entrepreneurs and encourage the innovation they generate. Fortunately, none of them require increased government spending, but they do involve a closer look by government and more understanding on the part of those people making the laws and enforcing them.

Capital Markets

We have an opportunity to reconnect privately held emerging growth companies with capital from the public markets, which they need in order to continue to grow to be great. In the early 2000s and even recently, well-intended and appropriate regulations have been enacted with the goal of policing large public companies and protecting investors. In the wake of Enron and WorldCom, these were important acts that have benefited many. Unfortunately, these regulations have had an unintended negative impact by increasing the friction for small emerging growth private companies seeking access to public capital. In short, it now costs more and takes twice as long for young companies to go public. This has produced

negative impacts on U.S. job creation – given that 92 percent of a company's job growth occurs after its initial public offering – and on the health of our entire capital markets system. Rather than explore this issue in-depth with the committee today, I'll recommend to you a recently released report entitled *Rebuilding the IPO On-Ramp,* which was produced by my colleagues across the emerging growth company ecosystem at the request of Secretary Geithner and others. The report provides a comprehensive analysis of the U.S. IPO crisis and provides policymakers with a clear roadmap for reconnecting emerging growth companies with the public capital they need to create jobs and grow their businesses. The report is included with my submitted written testimony.

Regulatory Review

We have opportunities to reduce uncertainty for entrepreneurs who must seek regulatory approval for their innovative new products. Here, the specific situation at the U.S. Food and Drug Administration provides an illustrative example. For decades, the FDA provided a well-organized method for evaluating new drugs and devices intended for the American market. During this time, entrepreneurs and venture capitalists worked with FDA to bring amazing healthcare benefits to our citizens and ultimately the world. The FDA function was understandable, predictable and allowed for the proper vetting of risk by the entrepreneur and investors going forward. This is a critical point, because it enabled entrepreneurs to judge – in a timely fashion – whether to continue to raise private capital for more development in the event that the proposed drug or device had merit, or avoid wasting further time and money if the product idea was not suitable. Today, for most entrepreneurs and investors, the FDA review process has grown too cumbersome and unpredictable – with the later being the most critical concern. The result has been fewer groundbreaking treatments and technologies available to patients, and an exodus of innovators and investment to foreign shores, where the regulatory path to market is more predictable. That's why my colleagues at the NVCA and I support reforms to the FDA review and approval process that clarify the path to market, increase transparency at every stage, and restore the balance between the benefits and the risks of new therapies and technologies for seriously ill patients. If the situation is left unaddressed,

critical therapies and technologies will not be funded and therefore will not reach the patients that need them; those that are funded may not be brought to market in the United States, which will cost American jobs and our global competitiveness in an industry we have led for more than 40 years. It would be a tragedy not to address this problem quickly and effectively. We must restore an otherwise well-established and effective FDA for the benefit of entrepreneurs and patients alike.

Immigration

We have an opportunity to reduce uncertainty for entrepreneurs through legal immigration reform. Over the last decade, it has become increasingly difficult for foreign-born entrepreneurs and highly skilled workers to enter the United States and remain here, despite their enormous contributions to American innovation and economic growth throughout our history. This uncertainty with regard to their immigration status is compelling many of the foreign-born students who earn their degrees and who have conducted their breakthrough research at U.S. institutions, often with U.S. research dollars, to return to their native countries to work and found new companies, as opposed to doing so here. We can reverse this trend by streamlining the pathway to Green Cards for foreign born graduate students who wish to remain in the United States upon completion of their studies. The proposed Start-Up Visa Act would also help support foreign-born entrepreneurs who wish to innovate and build their companies here in the U.S. It would provide a temporary Green Card to entrepreneurs who raise venture capital investment to start a business. After a period of time, the Green Card will become permanent if they can show that they have created jobs in the U.S. or that they are continuing to grow their company by raising additional capital. This small program would be a breath of fresh air to budding foreign-born entrepreneurs and a great first step in keeping these innovations and the talent which created them in the U. S.

Basic Research

Finally, we have an opportunity to encourage entrepreneurs and foster innovation by maintaining our national commitment to funding basic research and development activities at government-funded labs and

universities. These institutions remain the germination points for the breakthrough ideas that can be commercialized by entrepreneurs and venture investors. I believe that how we get from point to point – from research to breakthrough to the transfer of that breakthrough from the lab to the entrepreneur – merits closer examination today. That's where I will now focus my remarks.

Fostering Innovation through Basic Research and Development

Maintaining America's global innovation advantage requires continued federal funding for basic research and development. Basic R&D is the lifeblood of innovation because it produces the scientific breakthroughs from which innovative new products can be developed and around which new companies can be built. Without basic R&D, America's innovation pipeline would dry up.

