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Fueling Local Economies:
Research, Innovation, and Jobs

Thank you for asking me to discuss with you today the ways in which federally funded innovation benefits national and local economies and ways in which federal research dollars can be better leveraged to generate even greater economic and social benefits.

Your attention to these topics could not be better timed. The U.S. economy is struggling to recover from one of the deepest downturns since the Depression, even with the extraordinary fiscal and monetary stimulus measures of the last two years.

Economic research has established two keys to sustained growth over the long run. First, continued innovation will play a central role in the future, as it has in the past, in driving long-run growth and thus continued improvement in living standards. Second, as I will discuss shortly in more detail, entrepreneurs are critical to disseminating innovations into the marketplace and throughout society.

Furthermore, Kauffman Foundation-supported research has established that *new* firms—those no more than five years old—over the past three decades have been

responsible for virtually all of the net new jobs created in our economy.[1] If the economy is all about "jobs, jobs, jobs" then we must rely on a new generation of entrepreneurs to commercialize the innovations of the future and in the process bring back the roughly 8 million jobs that have been lost in this recession.

I want to address, therefore, today four topics that should be of interest to this Committee:

(1) the importance of federally funded research in spawning innovation, both for the national economy and local economies;

(2) the limitations in the current university/lab eco-system that slow the commercialization of innovations spawned by federal funding;

(3) measures that would overcome these limitations; and

(4) how the reform of immigration policies could significantly raise the rate at which new "scale" businesses, often commercializing innovations, form and grow.

I want to emphasize that none of the reforms I advance under topics (3) and (4) today would require any more than a de minimis amount of additional federal spending, a feature that should be of special interest to the Congress and the American people given the importance of reducing federal deficits over the longer run.

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[1] See John Haltiwanger, Ron Jarmin, and Javier Miranda, "Jobs Created from Business Startups in the United States," Kauffman Foundation, January 2009, available at www.kauffman.org; and Dane Stangler and Robert E. Litan, "Where Will The Jobs Come From?" Kauffman, Foundation, November 2009, available at www.kauffman.org.

The Importance of Federally Funded Research

In 2009, the various federal agencies spent $147 billion on research and development. Roughly 60 percent of this amount, or about $90 billion, was channeled through U.S. universities.[2]

U.S.-funded research benefits not only Americans but ultimately citizens throughout the world when it leads to new knowledge and innovation—new products, services and methods of production. Innovations cannot generate these benefits, however, unless they are disseminated. Universities are central to this process through their teaching of students and publications of their faculty in academic publications and increasingly via the Internet.

Increasingly, universities and our federal labs also disseminate innovation through their commercialization activities—specifically the licensing of discoveries by faculty members to companies they form or to existing firms. Some contest whether commercialization should be a university function at all, however, arguing that universities exist to further the creation of new *basic* knowledge and that it is not their role or that of their faculty to engage in commercialization. Based on this view, some worry that commercial activities divert faculty from more fundamental research and their instructional activities. Moreover, it is sometimes claimed that commercialization can distort the values and culture of the university, its faculty and its leaders.

These worries are misplaced. Universities may be Ivory Towers but they are not monasteries. New knowledge for its sake cannot benefit human beings unless it also

[2] National Science Foundation, *Science and Engineering Indicators 2010*, Chapter 4.

is applied to real-world problems and challenges. When this is done, the results must be disseminated throughout society. In market economies, dissemination is often best accomplished when innovations are commercialized, for it is the infusion of human and financial capital that enables innovations to "scale." To take the academic inventors out of this process can significantly reduce the likelihood that discoveries in the lab will be turned quickly to constructive uses by the larger society which exists outside university walls.

Moreover, the notion that there is some bright line between "basic" and "applied" research also is misplaced. It is impossible *ex ante* to predict which research activities, supposedly basic design, will turn out to have commercial potential. Indeed, this fact highlights another key point: invention (the discovery of a new idea or technology) is not the same as *innovation* (which is the *application of the invention* to addressing a real-world problem or need). Generally speaking, universities and federal labs are much better at invention than innovation, with the exception of the rare "inventor/innovators" able both to discover something new and then find ways to introduce it into the marketplace as a true innovation.

