# Timely, Targeted, Temporary and Transformative: Crafting an Innovation-Based Economic Stimulus Package

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*In an economy which faces key challenges in the moderate to long term in areas such as the need to increase international competitiveness, raise productivity, and reduce greenhouse gas emissions, any stimulus package should also at least in part help address these challenges.*

As talk of a possible recession grows, so too does consideration of a second economic fiscal stimulus package. Rather than craft a conventional spending-oriented stimulus package focused solely on tax cuts for individuals and spending increases, Congress should craft a stimulus package of which at least a portion not only gives a quick shot in the arm to the economy but at the same time also boosts investments that spur productivity growth and innovation, especially in information and communication technology, which has been the engine of U.S. economic growth for the past decade.

In the past, the standard approach to heading off recessions through fiscal policy was Keynesian pump-priming – stimulating consumption through a range of temporary government spending increases and/or tax cuts and rebates. Whether such pump-priming did anything more than spur consumer spending – such as boost productivity or innovation – was beside the point. The sole focus was to get a lagging economy moving again.

But in an economy which also faces key challenges going forward in the moderate to long term in areas such as the need to increase international competitiveness, raise productivity, and reduce greenhouse gas emissions, any stimulus package should also at least in part help address these challenges. Indeed, in an era of increased international economic competition, we can no longer afford a "consumption-based" stimulus package that leaves the nation with little to show after consumers spend the money and the economy gets back on track. It's not enough to just consider the amount of short-term "bang for the buck" that any stimulus will create, policymakers need to also consider what kind of long-term "bang for the buck" it creates. For if two measures create equal stimulus in the short run, but one also leads to investments that boost productivity, innovation or energy savings for years into the future, the latter is clearly superior.

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Federal Reserve Chairman Bernanke acknowledged as much when in recent House testimony on the stimulus package he stated that investments in human capital, education, research and development, new technologies, energy, and infrastructure were important for long-term growth.[1]

Yet, to date, virtually all discussion of a second stimulus package has been focused on questions of ensuring that the provisions are timely (e.g., take effect over the next year or so), targeted (focused on activities that have relatively high economic multipliers), and temporary (expire when the slowdown is over).[2] While these three considerations are critical, it is equally important to ask whether some measures cannot also be "transformative;" that is, whether measures boost investments that in turn will spur growth and innovation long after the initial spending has done its work of creating economic demand and jobs. There are in fact a number of areas that meet these criteria of being timely, targeted, and temporary, while also being transformative in their impact on innovation and productivity. As a result, Congress should include in the stimulus package the following measures:

1. Allow IT Investments to be Completely Expensed in 2009
2. Provide a Tax Credit for Investments in Health IT Made in 2009
3. Provide $2 Billion to Colleges and Universities That Invest in Needed Research Infrastructure in 2009
4. Provide a Tax Credit of 50 Percent for Investments in Energy Efficient Equipment in 2009
5. Provide $1.6 Billion for Computers and Broadband for Low-Income Families with Children at Home
6. Provide an $8 Billion One-Time Infusion into the Highway Trust Fund to Spur Ready-to-Go Surface Transportation Infrastructure Investments
7. Allow U.S. Companies to Bring Back Foreign Earnings at a Lower Corporate Tax Rate in 2009
8. Provide Forgivable Loans to States to Shore Up Budget Shortfalls, Provided That States Expand "Rainy Day" Funds in Later Years

### 1. ALLOW INFORMATION TECHNOLOGY INVESTMENTS TO BE COMPLETELY EXPENSED IN 2009

IT investments produce outsized productivity gains, spurring higher company productivity and higher real wages.[3] Companies in the United States invest around $400 billion per year in IT equipment and software, but these investments must be depreciated over a number of years. Allowing companies to write off all the costs for tax purposes in 2009 would raise the rate of return of new equipment and software, spurring companies to invest more and more rapidly turn over older, less productive equipment and software. As a result, companies would not only boost their productivity and international competitiveness, they would be installing equipment that would be both safer for workers using it and more energy efficient.