For decades, the public sector of the U.S. has conducted such R&D through federal institutions and agencies such as the National Institutes of Health, the National Academies of Sciences and the Defense Advanced Research Projects Agency, or DARPA. The federal government has also funded research at universities across the U.S. through grants, scholarships and the like. This unique public-private partnership has delivered countless innovations to the American public. For example, the Internet grew from DAPRA research on a "best-efforts" communication infrastructure. Google was the result of government funded PhD research on search and taxonomy of language at Stanford. Sun Microsystems was government funded PhD research on computer architectures at Stanford and computer operating systems at U.C. Berkley. Genetech was formed from the invention and understanding of recombinant DNA, which was originally developed at U.C. San Francisco. These and many many more are just a few of the examples of successes have generated a decisive competitive advantage to the U.S. economy.

To preserve this advantage, the U.S. must maintain its commitment to funding basic research at its labs and universities. That means keeping current funding levels where they are – even in the face of deficit reduction. In difficult economic times, budgets for basic R&D may look like easy targets, but future costs

in lost innovation and economic growth are nearly impossible to estimate. But the costs in jobs, economic benefits, and societal well-being are easily imagined when you consider if Sun, Google, and Genetech were never created. R&D dollars are the highest multiplier dollars in terms of their ability to attract additional financing over the long term, once inventions are proven out.

In addition to maintaining current general funding levels, we have the opportunity to provide certainty for entrepreneurs and foster innovation through three specific initiatives:

First, thanks to the good work of this Committee, the Advanced Research Projects Agency - Energy, (ARPA-E) program is finally enacted. Congress established ARPA-E in 2007 under two broad rubrics. First, America's dependence on foreign fossil fuels cannot continue at its current rate. Second, the nation that grows its economy with clean energy will lead the global economy of the 21st century. Those two constructs remain true today. Presently, our global competitors are putting billions of dollars into basic research to develop innovative clean technologies. Those innovations will generate economic growth. We need that innovation and that growth to occur here in America. If Congress fails to commit to fully funding ARPA-E over the long term, the United States risks ceding its technology leadership position to foreign countries and potentially operating at a competitive disadvantage for decades. I want to thank this Committee for its leadership and commitment to supporting ARPA-E. At a time when every program is at risk for reduction or elimination, ARPA-E survived floor votes to cut funding and was able to increase its appropriation. I am very familiar with the work that ARPA-E does under the leadership of Director Majumdar and I can tell you with certainty that this investment will yield tremendous results in the coming years and help to keep America competitive.

Second, Congress should restore eligibility for Small Business Innovative Research, or SBIR, grants to venture-backed companies. Congress created the Small Business Innovation Research (SBIR) program in 1982 to stimulate technological innovation and to encourage small businesses to meet federal research

and development needs. Today, however, the Small Business Administration's interpretation of the SBIR eligibility requirements excludes companies with majority venture funding – a complete reversal from the program's original intention and practice, which had worked well for decades. This exclusion works against the program's objectives, as it has prompted many such companies to discontinue promising basic research projects – jeopardizing future scientific advances and job growth. By explicitly restoring eligibility for venture-backed companies, Congress and the SBA can ensure that the pool of SBIR grant seekers comprises the very best U.S. companies, which in turn will maximize the impact of every SBIR dollar.

Third, Congress can encourage the Department of Energy to award more DOE grants to innovators. Venture-backed companies aren't excluded by law from earning DOE grants and loans, but most get passed over in favor of large, multinational energy conglomerates. Rather than reinforcing the status quo, the DOE should redirect existing pools of grants and loans to clean-tech innovators with the potential to create entire new industries here in the U.S. These grants should focus on the future – not the past.

Again, I want to point out that these initiatives do not require additional government spending. Rather, these programs should be reexamined or reprioritized so that they help enhance the innovation pipeline and sources of ideas and companies. This requires careful analysis and rethinking of many government sponsored activities.

Technology Transfer: From Lab to Market

One of the first critical steps on the path from scientific breakthrough to marketplace is the transfer of an innovative technology from the laboratory where it was developed to the entrepreneur who will develop a commercial product from it and build a new company to market it.

Here again, the entrepreneur seeks a clear, transparent and predictable process to help minimize uncertainty and mitigate risk. Most research institutions have a technology transfer apparatus in place and an office dedicated to managing it. Typically, this apparatus comprises three functions: record-keeping and compliance, patenting and licensing, and commercialization support. The first function is fairly self-explanatory. The second, patenting and licensing, involves managing the institution's patent portfolio and prosecuting to completion its patents and license agreements. The third, commercialization support, aims to spin off innovative technologies into startup companies that can apply the technology to develop new commercial products and bring them to the marketplace. My firm has participated in scores of these transfers from universities from all over the United States.