In fact, America's academic inventor/innovators have made great contributions to our society and economy, with the aid of federal funding and because the Bayh-Dole Act of 1980 facilitated commercialization by clarifying that universities have rights to the intellectual property developed with federal funds. As evidence, consider the list of the 50 most important innovations and discoveries funded by the National Science Foundation in its first 50 years, according to the NSF itself in 2000. Although this *Nifty Fifty* list includes some huge basic advances—such as the discovery that the universe is expanding at an accelerating rate—most items on the list are innovations that have been commercialized, or that have become platforms for many commercial products and services and are widely in use: barcodes, CAD/CAM software, data

compression technology used in compact discs, and perhaps most significant of all, the Internet (which the NSF funded along with DARPA, a defense research agency).[3] Not all of the *Nifty Fifty* innovations are high-tech, however, but their importance is indisputable. These include yellow barrels used on the sides of highways to slow down out-of-control vehicles before they hit barriers and walls, and the American Sign Language Dictionary, which has changed the lives of the deaf.

Another, more recent accounting of the importance of university-generated innovations is reflected in an analysis of the top 100 "most technologically significant new products" listed each year in *R&D* magazine. Fred Block and Matthew Keller report that universities and federal laboratories have become much more important sources of the top 100 innovations over the last 35 years.[4] In 1975, for example, they note that private firms accounted for over 70 percent of the R&D 100, while the academic institution share was just 15 percent. By 2006, just three decades later, these two shares were reversed: academia contributed over 70 percent of the top 100 innovations, while private firms accounted for about 25 percent. Bayh-Dole almost certainly helped contribute to this turnaround, but so has the huge growth of federal funding for research over the six decades after World War II.

University-generated innovations, if anything, should be even more important to the U.S. economy and society in the years ahead. As Jonathan Cole states in his impressive history of universities in the United States, "*In the future*, *virtually every new industry will depend on research conducted at America's universities* (emphasis

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[3] National Science Foundation, 2000. *Nifty Fifty*, available at www.nsf.gov/od/lpa/nsf50/nsffoutreach/htm/home.htm.

[4] Fred Block and Matthew Keller, 2008, "Where Do Innovations Come From? Transformations in the U.S. National Innovation System, 1970-2006." (Washington, D.C.: The Information Technology and Innovation Foundation).

added)."[5] Federal research monies will continue to be heavily involved in bringing this better future about.

Federal funding of university research is not only important at the national level, but also has significant local or regional benefits or spillovers. One of the important channels through which this occurs is the commercialization activities of so-called "star scientists," those uniquely gifted individuals who are terrific teachers, researchers and entrepreneurs.

In a series of papers, Lynne Zucker and Michael Darby, both professors at UCLA, have investigated the economic effects of star scientists.[6] They find that businesses with higher star scientist involvement go public faster and with higher overall valuations than firms with little or no contact with star scientists. In a survey of pharmaceutical businesses, for example, firms working with star scientists survived at a rate of 80 percent over 9 years, while firms without such star support survived at a rate of only 17.4 percent over the same period.[7] Further, in many high-tech industries, from biotechnology to semiconductors, support of star scientists has been associated with the creation of firms that are leaders of an industry both in terms of increased employment and innovation. For example, biotechnology firms that are highly involved with star scientists employ on average nine times as many people as those without any star involvement (80 employees compared to 734 per firm). Star

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[5] Jonathan Cole, 2009. *The Great American University: Its Rise to Preeminence, Its Indispensable National Role, Why It Must Be Protected* (New York: Public Affairs).

[6] These articles are summarized in Zucker, Lynne and Michael Darby. 2009. "Star Scientists, Innovation and Regional and National Immigration," in David Audretsch, Robert Litan and Robert Strom, eds. *Entrepreneurship and Openness: Theory and Evidence* (Northampton: Edward Elgar), pp. 181-211.

scientists, when serving as the primary resource fueling a startup or when employed by existing firms, drastically improve the chances that a given venture will survive and grow, leading to more jobs and higher output.

Beyond the impact of star scientists on specific firms are many regional benefits. The mere existence of star scientists in a given region tends to increase the number of technologically related startups in the area. In part, this positive impact flows from scientists working directly with businesses. In addition, the “star power” these scientists bring to their ventures encourages the development of an ecosystem—other scientists and professionals, as well as skilled workers—around the firms they help create. This ecosystem makes it easier for other entrepreneurs with their own ideas to launch new ventures, creating a virtuous circle of development. It is in this way that regions can develop into hubs of new technology, ventures and ideas. Examples include: Silicon Valley with Stanford and Berkeley, Austin (University of Texas), Boulder (University of Colorado), San Diego (UC San Diego), Raleigh-Durham-Chapel Hill (Duke, North Carolina, North Carolina State), and Seattle (where the local university, Washington, has been important, but not the critical ingredient to that area’s entrepreneurial success).