While some will argue that investment tax incentives will have little or no effect until consumer demand starts to grow and companies ramp up production to meet this demand, this mischaracterizes the impact of expensing. For while it is true that companies may not expand overall capital equipment levels until sales of goods or services start to expand, companies will replace old equipment with new, even if they do not see sales rising, as long as they believe that the new equipment will perform better than old and that the rate of return on the investment is adequate. Allowing companies to expense IT investments will make more investments turn the corner on profitability, leading them to expand investments.

### 2. PROVIDE A TAX CREDIT FOR INVESTMENTS IN HEALTH INFORMATION TECHNOLOGY MADE IN 2009

Information technology promises to revolutionize health care by improving the quality and containing the costs of care. For the American health care system to benefit from advances in IT, it must adopt electronic health records (EHRs), electronic prescribing, telemedicine and other technology applications.[4]

But compared to other nations, the United States lags significantly behind in the adoption of health IT. Estimates show that less than 10 percent of doctors use a "fully operational" system that "collects patient infor-

mation, displays test results, allows providers to enter medical orders and prescriptions, and helps doctors make treatment decisions" and perhaps only five percent of hospitals have fully implemented a computerized physician order entry system, a key tool used to improve patient safety.[5]

One major barrier to adoption is that many of the benefits of EHR adoption go to parties other than the implementers - doctors and hospitals. Rather, many of the benefits inure to patients and insurers. To help overcome this market failure, Congress should provide a special one-time tax credit during the first half of 2009 to incentivize health care providers to invest in this technology. First, Congress should provide a tax credit of 40 percent of the costs of investments made by hospitals or doctors in "fully functional" EHR systems that meet the four requirements of the Office of the National Coordinator for Health Information Technology in the Department of Health and Human Services.[6] In addition, Congress should provide a tax credit of 25 percent of the costs of other qualified health IT investments, including e-prescribing systems, telemedicine equipment, and other basic EHR systems. Doing so could jump-start investment in health IT and get us closer to the needed "tipping point" where health IT is widespread and standard.

### 3. PROVIDE $2 BILLION TO COLLEGES AND UNIVERSITIES THAT INVEST IN NEEDED RESEARCH INFRASTRUCTURE IN 2009

Research universities are a key component of the innovation economy.[7] But to play that role effectively, they need state-of-the-art research equipment, such as DNA analysis equipment for cancer research, nanoengineering research facilities for new materials and systems, and supercomputers to create virtual reality environments. Unfortunately, the National Science Board reports, "Over the past decade, the funding for academic research infrastructure has not kept pace with rapidly changing technology, expanding research opportunities, and increasing numbers of users."[8] As a result, they recommend that Congress appropriate an additional $2 billion per year to provide scientists and engineers with advanced tools, facilities, and cyberinfrastructure. As part of the stimulus package Congress should appropriate $2 billion to the National Science Foundation (NSF) for grants to cover 90 percent of the costs of purchases made by universities in 2009 of research equipment. To implement this, NSF would be required to issue an RFP within one month of the signing of any stimulus measure and universities and colleges would have one month after that to submit applications for funding. Awards would be made within one month of that, and colleges and universities would have to place an order for the equipment within two months of receiving the award (which they must match with at least 10 percent of funding from other sources).

### 4. PROVIDE A TAX CREDIT OF 50 PERCENT FOR INVESTMENTS IN ENERGY EFFICIENT EQUIPMENT

Current law provides modest tax incentives to businesses and homeowners to install energy saving equipment.[9] However more generous, one-time incentives could spur significant investments in 2009, saving energy and creating jobs. Toward that end, Congress should double the energy efficient home improvement tax credits extended by the Emergency Economic Stabilization Act for investments made in 2009.[10] Likewise, they should provide businesses with tax credits for purchases of energy efficient equipment, such as low energy consuming servers and computers. In addition, Congress should provide a tax credit of 50 percent for companies that reduce their data center power consumption by 15 percent for qualified expenses including virtualization and consolidation, energy-efficient CPUs, energy-efficient computer power supplies, and server racks with improved airflow.[11]

