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U.S. Policies on Innovation, Competitiveness, and Economic Recovery

AAAS Forum on Science and Technology

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Summary: Yesterday, April 29, 2009, marked President Obama's 100th day in office. Since President Franklin Roosevelt set the 100 day standard for whirlwind presidential accomplishments, subsequent presidents have all been subjected to what is an arbitrary yardstick. In his first 100 days, President Obama has traveled the world, set a timetable for troop withdrawal from Iraq, announced the closing of the Guantanamo Bay prison and signed a Fair Pay Act, and struggled with a staggering national financial crisis.

The question in this brief commentary asks a critical yet narrower question. How has the President done in terms of strengthening the country's innovation system, tackling key challenges for long-term economic competitiveness, while setting a course for nearer-term economic recovery?

In the April 27th speech to the National Academies, the President demonstrated a clear understanding of how important investments in the country's innovation system will be to the country's ability to meet key domestic and global challenges. In an earlier April 14th speech at Georgetown University, the President spelled out a "five pillars" approach to laying a "new foundation" for America's economic future. In that speech, he made clear his intent to lessen the burden of health care on American industry, to reverse the lagging performance of America's K-12 education system, and to develop new, sustainable, reliable, and affordable sources of energy.

The President's plan for recovery and reinvestment faces serious hurdles. The President is seeking recovery in the midst of restructuring at home and in a number of other key economies. Americans are starting to save again – good long-run news but an added challenge in the midst of an export limiting and private investment discouraging recession. The country must move from a recent past of large current account imbalances to current account balance if not surplus; a shift that will require painful adjustments in export dependent Asia and parts of Europe. From a reliance on profits in the financial sector – reaching 41% in 2007 – the country must shift to a new source of profit-making enterprises.

In seeking to recover and reinvest, the President is combining Keynes on fiscal policy, Friedman in the sense of an aggressive monetary policy, and growth theory by focusing on key investments. The President's approach is another clear example of the return to American pragmatism that, to borrow and adapt an English phrase, will use the right horses for a mix of courses.

There are also serious hurdles in fostering innovation. In moving from the laboratory to the market, the President will inevitably have to think about strengthening and advancing the manufacturing sector. Innovating for the civilian economy is more complicated than in the national security world where the government was the customer as well as the funder. Making progress in education, green energy, and health coverage and costs will require creative political leadership, effective partnerships with the private sector, universities, state and local governments, and the complicated web of organizations that make up civil society.

The Recovery: Chairman of the Federal Reserve Ben Bernanke, Secretary of the Treasury Tim Geithner, Director of the National Economic Council Larry Summers, and the President show a clear determination to keep the country and the world from falling into another Great Depression.

In terms of fiscal policy, the President and the Congress worked together to pass a $787 billion stimulus bill on the 25th day of his presidency. The scale of activity in the financial sector has been staggering. The TARP has been followed by the TALF and a mix of credits and guarantees which together have halted what seemed to be a collaping the financial system.

America's action has been complemented with fiscal, monetary, and institutional initiatives in the major countries and in some of the leading emerging markets as well. China has announced a fiscal stimulus that approaches $600 billion. While there is some debate over how much is new money, most estimates still see a significant investment in housing, health care, and infrastructure.

Japan and a number of European countries have taken similar steps in terms of stimulus and added their own doses of monetary stimulus by lowering short-term interest rates and, in some cases, moving to quantitative easing (i.e., printing money).

Just as in the United States, other major countries have injected capital into the banks, taken ownership positions, or, in some cases, moved to what is essentially nationalization.

What has this flurry of activity meant to the pace of innovation and long-term competitiveness? By restoring confidence, halting a precipitous decline, and laying the basis for eventual macroeconomic stability, the fiscal and monetary initiatives will create the conditions in which innovations can turn into investment, jobs, and economic growth.

Larry Summers made the right point in a 2008 speech at a dinner sponsored by the Science, Technology and Economy Program of the National Academies. He likened the macro economy to the role of the anesthesiologist in preparing for a serious operation: get it wrong and things can go seriously awry; get it right and you have prepared the path for the surgeon (or by analogy the scientist, the engineer, the venture capitalist, and the brilliant marketer) for a successful operation.

The Industrial Dimension: In terms of industry, the recovery has been largely, but not entirely, focused on the auto industry. In part the concern has been driven by fear that a traditional bankruptcy would throw hundreds of thousands, perhaps millions, of Americans out of work as car companies, their suppliers, a host of dealers, nearby businesses, and a host of communities add to a high and still rising rate of unemployment.

Looking at the auto industry through the lens of innovation and the growing concern about unsustainable current account deficits and record external debt, suggests other, important motives for helping the industry return to stable profitability. The traditional Big Three and even more, their large supplier chain, are important parts of the overall innovation system as well as the industrial base.

If we continue to move back to and eventually achieve current account balance (or even a period of current account surplus), the United States will be producing hundreds of billions of dollars of goods and services. In a very real sense, if we are to pay our way in the world, we need to pay attention to our manufacturing base.

