

## **Encouraging Innovation and the Role of Tax Policy**

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Thank you to the International Tax Policy Forum and the Georgetown University Law Center for inviting me to speak at the conference today. The need to foster greater innovation and productivity growth is one of the most important economic challenges we face, and tax policy is one of several important levers that policymakers can use. It is critical that we deploy these policy tools wisely—which is what I would like to discuss with you today.

It is my belief that if done correctly business tax reform has the potential to increase innovation in a cost effective manner, for example by expanding the research and development credit as part of a broader reform. But done the wrong way, tax reform risks compounding some of the existing problems our tax system has with the taxation of overseas income while providing too little incentive for additional innovation to justify the cost. As I will discuss, those are the reasons why the Administration views an “innovation box” or similar proposal as a step in the wrong direction.

The United States is in the middle of a sustained economic expansion—we have added 14.3 million private sector jobs over a record 72 straight months of job growth, the unemployment rate is half of what it was nearly six years ago, and a broad set of measures indicate that wage growth has picked up from its pace earlier in the expansion.

But the decades-long track record of income growth is worrying. Median income rose about 3 percent annually from 1948 to 1973 but has only risen 0.1 percent annually since 1973 according to the official Census statistics (or about 1 percent after adjusting for changes in family size, employee benefit growth, and other factors).

Rising inequality and declining growth in labor force participation have played a role in the slowdown of median income growth since the 1970s, but the single most important factor has been the slowdown in productivity growth. In fact, if the productivity growth rate since 1973 had matched its growth rate from the previous twenty-five years, incomes would have been 58 percent higher in 2014, and the median household would have an additional \$31,000 in income, all else being equal.

### **The Sources and Evolution of Productivity Growth**

Productivity growth is critical to the well-being of the American economy, its workers, and its households. Growth in labor productivity means American workers generate more output

for a given amount of work, which can lead to higher living standards via higher wages, lower prices, and a greater variety of innovative products. However even though the United States has led other major advanced countries in labor productivity growth over the past decade, achieving robust measured productivity growth has been a substantial challenge.

Labor productivity growth—measured as output per hour—comes from three sources: increases in capital, improvements in the quality of labor, and higher “total factor productivity” or TFP. The first source—the accumulation of physical capital—fuels labor productivity growth through investments in machines, tools, computers, factories, infrastructure, and other items that enable workers to increase the amount they produce and the type of output they can create. The second source, labor quality improvements, comes from greater education and training of the workers who operate these machines, tools, and computers, manage factories and infrastructure, develop marketing strategies and serve customers, to produce and sell output. Rapid increases in capital accumulation or educational attainment can increase the output per hour of an economy. There are, however, generally limits to the extent of productivity gains that can result from simply piling more resources (physical or human capital) into the production process.

The most important source of overall productivity growth is the third factor—total factor productivity. TFP can be thought of as the way that labor and capital come together to produce output and depends on the level of technology, how firms are managed, and the organization of the production process. For example, TFP would be higher if we could take the same workers and the same equipment and by changing the way that the workers use the equipment get more output. Increases in TFP accounted for over half of the growth in productivity between 1948 and 2014. Moreover, variations in TFP also explain most of the variations in productivity growth over longer periods, as the contributions of capital and labor quality have been roughly constant (although recently, the contribution from capital has decreased significantly)<sup>1</sup>.

This is why it is so important to have public policies that are focused not just on increasing business investment and worker skills, but also on more fundamental innovation, as measured by TFP, which is essential if we want to see faster growth in middle class incomes.

## **Innovation Policy and the Government’s Role**

The private sector plays a central role in innovation. But, because it does not capture all of the positive externalities created by this activity, the private sector would produce substantially less innovation than would be economically efficient. As a result, government policy has a critical role to play in helping to drive innovation, including by directly contributing inputs to the innovation process and by improving incentives for innovators.

Some of the important roles government plays include: (i) pro-competition policies, (ii) an efficient intellectual property rights regime, (iii) direct investment in R&D, and (iv) tax policies that lead firms to internalize more of the society-wide benefits from R&D. I will discuss these in turn, focusing especially on the last.

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<sup>1</sup> For more detail, see pages 7 to 9 of Chairman Jason Furman’s July 9, 2015 speech entitled “Productivity Growth in the Advanced Economies: The Past, the Present, and Lessons for the Future.”