### 5. ALLOCATE $1.6 BILLION TO FUND COMPUTERS AND BROADBAND FOR EDUCATIONAL OPPORTUNITY

There is increasing evidence that having an Internet-connected computer at home increases education performance.[12] Yet, as of 2007 approximately one quarter of American households with children under the age of 18 did not have an Internet-connected computer at home. And for children living in hoseholds with incomes less than $30,000, 49 percent did not own a computer in their homes.[13] Moreover, not having a computer at home is one of the major factors limiting broadband take up in the United States and is a reason why the United States ranks just 15th in broadband adoption of the 30 OECD nations.[14]

To spur broadband deployment and computer adoption among families with children, Congress should allocate $1.6 billion to help over 1 million low income households afford to purchase a computer and get subsidized broadband service for one year.[15] This program could be administered by the Universal Service Administrative Company (USAC), which currently is charged with administrating the subsidy program to help low income individuals and families afford the price of telephone installation and monthly charges.[16] Currently, it provides a subsidy of 50 percent of the cost of installing a phone and about the same rate of subsidy for basic monthly telephone service. To qualify for the broadband program, individuals would have to qualify for the Lifeline/Linkup program and have at least one child under the age of 18 living at home. As with the Lifeline/Linkup program, broadband service providers would be the ones to directly relate to consumers, and would submit reimbursements to the USAC for half the costs of the computers they sell to customers and monthly broadband services for one year. In this case, the money would be first-come, first-serve. In addition, groups such as ConnectedNation and One Economy that work to bring digital opportunity to disadvantaged communities and individuals could market the program to individuals that they work with.

### 6. PROVIDE A ONE-TIME $8 BILLION INFUSION INTO THE HIGHWAY TRUST FUND TO SPUR READY-TO-GO SURFACE TRANSPORTATION INFRASTRUCTURE INVESTMENTS

Our nation's surface transportation infrastructure (roads, bridges and transit) is in disrepair and has not kept up with increased demand by consumers and businesses. Increased funding for transportation infrastructure would boost economic growth by raising productivity among businesses and mobility among consumers. While some infrastructure projects would take a relatively long time to build, according to the American Association of State Highway and Transportation Officials, there are approximately $17 billion in projects that could be initiated within 6 months of funding. Given that the trust fund is "owed" approximately $8 billion for past trust fund diversions to the general fund, it makes sense to use this opportunity to allocate $8 billion to spur needed infrastructure investments.

### 7. ALLOW U.S. COMPANIES TO BRING BACK FOREIGN EARNINGS AT A LOWER CORPORATE TAX RATE IN 2009

Under current tax law, U.S. companies can earn profits overseas that are taxed at lower rates in the countries in which they are earned. Because the U.S. corporate rate is higher than in many other nations, U.S. multinational firms have built up considerable profits that they have not repatriated to the United States since doing so would mean that they would be taxed at the higher U.S. rate. As a result, capital has accumulated in other nations leading to economic benefits accruing there. Allowing companies to bring this money back into the U.S. economy through a temporary, reduced tax rate would lead to an additional stimulus.

*Allowing companies to expense IT investments will make more investments turn the corner on profitabiltiy, leading them to increase their IT investments.*

Bringing back this capital, regardless of how it is invested, creates a short term economic stimulus as the funds are infused into the economy. In fact, evidence suggests that encouraging domestic investment regardless of how the funds are used is associated with domestic job creation while investment in foreign affiliates reduces domestic employment, at least in manufacturing.[17] But a not insignificant portion of any repatriated funds are also likely to be invested in innovation-based activities that also spur longer term growth. An analysis of the uses of the profits repatriated after the passage of the 2004 American Job Creation Act found that 25 percent of the $360 billion in repatriated funds went to domestic capital investment, while 14 percent went to research and development, both areas that not only spur economic expansion in the short run, but growth and innovation in the long run.[18]