The Commitment to Innovation: In the American Recovery and Reinvestment Act (ARRA) and in his stated intentions for the FY2010 budget, the Obama presidency promises to be good not only for science but for the entire innovation system. In his April 14 speech, he made his priorities clear: "...in tackling the deficit issues, we simply cannot sacrifice the long-term investments that we so desperately need to generate long-term prosperity." He was even more explicit about support for science in his April 27th speech: "At such a difficult moment, there are those who say...that support for research is is somehow a luxury." He went on to say that "science is more essential for our prosperity, our security, our health, our environment, and our quality of life than it has ever been."

In his April 27th speech to the National Academies, the President took what amounts to a system-wide approach to innovation, a systems approach that ranged from investments in basic science to K-12 education.

In terms of basic science, the President promised to complete the doubling of the budgets for the National Science Foundation, the Office of Science of the Department of Energy, and the National Institute of Standards and Technology, commitments first made by President George W. Bush in his 2006 State of the Union address.

The ARRA finally funded the American Competes Act and, more recently, the President promised added funds for the National Institutes of Heaith. In his April 27th speech, he emphasized the complementary role that physical and life sciences play in medical breakthroughs, an insight that has been emphasized in some of the earlier work of the STEP program of the National Academies.

The President also answered the" innovation for what" question by pointing to past innovations that ranged from the Internet to major medical discoveries. But, just as important, he imagined a future with "solar cells as cheap as paint, and green buildings that produce all the energy they consume; learning software as effective as a private tutor; prosthetics so advanced that you could play the piano again."

Nor does the President ignore the private sector. He proposes making the Research & Experimentation Tax Credit permanent, a $75 billion dollar commitment over the next five years.

The President's policies on innovation, on investments in basic science, on improving education in science, technology, engineering, and mathematics, and in proposing added grants for young researchers are all complements to his determination to rebuild the U.S. economy on a much firmer foundation.

The Five Pillars of the New Foundation: In his April 14th Georgetown speech, the President talked about five broad pillars to restore the economy. Two deal with creating an environment that is hospitable to innovation – setting new rules for Wall Street that eliminate (or at least seriously limit) the risks of another financial crisis and a commitment to bring down the debt burden for future generations.

Three of the pillars focus on major areas of American weakness in terms of long-term competitiveness: education, health care coverage and costs, and the long-run future of energy. In each case, particularly in the case of energy, President Obama looked to application of technology and the development of new technologies to help erect the three pillars.

Education: In education, the President is, again, taking a systems approach. In other forums, he has talked about policies that extend from cradle to career. Other advocates of life-long learning have spoken in terms of a system that extends from the "rocking horse to the rocking chair."

The United States continues to have a strong, often world-leading university and graduate school system. It is at the K-12 level that the country falls short. The April 29th newspapers carried the results of a recent survey by the National Assessment of Educational Progress (NAEP). Despite years of concern, despite the 1983 *Nation at Risk* report, despite President George H.W. Bush convening the third ever summit with the nation's governors, despite the extensive efforts by the world of business, and despite some examples of clear success, the nation shows virtually no progress in terms of student mastery of mathematics and science at the high school level.

International tests tell a similar story. American students lag behind their OECD peers as measured by the Program for International Student Assessment (PISA).

In his April 27th speech, the President highlighted his emphasis on early childhood education, turned to the governors to make STEM education a priority, and committed

funds to increase the number of National Science Foundation grants to younger researchers. And he set ambitious goals by setting 2020 as the date when America would again lead the world in the numbers of college graduates.

Just as important as specific dollars or the systems approach, the President seems sensitive to the role that inspiration can play. When speaking at the National Academies, he called on scientists, engineers, and others to show students "what it is that your work can mean" and couples that call with a joint program of DOE and NSF to inspire students to attack the problem of clean energy.

***Health Care Coverage and Costs*:** It has become commonplace to note that the United States spends much more on health care than other advanced economies yet does not achieve universal health care coverage or world leading results in several critical categories.

In terms of competitiveness, the United States carries an economic burden that is twice that of its major industrial competitors. The United States is also the only industrial country that developed a major, private sector funded health and pension system. As the burden has risen, American companies facing international competition have been placed at a growing disadvantage.

From a competitiveness point of view, the United States needs to take three initiatives with regard to health care. First, it needs to achieve universal coverage. In being flexible, mobile, and risk taking, Americans have some clear cultural strengths in terms of entrepreneurship. Fearing the loss of insurance or wondering if insurance will be denied for a pre-existing condition, many Americans stay with the current job rather than starting a new venture.

Second, the country must explore ways to control the costs of health care. Much of the debate focuses on how the mix of rising costs and an aging baby boomer cohort will create fiscal pressures in the not too distant future. But the question of cost remains – whether paid by individuals, companies, or the government. To the degree that high costs are due to systemic weaknesses, reform will free up money that could be used for productive investments as well as added consumption.

Third, particularly for businesses engaged in international competition, the United States needs to level the playing field for American business by reducing the burden of health care. Even with today's sharp drop in demand for cars, the American automobile industry would be in a much stronger position if individuals and the community as a whole carried the responsibility for health care.