The essence of a successful transfer from lab to market is about the entrepreneur who will commercialize the innovation. Some university transfers involve the graduate student or professor who made the research breakthrough, but this is rare. Much more often, the technology transfers to an entrepreneur with some business experience. This entrepreneur, like all the others described in this testimony, faces all the burdens and risks of starting a company, raising capital, attracting employees, and ultimately finding customers. Every time those entrepreneurs go elsewhere to start their companies, even if the invention was developed within the U.S., then this country loses a very special opportunity.

Growing New Venture Ecosystems

Throughout my testimony, I have described the crucial role that research institutions play in fostering innovation. They are also the key catalysts in building venture capital ecosystems like the ones in Silicon Valley, Boston's Route 128 Corridor, and the Research Triangle in North Carolina. That's because most successful venture capital hubs begin as communities of innovators.

These innovators are usually drawn together by a top-flight research university, government laboratory or academic community. An innovative company with venture-capital roots – like Dell, in Austin, Texas or Medtronic, in Southeastern Minnesota, for example – can often draw talent to the community, too. These companies regularly spin-out new ideas and companies from existing operations. They also provide a pool of management talent.

Often, these communities coalesce around a certain niche – like semiconductors at the birth of the Silicon Valley. Other examples include Tennessee with healthcare services and Orange County, California with ophthalmology, as well as the biotech industry that thrives in the I-270 corridor in Congresswoman Edward's state of Maryland, and the energy and high-tech innovations that are coming from Congresswoman Biggert's home state of Illinois as a result of the partnership between Argonne National Lab, the university and the local business community. Concentrating on these niches creates a virtuous circle that spurs research and innovation, draws more talent to the startup companies and the local universities, and attracts more capital to the area. All of this generates economic growth in the region.

These innovators become entrepreneurs when they try to build their ideas into successful businesses. This can only happen consistently within a region if certain conditions are present. As explained earlier, there must be a sound mechanism for transferring technological innovations from the research institutions to the entrepreneur who will guide them to market. An educated workforce with the skills to fill high-tech jobs is also important, as is a robust network of lawyers, accountants and other business professionals to help with networking, intellectual property protection, securities and IPO registration compliance, and hiring issues. In addition, the region must have an infrastructure that can support growing companies. That means efficient local and regional transportation systems, affordable housing, quality schools and vibrant cultural and social scenes.

Government and civic support is also essential. This starts with favorable tax policies, common-sense regulatory structures and encouragement of basic research. State and local initiatives that reward emerging growth companies through tax incentives also make a significant difference.

These are the ingredients that make for successful venture capital hubs like Silicon Valley. I want to emphasize that venture capital is just one participant in such ecosystems. We do not create them from scratch. States should understand that growing such an environment is a long-term endeavor that requires local leadership. However, I'm sure that those states that have succeeded will tell you that the economic benefits are worth the effort.

Conclusion

Entrepreneurs face many difficult hurdles in starting and building their companies. It is hard enough to identify an invention with product potential, then attract capital from a venture capitalist in order to build the invention into a great product, and then ultimately sell that product to a customer who will actually pay for it. Uncertainty regarding regulatory outcomes or a lack of transparency, along with sweeping financial regulation created from good intentions but adversely effecting the startup company ecosystem, have prevented more than one good company from growing into a large, industry-leading company. The legal obstacles for foreign-born entrepreneurs to remain in America after being educated here have also hindered our economic growth. These are extra - and in some cases, costly – burdens that either reduce the probability of success for well-meaning entrepreneurs or drive them away entirely. While some of these issues fall beyond our control, others present immediate opportunities for action on the part of Congress and local communities. The policy measures outlined above are not extensive. On the contrary, they are inexpensive to implement and would have an enormous multiplier effect on economic activity. Thus, if we seize these opportunities to reduce uncertainty for entrepreneurs, we can ensure that innovation and the economic growth it generates will continue to thrive in the U.S. Working with entrepreneurs, I, as a venture capitalist, have "engineered" more than 50 companies in the last 23 years. There is no shortage of enthusiasm for entrepreneurship or invention in America. As I said, venture

capital was professionalized here 50 years ago; it may ultimately be America's greatest export. Therefore, we must do all we can to foster innovation with R&D support and to the keep barriers to commercializing and investing in that innovation low. Most of all, we must ensure that America continues to be the destination of choice for anyone around the world with a great idea. I am confident that we can do so.

In closing, I want to personally thank you for the opportunity to discuss these important issues with you today. I am happy to answer any questions you may have about venture capital or the business of building companies from scratch. And, I wish to thank you for your service to our country in your capacity as Members of Congress.