### 8. PROVIDE FORGIVABLE LOANS TO STATES TO SHORE UP BUDGET SHORTFALLS, PROVIDED THAT STATES EXPAND "RAINY DAY" FUNDS IN LATER YEARS

State budgets make up a larger share of national GDP today than they did 25 years ago.[19] And because every state but Vermont is required constitutionally to run

balanced budgets, a large number of states are now planning to cut expenditures, a step that will only exacerbate the current downward economic trend. States would not have to do this if they instead drew down robust "rainy day" funds that they have built up during good times. Unfortunately, few states have sufficient rainy day funds, in large part because there is little political advantage for elected officials, especially governors, to expand government savings, especially if these savings will be drawn down in the next governor's term. This is why in the recession of 2001 state budget shortfalls were six times greater than rainy day fund reserves.[20] And the situation has only gotten worse. In 2006 state rainy day reserves were half what they were going into the last recession. States simply are not politically capable of running the kinds of budget reserves that are needed so that their budgetary reactions do not make national economic downturns even deeper and longer.

As a result states need help in being fiscally responsible. To do this, any stimulus package should provide general aid to state governments, but in the form of forgivable loans. In order to not have to pay back the loan, a state would have to increase its rainy day fund to at least 5 percent of its budget within five years of the recession officially ending. States that fail to do this or that drew down their rainy day funds after this without Treasury approval would be required to pay back the loan to the federal government.

Such a proposal would give states real incentives to build up rainy day funds and to spend them when the nation is at risk of a recession. While adding this provision to any state aid grants made as part of the stimulus package would not have an economic impact now, it would have a positive impact in limiting any future slowdowns.

## QUESTIONS REGARDING AN INNOVATION-BASED STIMULUS PACKAGE

**1) Will these investments be timely?** Any stimulus measure should ideally spur new economic activity while the economy is underperforming. This is one reason why many policymakers have favored measures like tax rebates mailed to consumers. They can be issued fairly quickly and consumers can spend them expeditiously. However, all the measures proposed here can be structured to provide incentives for additional investments to occur in 2009, and if desired, even in the first half of 2009.

**2) Will these investments be targeted?** Any stimulus measure should ideally spur new economic activity that leads to investment or spending that in turn creates jobs. If most of a stimulus measure, for example, goes to savings, its benefit on jobs will be less than one where most goes to spending or investment. But all of the measures proposed here would be directly related to investments (purchases of goods or services) that would directly create jobs. But unlike measures such as tax rebates mailed to consumers, these measures would create a more productive and innovative economy, producing benefits long after the initial monies are invested.

A related concern is that some of these investments would leak out of the U.S. economy by spurring imports, thereby reducing the multiplier effect and weakening the direct stimulus to the U.S. economy. In a global economy where a much larger share of the U.S. economy is traded, this is a challenge for most stimulus measures. Broad-based stimulus measures such as consumer tax rebates are just as likely, if not more likely, to be spent on imports than the kinds of targeted measures proposed above. For example, in 2007, 14.2 percent of GDP was spent on imports. It can be assumed a similiar amount of any general stimulus would leak out of the nation.

**3) Will these investments be temporary?** Any stimulus measure should ideally be in effect for only the period of economic downturn and not continue past that. Some measures such as one-time consumer rebate checks are clearly temporary. Others, including the proposals listed above, can easily be crafted to be temporary.

## CONCLUSION

This kind of "transformative" stimulus package marries some of the best insights of neo-Keynesian economics with prescriptions from an emerging field of economic growth theory – innovation economics –

that argues that technology, entrepreneurship, and innovation are central components of driving economic growth.[21] Keynes' insight that governments can encourage economic rebounds by stimulating aggregate demand through government spending or tax cuts has merit as a short term economic strategy, but it can and must be paired with a strategy to return the United States to long-term economic strength.