Obama makes universal coverage and cost reduction priorities. To reduce costs, he proposes greater reliance on preventive medicine and the role of information technology in digitizing patient records.

Innovation could do more. Some research dollars could be explicitly targeted at reducing the cost of effective but highly expensive treatments. Information technology and the development of powerful computers has speeded the development of new, chemical compounds. Creative innovations in the tools for innovation will also help reduce costs over the long run.

Green Energy: Green energy is not only one of Obama's economic pillars but is the area where he has talked more extensively about the role of innovation. There is money for research ($150 billion over ten years). He supports funding for ARPA-E, a new institution for DOE inspired by the many successes of the Defense Advanced Research Projects Agency of the Department of Defense. ARPA-E faces an even bigger challenge: For DARPA the customer was always the Pentagon even if its innovations – like the Internet – eventually had enormous consequences for the overall economy. For ARPA-E, the country is the customer, with all the complexities that brings.

Generating new ideas, new innovations, prototypes, and pilot projects are important but even the most creative ideas do not necessarily create their own demand. Obama couples innovation with an attempt to create demand through, among other incentives, a cap and trade system that will gradually raise the price of carbon emissions.

The Challenges Ahead: Foreign policy can bring dangerous surprises. Think of the Bay of Pigs for President Kennedy, the quagmire of Viet Nam for President Johnson, the hostage crisis under President Carter, the Iran Contra affairs under President Reagan, and the 9/11 attacks on the Pentagon and New York's twin towers that transformed the presidency of George W. Bush. As this essay is being writing, the world's attention is shifting to a troubled Pakistan the threat of swine flu pandemic.

There are no lack of changes and looming uncertainties in the economic sphere. As noted above, the President is seeking national recovery and world recovery at the same time. The push for recovery comes at a time when the United States and other economies must undergo serious structural changes.

In the United States, the personal savings rate has gone from slightly negative in mid-2008 to a recent level of 5% of personal income. A generation ago, the savings rate was between 8 and 9%. As consumers continue to deleverage (pay off their credit cards, reduce home equity loans, or refinance their mortgage) and seek to restore lost wealth, the savings rate could certainly rise to 10%. Higher personal savings is very good news for the long run, but with exports weak and private investment sluggish, higher savings will put pressure on the government to continue spending as political opposition to deficits is expected to rise.

Moving from persistent current account deficits to balance or even to a period of surplus will require considerable adjustment in the United States, Asia, and Europe, particularly Germany. In terms of Germany, Chancellor Merkel has already said, in effect, that Germany is an exporting power and will remain so. Neither China nor Japan appear ready to make a permanent shift toward domestic spending.

While the current focus of economists and central bankers is on deflation or the overall decline in the price level, some investors are already wondering if the combination of fiscal stimulus and the printing of large amounts of money will eventually trigger a run of inflation. With corporate and financial sectors going through a major deleveraging, in effect reducing the pace at which money is spent and borrowed, the risks of inflation are limited. But even the fear of rising prices can have an effect on investment, including investment in innovations.

Conclusion: The President and his team are determined to foster a recovery at home and are working to restore world growth in concert with other leading economies. A higher personal savings rate may complicate his near-term success as may a rise in investor concern about inflation.

The President has taken a solid, systems approach to innovation with initiatives that support investments in basic research, improved STEM education, and include new institutions such as ARPA-E. They hold promise of bolstering long-term productivity growth while helping achieve key priorities in education, health care, and clean energy.

There are some areas that will benefit from added emphasis in future policy speeches. Manufacturing and the industrial base should be emphasized both for their role in the innovation system and as a target for research dollars to support ever more advanced engineering. The President and his team will also need to spell out how research and development can best move from idea to innovation to investment and high-wage jobs. Reducing and then eliminating the current account deficit will be very good for innovation but will involve difficult, international diplomacy.

As basic research becomes more global and as more countries become successful innovators, the United States will need a strategy to engage in international collaboration in a way that will bring it a fair share of the benefits. To make the most of the growing flow of overseas inventions, the United States will need to become a faster follower (and quick adapter and adopter) as well as a traditional first mover.

Final Thought: On April 27th the President warned us that "there will be no single Sputnik moment for this generation's challenge to break our dependence on fossil fuels." He responds by announcing a public campaign and the need to engage young Americans. The members and guests of AAAS can be role models for the young, advocates for investments in science, and a political force for an innovative America.

Countries get what they celebrate. We are awash in technology and yet seem to lack a popular curiosity about who invented it, who made it, or how it works. Periodically, the President presents medals for science and technology honoring brilliant, creative individuals who have made stunning discoveries. Yet, too often, the events and the individuals are given little attention in the national press.

We need to build a country where when we say Paris, we do not think first of Paris Hilton but rather of the Paris that is home to French art and science; we need a country where when we hear Britney we do not think first of Britney Spears, the pop icon, but instead dream of a journey to Brittany, that innovation inspiring Celtic outpost on the coast of France. And that change of culture, that celebration of invention and innovation is a challenge that belongs to the President and to us all.