



Finance Revenue and Bonding Committee

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Testimony

By

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S.B. 1, An Act Concerning Innovation, Entrepreneurship and Connecticut's Economic Future

Chairman Fonfara, Chairman Berger, Ranking Member Frantz and Ranking Member Davis, Members of the Finance Revenue and Bonding Committee, thank you for the opportunity to offer testimony on Senate Bill 1, *An Act Concerning Innovation, Entrepreneurship and Connecticut's Economic Future*. My name is Dr. Jeff Seemann, and I am the Vice President for Research at the University of Connecticut, including UConn Health. I am accompanied by Rita Zangari, my Director of Innovation Programs and External Relations.

Competitive advantage based on innovation and scientific knowledge has been the key to American economic success since the end of WWII when deliberate sustained federal investment in science and technology was demanded to win the cold war.

Those federal investments paid off in Connecticut and all across the US, but as prosperity has waned for a variety of reasons, the regions that continued to flourish, along with those that were rebuilt and flourish again today, are those where the value of University research was realized and leveraged.

Universities play a key role in economic competitiveness and growth. Senate Bill 1 recognizes this important fact and that the universities that have emerged as economic drivers in highly prosperous regions did so by linking the practical needs of industry to academic research interests. Many did so at the urging and with the support of state government.

North Carolina's research triangle enjoys a booming economy built on the long term success of UNC, NC State and Duke research and the creation of tech companies associated with these institutions.

The Georgia Research Alliance (GRA) invests state dollars in expanding research and commercialization capacity in Georgia's universities to launch new companies and create high-value jobs. The Atlanta

metropolitan area is the No. 10 largest metro economy in the United States and the largest in the South. GRA's recipe for success;

- Recruiting world-class scientists to Georgia universities
- Investing in state-of-the-art research technology for university labs
- Fueling the commercialization of university-based discoveries and inventions
- Forging and strengthening alliances among universities and industry

In Madison, Wisconsin, WARF – the Wisconsin Alumni Research Foundation -- has commercialized technologies from the University of Wisconsin, Madison for decades, generating revenue and jobs in the process. The unemployment rate in Madison, Wisconsin, is 3.70%, with job growth of 1.20%. Future job growth over the next ten years is predicted to be 38.70%

Closer to home -- Boston area institutions are key factors in the state retaining the top spot in the Kaufman New Economy Index for nearly a decade. New York is starting to experiencing an economic renaissance and lowering taxes following years of investment in varied research institutions to promote biotechnology and major investments in SUNY Albany that built alliances with industry around nanotechnology.

I personally witnessed as a PhD student how Stanford faculty, students and innovations produced advances in technology and the formation of companies that have made Silicon Valley one of the most innovative and productive high-tech regions in the world.

In 2013, this Committee was instrumental in the passage of NexGenCT – a ten-year plan to expand science, technology, engineering and math (STEM) capabilities at UConn. Due to this transformative program, UConn's research awards have increased substantially between FY 13 and FY 15, we are increasing Connecticut's STEM-trained workforce, and we are building expertise and new technology resources required by Connecticut's many high technology companies. The investment of BioScienceCT in UConn Health is paying similar dividends. These investments are an important step, but they cannot stand alone to create the kind of prosperity Connecticut deserves.

Senate Bill 1 compliments NexGenCT and BioScienceCT as we continue to grow the research pipeline to feed both UConn's technology commercialization potential and Connecticut's economic development needs. We are pleased to see a bill aimed at strengthening innovation and offering the increased potential to utilize new discoveries and technology as the basis of a strong sustainable Connecticut economy. As Connecticut's only public research university, UConn takes seriously its role as a catalyst for innovation and technology commercialization. Even though we are experiencing funding reductions like every other state agency, we are committed to attracting and retaining expert faculty skilled at research and commercialization because we know that research and discovery are key to Connecticut's long-term economic growth. We are proud of our strong track record operating technology business incubators located in Storrs, Avery Point and UConn Health – and I note that we just opened a new incubator facility at UConn Health made possible by BioscienceCT. UConn's Technology Incubator Program

(TIP) has helped over 60 technology-based companies since its start in 2003, with approximately 60% of all of these companies successfully graduating the program. This compares favorably to the nationwide success rate of 25%. TIP companies have had an impact on the Connecticut economy, raising \$38 million in grants and another \$39 million in debt and equity while generating over \$41 million in revenues since 2004. In FY 2015 alone our incubator firms filed 62 patents.