Within this crisis lies the opportunity to apply constructive insights from neo-Keynesian theory and then transition to a new economic understanding that both incorporates the best lessons of its forbearers and charts a path forward in an increasingly global, knowledge- and technology-based economy. And indeed, given the likely limits on the federal budget going forward, the reality is that this may not only be a good opportunity to enact an innovation-based economic agenda, it might be our only opportunity, at least for the foreseeable future.

## ENDNOTES

1. Federal Reserve Chairman, Benjamin S. Bernanke's remarks made at the House Budget Committee hearing on "Economic Recovery: Options and Challenges," October 20, 2008 <budget.house.gov/hearings.aspx#081020>.

2. For example, Federal Reserve Chairman Ben Bernanke testified before Congress that, "Any fiscal package should be well-targeted, in the sense of attempting to maximize the beneficial effects on spending and activity per dollar of increased federal expenditure or lost revenue."

3. Robert D. Atkinson and Andrew S. McKay, *Digital Prosperity: Understanding the Economic Benefits of the Information Technology Revolution* (Washington, D.C.: Information Technology and Innovation Foundation, March 2007) <www.itif.org/files/digital_prosperity.pdf> and Stephen Rose, *Does Productivity Growth Still Benefit Working Americans?: Unraveling the Income Growth Mystery to Determine How Much Median Incomes Trail Productivity Growth* (Washington, D.C.: Information Technology and Innovation Foundation, June 2007) <www.itif.org/files/DoesProductivityGrowthStillBenefitWorkingAmericans.pdf>.

4. An EHR contains the complete medical history of a patient, including a full listing of illnesses, laboratory tests, treatments, drugs administered, and allergies.

5. Daniel Castro, *Improving Health Care: Why a Dose of IT May Be Just What the Doctor Ordered* (Washington, D.C.: The Information Technology and Innovation Foundation, October 2007) <www.itif.org/files/HealthIT.pdf >.

6. Catherine M. DesRoches, et al., "Electronic Health Records in Ambulatory Care — A National Survey of Physicians," *The New England Journal of Medicine* 359 (2008): 50-60.

7. Fred Block and Matthew R. Keller, *Where Do Innovations Come From? Transformations in the U.S. National Innovation System, 1970-2006* (Washington, D.C.: Information Technology and Innovation Foundation, July 2008) <www.itif.org/files/Where_do_innovations_come_from.pdf>.

8. The National Science Board Website <www.nsf.gov/nsb/> (accessed October 27, 2008). Another indicator of this is that federal funding for R&D Plant is down to $3.6 billion in 2007 from $4.5 billion in 2000. (In constant 2000 dollars this equates to roughly $3.0 billion). Melissa Pollak, "Federal R&D Funding Down in FY 2007," National Science Foundation: Arlington, VA, February 2008 <www.nsf.gov/statistics/infbrief/nsf08303/nsf08303.pdf> (accessed October 28, 2008).

9. Section 102. Extension and modification of the solar energy and fuel cell investment tax credit ("ITC") (IRC Section 48). Under current law, taxpayers can claim a 30 percent business energy credit for purchases of qualified solar energy property and qualified fuel cell power plants. In addition, a 10 percent credit for purchase of qualifying stationary microturbine power plants is available. The credit for qualified fuel cell power plant property is capped at $500 per 0.5 kilowatt of capacity. Credits apply to periods after December 31, 2005 and before January 1, 2008. The current stimulus package extended the 179D deduction for investments in energy efficient homes and buildings.

10. The credit varies based on the home improvement. So for example, Geo-Thermal Heat Pumps get a 30 percent credit, up to $2000; insulation gets a 10 percent credit up to $500, and qualified air circulating fans just get a flat $50 credit.