I want to stress that national or even local policy (with the possible exception of Research Triangle Park in North Carolina) did not intend to create any of these high-tech hubs or clusters, but that each emerged as the by-product of entrepreneurial success that was fueled by federal research money or contrasts. In other words, federal research funds may increase the chance of launching a new cluster in a given area, but money alone does assure success. Somewhere along the way there must be some entrepreneurial sparks.

A key challenge for the nation at this critical time is for policymaking more generally (beyond federal support of university research) to help encourage many such entrepreneurial sparks. The health and future growth of our economy depends on this.

Translating Research Into Commercially Useful Innovation: We Need To Do Better

Yet as important as federal research support is for innovation, it is not the only ingredient. America's "innovation machine" is actually a complicated mechanism or engine that has many parts: universities, federal labs, entrepreneurs, financiers and even lawyers (to ensure that inventors secure appropriate intellectual property rights in their inventions). Before we pour even more fuel—that is, federal money—into this innovation machine, it is important to make sure that it is firing on all cylinders. Otherwise, the machine is likely to fall victim to diminishing returns, with less and less innovation coming out of the process.

There are several reasons why our current innovation system is not performing as well it could and should. That's the bad news. The good news is that these problems can be fixed.

Issues Related to the Allocation of Federal Research Monies

First, there are problems with the way federal R&D money is distributed to researchers.[8] One well known by-product of the peer review system for awarding research monies is that it too easily tends toward "clubiness," which in turn imparts a

[8] For a general discussion of the problems in the ways federal research monies are handed out, see a recent essay by my colleague and Kauffman President, Carl Schramm, "Made in America", in *The National Interest On-Line*, April 20, 2010.

bias against out-of-the-box thinking and research. Competing scientists have incentives to scratch each other's backs to ensure that each receives grants. In addition, peer reviewers who are at the top of their fields can have an inclination to avoid challenges to the scientific orthodoxies to which they themselves may have contributed. These features of the current peer review system—however well-intentioned and sensible it may appear on the surface—have the effect of awarding federal monies to older researchers who are less likely than younger scholars to explore ideas which could upend the old order and usher in real breakthroughs.

This age bias in peer review awards has been recognized as a problem by some foundations. The Gates Foundation, for example, has launched a special initiative, *Grand Challenges in Global Health*, that is aimed specifically at funding untested ideas with high innovative potential. The Foundation wants to avoid the standard peer review process by reaching out to any researchers, regardless of age, who might have breakthrough ideas to fight global diseases.[9]

The federal government should follow suit in some form. Perhaps some fraction of federal research dollars should be set aside for younger scientists. Or there may be ways of fixing the current peer review system, such as putting younger scholars on the review panels. I don't know which remedy or mix of remedies is ideal, but this issue is important, can be rectified and should be further explored.

Another problem with the current federal research spending effort is that it has some of the characteristics of defense spending—by which I mean that research dollars must be spread around to as many Congressional districts as possible to assure

[9] The President of the Gates Foundation's Global Health Program, Dr. Tadataka Yamada has written that "[p]eer review can kill truly novel ideas because they are, by definition, peerless." See Tadakata Yamada, "In Search of New Ideas for Global Health," *New England Journal of Medicine*, 2008, 358:13, pp. 1324-25.

some degree of political “equity” in the awards. For example, by my count, NIH has grants in 429 Congressional districts. While there are many highly qualified health researchers in America, they are unevenly distributed; the best institutions tend to have the most, it’s a fact of life. When research money is allocated by federal research agencies as much to help sustain political support in Congress as it is to secure the best research outcomes, then the system is generating less innovation than it could be.

This problem is not easily solved. It is understandable why elected officials want the most research money—or any federal money—for their districts or states. One obvious solution is for Congress to avoid earmarking research funds for particular projects or regions. Another approach may be to require the research funding agencies to measure and report on the successful outcomes (new firms started and their revenue and employment growth, and patents filed for or received) per dollar of research money handed out by state or even Congressional district. Sunlight has a way of at least partially restraining the natural impulse to distribute funds for political reasons.

Issues Relating to the Commercialization of Federally Funded Research

Not only are the flaws in the way federal research money is handed out, but perhaps even more important, the system for commercializing the innovations that are generated by the research is not operating at peak performance. Here, I specifically am referring to the process in America’s universities, and I believe in our federal labs, for licensing the intellectual property (IP) rights in innovations financed by federal research funding.