While this is all a great start, we know much more is needed to enhance UConn's technology commercialization capabilities and we are grateful that S.B. 1 may allow us to expand our efforts in this critical area. UConn faculty disclose 70 to 100 new inventions annually and between 20 and 30 patents are issued to UConn each year. We have had nearly 500 patents issued in all. Yet none of this will have value if UConn does not have sufficient personnel and financial capacity to make this intellectual property attractive to industry, investors, and other partners. Senate Bill. 1 strives to replicate what has occurred in other states where leading research institutions not only educate students and pursue scientific inquiry, they apply their discoveries and knowledge to technology commercialization and company creation, ultimately becoming the centerpiece of economic advancement within their region. This occurs successfully when universities provide the technology pipeline for new and existing industry, enabling development and deployment of innovative products and solutions. UConn, due to NextGenCT and BioScienceCT, is well positioned to expand that pipeline.

It is important to note that commercialization and innovation are not simply about startup companies. At UConn our research can attract out-of-state companies and impact emerging needs of existing firms as well. We thus seek to support the creation of new companies, the attraction of new companies to Connecticut, and the ability of existing firms to prosper in the innovation ecosystem as a vibrant part of Connecticut's economy.

Angel investors, venture capitalists and strategic industry partners continue to push back the stage at which they are willing to invest in emerging technologies. Researchers face great difficulty finding funds to develop and test prototypes, or conduct translational studies. Today UConn invests \$400K annually in such endeavors, but much more is needed to harvest the new discoveries anticipated by NextGenCT and BioScienceCT.

Public research institutions like MIT, Georgia Tech, Wisconsin, Penn State and many others have highly effective tools to close systematic gaps between basic research and company formation that impede new market opportunities. These tools support both startups and the evolution of existing industry by linking research and development at the institution with emerging industry needs through "proof of concept" programs. Such programs provide phased-in support that demonstrates the efficacy and value of a technology, and positions them for venture investment.

For example, in developing a new cancer therapy, researchers must not only identify an active compound that attacks cancer cells (funded by NIH, for example), they must collect animal data on multiple topics that demonstrate effectiveness and marketability ("proof of concept" funding). This is necessary to

attract an industry partner or investor able to provide the venture capital for human studies, regulatory approvals and beyond. In engineering disciplines potential partners may require working prototypes and data that demonstrate specific technology readiness levels are achieved. These steps precede formation of a company and are necessary to reduce the risk for partners and investors. Federal programs do not provide this capital and neither do investors or partners. Proof of concept centers provide grants for these projects in order to demonstrate the value of academic R&D and to integrate it with industry requirements.

Therefore, while it is very exciting to see a venture fund directed at UConn faculty and students, it is important to note that a key gap in the innovation pipeline (i.e. proof of concept capacity) precedes the formation of a company and readiness for venture investment.

We are also excited to see that the bill provides bond funding for five years for personnel for entrepreneurship activities. Given the recent budget cuts, this funding is critical to our commercialization capabilities, but we would propose that this activity might be better described as “technology commercialization” to ensure the capability to work with startups and existing industry, and that activities focus on commercializing the NextGenCT and BioScienceCT supported technology pipeline.

What makes a real difference in the technology commercialization arena is identifying the right pathway to market and finding interested partners willing to learn how a new discovery can become a viable product. That involves many, many people – technology scouts, regulatory officials, industry experts, and investors. It requires unique technical skills as well as knowledge of industry. It is a huge and time-consuming endeavor to find the funding and management necessary to convert a new idea into a product. I am pleased to see that S.B. 1 would provide UConn funding for personnel to significantly expand this work so that our technology commercialization capacity can grow to meet the capacity of our R&D pipeline. While UConn has a center for entrepreneurship and innovation, that center is aimed at educational aspects of entrepreneurship and supports startup companies – it is not specifically focused on tech commercialization. Senate Bill 1 offers an opportunity to build on our current capacity to deploy UConn-developed technology emerging from UConn’s NextGenCT- and BioScienceCT-enhanced research and development pipeline.

With the minor suggestions we have outlined – support for additional technology commercialization personnel and funds for proof of concept projects – S.B. 1 will give UConn the tools it needs to build upon the growing research successes made possible by NextGenCT and BioScienceCT to help our faculty and students start new businesses, create jobs and keep Connecticut companies competitive. With these new resources we can aggressively move forward to help make our state’s future brighter. We look forward to the opportunities this legislation affords.

Again, I would like to thank the Committee for its leadership in raising S.B. 1 and for your continued support of the University of Connecticut.