11. According to a survey by Voltaire Ltd., moving to green data centers is a priority for 90 percent of senior IT executives (surveyed at the 2008 MIT Sloan CIO Symposium), but most do not have a committed budget for it. Voltaire, "Networked Computing Infrastructure for the Next Generation Data Center," September 3, 2008 <www.voltaire.com/NewsAndEvents/Press_Releases/press2008/Voltaire_Survey_Shows_IT_Executives_See_Greening_of_Data_Center_as_Mission-Critical_But_Lack_Green> (accessed October 27, 2008).

12. The best evidence of the importance of computers in education is documented by Jackson et al. (2004). They find that home Internet use for children between 10 and 18 improved performance on standardized reading tests, likely because Internet usage depends so heavily on reading text. Linda A. Jackson, et al., "Does Home Internet Use Influence the Academic Performance of Low-Income Children?" Developmental Psychology 42(3) (2006): 429 <www.apa.org/releases/dev423-jackson.

pdf> (accessed July 20, 2008). In 2005, Fairlie concluded that, after controlling for family income, parental education and occupation as well as other factors, a home computer improves the chances that a teenager is enrolled in school. Robert Fairlie, "The Effects of Home Computers on School Enrollment," Economics of Education Review 24 (2005): 533 <people.ucsc.edu/~rfairlie/papers/published/eer%202005%20-%20computers%20and%20school.pdf> (accessed July 20, 2008).

13. U.S. Census Bureau, "Computer and Internet Use in the Uniated States: October 2003" <www.census.gov/population/www/socdemo/computer/2003.html> (accessed October 27, 2008).

14. Robert D. Atkinson, Daniel K. Correa, and Julie A. Hedlund, *Explaining International Broadband Leadership* (Washington, D.C.: Information Technology and Innovation Foundation, May 2008).

15. This is based on the following calculations. The program pays half the costs of purchasing a computer (estimated at $200 for the share and $400 total) and $10 per month subsidy for broadband services.

16. Telephone Assistance Programs for Low Income Households, Universal Service Administrative Company Website <www.lifelinesupport.org/li/low-income/lifelinesupport/browser/Default.aspx> (accessed October 27, 2008).

17. Anne E. Harrison and Margaret S. McMillan, "Dispelling Some Myths About Offshoring," UC Berkeley, Berkeley, California, September 2006 <are.berkeley.edu/~harrison/Dispelling%20some%20Myths....pdf> (accessed October 27, 2008).

18. John R. Graham, Michelle Hanlon, and Terry Shevlin, "Barriers to Mobility: The Lockout Effect of U.S. Taxation of Worldwide Corporate Profits," paper written for presentation at the conference entitled "Mobility and Tax Policy: Do Yesterday's Taxes Fit Tomorrow's Economy?" at the University of Tennessee, October 3, 2008. This is also consistent with Morrow who found that "firms who repatriated dividends in 2005 under §965 increased spending on permitted investments when compared to those who did not repatriate dividends." Michaele L. Morrow, "Tax Incentives and Domestic Investment: An Empirical Analysis of the Repatriation Decisions of U.S. Multinational Corporations Following the Implementation of the Homeland Investment Act of 2004," A Dissertation In Business Adminitration – Accounting, Submitted to the Graduate Faculty of Texas Tech University in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy, Texas Tech University, Lubbock, Texas, May 2008 <etd.lib.ttu.edu/theses/available/etd-03162008-222833/unrestricted/morrow_michaele_diss.pdf> (accessed October 27, 2008).

19. In 2006, state budgets accounted for approximately 13.6 percent of GDP, whereas in 1981 they accounted for 11.6 percent.

20. Elaine Maag and Alison McCarthy, "Tax Anaylsis: Tax Facts," Tax Policy Center: Washington, D.C., October 2, 2006 <www.urban.org/UploadedPDF/1001024_Tax_Facts_10-02-06.pdf> (accessed October 27, 2008).

21. Robert D. Atkinson and David B. Audretsch, *Economic Doctrines and Policy Differences: Has the Washington Policy Debate Been Asking the Wrong Questions?* (Washington, D.C.: Information Technology and Innovation Foundation, September 2008) <www.itif.org/files/EconomicDoctrine.pdf>.

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