Thirty years ago, in passing the Bayh-Dole Act, Congress recognized the importance of commercializing the results of federally funded research by authorizing universities to hold and license IP in innovations spawned by this funding. This Act was an important development and no doubt has helped contribute to an increase in the share of major breakthroughs that are accounted for by academic researchers.

One of the unintended consequences of the Act, however, is that universities responded by centralizing all of their licensing and commercialization activities in single offices—now known as technology licensing offices (TLOs) or technology transfer offices (TTOs). There were good reasons for this, among them: to realize economies of scale in licensing, to assure that faculty members reported their discoveries to the universities so that universities could thus accurately keep tabs on royalties they were owed under faculty employment agreements, to coordinate patenting decisions when multiple faculty and students were involved, to coordinate licensing arrangements when faculty from other universities were co-inventors, and presumably out of a belief that TLOs would accumulate more knowledge about the most advantageous licensing opportunities than individual faculty members.

But centralization has had a price. It has given the TLO on each campus what amounts to monopoly control over the licensing activities of all university faculty innovators. As my Kauffman colleague Lesa Mitchell and I have recently argued,[10] this subjects faculty inventors to a bureaucracy that may not always have the expertise or resources to quickly and most efficiently commercialize their discoveries. If universities applied the same model to faculty research, it would mean that all faculty members would be required, by contract, to first obtain the approval of a

[10] Robert E. Litan and Lesa Mitchell, "A Faster Path from Lab to Market," *Harvard Business Review*, January, 2010, pp. 52-53.

central “publications office” that would coordinate the submission of articles to journals and books to publishers. It almost goes without saying that faculty would not stand for such an approach to their publications, nor would universities voluntarily adopt it for fear of frustrating the dissemination of research results to the academic community and the wider public. Yet when it comes to commercial activity, universities have taken a very different approach, one which I believe generates less innovation and more slowly than would be the case than if we allowed *the market* rather than bureaucracies to make the key licensing or commercialization decisions.

By market decision-making I mean allowing university faculty members, as well as employees of federal labs, to have decision-making authority over the licensing of their discoveries, while leaving undisturbed their employment contracts that split royalties or other income with their university employers (or the federal government, in the case of federal labs). In essence, faculty or lab innovators should be able to use the licensing agents of their choosing, include their own university’s (or their agencies’) TLO, TLOs at other universities (or agencies) that have expertise in the particular subject matter of the innovator’s discovery and that realize the entrepreneurial potential of competing for this business, or agents not affiliated with universities.

Ideally, universities would realize the advantages of a free market in technology licensing on their own. Such a market would provide much stronger incentives for faculty to commercialize their discoveries more quickly, eliminating the potentially long waits at the TLO to get recognition. This would generate benefits for society, for faculty innovators and the universities who will share in their success. Choice in licensing would also encourage specialization and thus economies of scale among licensing agents, whether or not they are affiliated with universities. Some universities might even decide to drop their TLOs, merge or pool them with other research

institutions, or significantly reduce their staffs as a result and thereby save money and generate better returns. Or universities could decide to keep their TLOs to compete with other licensing agents and/or transform them into technology consulting offices that would give advice to faculty about the commercialization and licensing process.

The federal government can and should facilitate a market in technology licensing—that is, help push universities along to do what is in the broader public interest. Individual funding agencies could require grantee organizations to provide evidence of their commercialization capabilities as a condition to obtaining research grants. Providing licensing freedom to faculty innovators would be one presumptive way to satisfy this requirement. Agencies overseeing the various federal labs—the Department of Energy in particular—also could require the labs to grant licensing freedom to their employee innovators. It is possible that these policy changes could be effected through regulations issued by the Department of Commerce, which has authority for implementing Bayh-Dole.

There is one significant point I want to underscore: *there is no need to change the Bayh-Dole Act itself or any other statute to implement these reforms.* Of course, Congress could move these reforms along—either in authorizing legislation or appropriations bills—by requiring agencies to adopt measures to encourage licensing reform.

I realize that there are objections to creating or encouraging a freer market in technology licensing, but I believe these can be readily addressed, and I would be happy to discuss them in detail if the Committee wishes. But at a broad level, I believe the critics can be best answered by asking a question of them: why only in the particular case of technology licensing, but not in the publication of research,

should faculty members not be able to choose the best method for advancing their innovation—especially when the exercise of choice does not disturb in any way the university's royalty or gain-sharing arrangement in the faculty member's contract? To be more precise, on what grounds can monopoly in this narrow sphere of activity be justified, when the presumption in virtually every other sphere of economic activity favors competition? At the very least, opponents to free agency would seem to have the burden of proof in carrying the day on each of these questions.

My colleague Lesa Mitchell, vice president for Advancing Innovation at Kauffman, has identified several other ways that federal agencies can speed up the commercialization process in recent Congressional testimony.[11] Here I will single out one of her ideas for special emphasis.

Whether or not Congress encourages universities and federal labs to grant their innovators greater licensing freedom (and whether or not these institutions adopt this reform on their own), the federal government should encourage and ideally help fund commercialization education of innovators at universities and federal labs. While many university star scientists have extensive entrepreneurial and/or licensing experience, others (especially first-timers) do not. This is one of the main justifications for having a centralized TLO.

But if entrepreneurial education and coaching is what is needed, it is not clear that TLOs are in the best position to provide these services. Rather, creative ways should be developed to bring in panels of outside, serial entrepreneurs to help university (and federal lab) innovators develop the commercial potential of their innovations and

[11] Testimony of Lesa Mitchell before the House Committee on Science and Technology, Subcommittee on Research and Science Education, June 10, 2010, available at www.kauffman.org.

to help them navigate their way through decisions whether to license the IP rights to existing firms or to start new firms. In particular, if the latter decision is made, faculty/lab innovators could profit from expert guidance about how to build and grow their companies, how to seek outside capital, how to build a management team, and so on. There are excellent examples of this kind of activity going on at certain universities already.

Federal agencies responsible for the research grants could add some modest additional funds for such training and mentoring, provided the university/lab sponsor has developed an appropriate plan for doing this. In addition, universities may want to band together to support a team of serial entrepreneurs who could help do this for faculty innovators at all participating institutions. The federal labs could do the same. There is no clear single right answer here, but some more creative thinking and multiple experiments would be helpful.

A third idea for accelerating commercialization at universities and/or federal labs I credit to another Kauffman colleague, Harold Bradley, who is chief investment officer at the Foundation. This idea would adopt an innovation by the “X Prize Foundation” and create several federal prizes for universities demonstrating great success in commercialization. “Success” could be defined by an index composed of measures representing the number of new firms launched, and the revenues realized and jobs created from these enterprises. In particular, one could envision a $1 million prize to the university demonstrating the greatest success each year, and perhaps a larger prize (say $5 million) for the best success measured over a five-year period. What is equally important is that the prize *not* be contingent on the traditional measures of TLO performance, notably patents generated and licensing income earned. The prize instead should reward what is most important for society and jobs—namely new firms created and measures of *their* incremental performance.

There is an extensive economics literature on the powerfully strong incentive effects created by prizes. The quest for the money and the fame stimulate far more activity than the amount of the prize itself. Also in creating such prizes, the federal government would indirectly encourage the other two commercialization reforms suggested here—more licensing freedom for and entrepreneurial education of innovators.

Boosting Formation and Growth of New Scale Firms

Not only are new firms generally important to the vitality of the economy and job growth, but new firms that "scale"—those that grow in revenues and jobs—are especially important. My Kauffman colleague Dane Stangler has documented from Census Department jobs data that the top 1 percent of all companies generate 40 percent of new jobs, and that the vast majority of these firms are no more than five years old. Furthermore, although the most rapidly growing young firms (those between ages three and five years) represent less than 1 percent of all companies in the economy, these few firms account for 10 percent of new jobs created each year.[12]

New firms, and the entrepreneurs who found them, also are vital parts of the innovation eco-system. Precisely because they are not tied to existing businesses, products, and services, new firms are responsible for a disproportionate share of the "radical" or "breakthrough" innovations that really drive growth. Think of the

[12] Dane Stangler, "High-Growth Firms and the Future of the American Economy," Kauffman Foundation, March 10, 2010 at www.kauffman.org.

automobile, the airplane, the computer revolutions, among other innovations—all were brought to the market by entrepreneurs, not by established firms.

The reforms for improving commercialization of academic innovations represent one set of ways for stimulating the growth of new scale firms. Another set of policies—those that affect how many skilled immigrants we let into this country—also would contribute significantly toward this objective.

It has been widely noted that for some time that a majority of the graduate students in science-related fields have been foreign students.[13] Some have been alarmed by this fact, arguing that it reflects either or both the lack of interest or excellence in science and math among native-born Americans.

Whether or not these factors are true, we should do much more to harness for the benefit of the U.S. economy and society, more broadly the creativity and entrepreneurial inclinations of foreign students who study here, many of whom work with faculty members receiving federal research grants. Vivek Wadhwa of Duke University and Anna Lee Saxenian of the University of California at Berkeley, among others, have documented that immigrants account for a disproportionate share of startups of successful high-tech companies, new enterprises generally, and patents. These immigrants bring both skills (often acquired at U.S. universities) and entrepreneurial drive to their efforts.

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[13] According to the National Science Foundation, "[f]oreign students received nearly 60 percent of all engineering doctorates awarded in the U.S. and over 50 percent of all doctorates in engineering, mathematics, computer sciences, physics, and economics." National Science Foundation, 2008, *Science and Engineering Indicators 2008* (based on data from 2005).

If we want more such companies—and clearly we do because they create jobs and wealth for other Americans—then some relatively straightforward changes in our immigration policies are in order.

The most ambitious reform that is attracting growing interest in the private sector and in Congress would be simply to staple green cards to all U.S. university diplomas handed out to foreign students. There are variations of this idea. Green cards could be attached to any kind of diploma in any subject, to undergraduate and/or graduate degrees, or to degrees in certain fields (science, technology, engineering and math, or STEM) which are likely to generate many, if not most, of the next big innovations.

If any version of the green card is viewed to be too politically risky, there is an obvious fallback that should not be, and that is to create a new “startup visa.” Senators Kerry and Lugar have proposed such a plan that would grant a temporary visa to entrepreneurs who receive at least $250,000 in outside financing and hire at least one non-family member, and then a green card once their enterprises employ at least five non-family members or earn at least $1 million in revenue. This is a good first step and certainly far better than the current EB-5 visa which is available only for up to 10,000 individuals who bring at least $1 million into the country and invest it in companies here (the threshold is $500,000 if the investment is in an economically distressed area). Even then, the EB-5 is only temporary, since it is valid for just two years.

But an even better entrepreneurs’ visa, in my view, would be based solely on jobs created here and not have any investment requirement, which many immigrants may not be able to meet. After all, what could be more important, especially in the current economic environment, than to encourage the formation of firms that actually hire Americans? Immigrants who thus establish enterprises here should receive an

immediate temporary visa, and then a time-limited visa, perhaps for five years, once they hire at least one non-family member. As in Kerry-Lugar, the visa should convert to a green card once the immigrant-entrepreneur hires some larger number of family-members (say five or 10).

There is an ample supply of immigrants who might qualify for a lengthened startup visa: the 1 million skilled foreign workers who are here now on temporary H1-B visas who otherwise must go home after six years, as well as the roughly 60,000 foreign students who each year earn a degree at an American university. These are far larger numbers than the relatively few individuals who could qualify for entry under the Kerry-Lugar proposal.

If, conservatively, roughly one in 10 of the H1-B's and foreign students launch a U.S. business—about the share of self-employed in this country among all workers—and each hire an employee, a true "job creators" visa could generate at least 100,000 new jobs. The number could be higher given immigrants' propensity to launch jobs at a greater rate than native-born Americans.

Moreover, since immigrants educated here or who already have skills from abroad are highly educated, the new businesses they launch are likely to be more technology-intensive than the typical business. This outcome is consistent with the need to accelerate the development and commercialization of innovation in this country.

Immigration reform for highly skilled workers, especially those with an entrepreneurial bent, is long overdue. We are competing in a global marketplace for ideas and talent. Other countries—notably Australia and Canada—have more liberal immigration policies for skilled individuals than we do. While the world benefits when these

individuals start or work for new business anywhere, they are likely to do best for us and for the world if we can give them to chance to launch their businesses here in the United States, since we still have the world's best entrepreneurial infrastructure. If we want to keep it that way, we need to be far more open to the world's best minds and talents than we are now.

Conclusion

In sum, continued federal support for research in academia and the federal labs is important for innovation, and has important economic benefits for the national economy and local economies. But at the same time, we will not maximize the benefits of this spending for society unless we do all we can to maximize the incentives for commercializing the innovations that this spending generates.

Our current innovation eco-system has clear limitations. These can and should be addressed as part of any national "innovation agenda." I have outlined some ideas here for doing so.

At the same time, our immigration laws should be changed to let in and keep precisely those skilled individuals who have a demonstrated record for turning new ideas into new companies, jobs and wealth for Americans.

Good economic outcomes make for good politics, especially when the measures available for achieving these outcomes cost little or no additional federal money.

Thank you for giving me the opportunity to appear before you today. I look forward to answering any questions.