## *Competition*

Competition from new and existing firms plays an important role in the creation and adoption of new technologies and innovations. Startups are a critical pathway for the commercialization of innovative new ideas and products. Startups, or the possibility of entry by a startup, also increases incentives for established firms to innovate and reduce costs. More than 50 years ago, the Nobel Prize-winning economist Kenneth Arrow (1962) argued that a monopolist may have relatively weak incentives to innovate, since its innovations do not allow it to “steal” business from competitors. On the other hand, competition pushes firms to invest in new technologies and innovations that help to lower costs and improve the quality of existing products.

Competition is particularly important given that the rates of new business entry and of existing business exit have both declined steadily since the 1970s, in part reflecting the growing power of large incumbent firms. The government has an important role to play in making sure that incumbent firms play by the rules. Competition is also a consideration in business tax reform, which should generally be geared at promoting new investment and being conducive to the operations of small businesses, not just designed around providing large benefits for entrenched incumbents.

## *Intellectual Property Rights*

While competition is essential to short-run efficiency and can also play an often underappreciated role in dynamic efficiency, in some cases the temporary protection of incumbents can promote socially beneficial innovation, which is why we grant temporary monopoly power for patents and copyrights. Legal regimes for intellectual property, however, face the inherent challenge of trading off short- and long-run innovation incentives.

A long line of research (e.g., Moser 2005; Mokyr 2009) validates the need for government to protect property rights and reward innovators and creators with patents, copyrights, or trademarks. The Constitution itself recognizes that protection of intellectual property amounts to good public policy, giving Congress the power, for example, “to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.”

But we also know that an inefficient IP regime can get in the way of innovation, as when, for example, frivolous patent demand letters and lawsuits compel companies to pay settlements simply to avoid incurring the substantial costs (in time and money) that these companies would have to devote to defending against overly broad patent claims. Such inefficiencies can stifle innovation and growth, limit competition and reduce the follow-on innovations that come from combining and building on new ideas (Williams 2013; Cohen et al. 2014; Scott Morton and Shapiro 2015). All this points to the need for a healthy, well-functioning IP regime. For these reasons, the Administration supports further reforms that build on the America Invents Act of 2011 and encourage innovation.

## *Public Investments in R&D*

Public financing of innovation, via federally-funded R&D, offers a way around this tradeoff between short- and long-run efficiency, while shifting the financing of innovation from consumers to taxpayers—that is, it avoids the higher consumer prices we pay as a result of temporary IP monopolies—and instead invests in innovation using the taxes we pay.

Basic research often has great social value because of its broad applicability. However, because it is difficult for a private firm to appropriate the gains from basic research, they tend not to invest in basic research (and applied research and experimental development) at socially optimal levels (Nelson 1959).

Recent empirical analyses that attempt to measure spillover effects suggest that the socially optimal level of R&D investment—the amount that would produce the greatest rate of economic growth—is two to four times greater than actual spending (Jones and Williams 1998; Bloom, Schankerman, and Van Reenen 2013), and that underinvestment is particularly acute in the area of basic research (Akcigit et al. 2012), since its role in providing the basic building blocks of future innovations means that it generates the largest spillovers.

Public financing of innovation, via federally-funded R&D, has generally been declining as a share of GDP since the 1960s, a fact that is particularly concerning because the government is responsible for 55 percent of the more basic research (as compared with only 22 percent of the more applied development). So further increases in public investment are critical. That is why the President has proposed to increase investment in basic science, advanced manufacturing, cybersecurity, energy efficiency, and medical science. Specifically, the President's FY2017 budget proposes a four percent increase in overall R&D funding from 2016.

## **Tax Policy and Innovation: The Research and Experimentation Credit vs. an Innovation Box**

While direct government financing is responsible for the majority of basic research, businesses also play an important role in basic research and a dominant role in more applied research. In that respect it is notable that 2015 was the best year for private R&D growth since 2008, resulting in private R&D being the highest ever as a share of GDP. But the same spillovers that create a role for government policy in making direct investments in research also create a role for the government in providing the right incentives for an efficient level of private investment in R&D.

Part of creating those incentives means having a tax system that is less distortionary with more equal rates on different types of activities; we want capital allocated to where it will be most productive, not where it bears the lowest tax burden.

But when business activity generates spillovers that impact other firms and the general public, tax policy should help to align the social and private incentives for these activities. Tax

policy can help remedy distortions fundamental to private markets by appropriately subsidizing or penalizing activities with clearly established positive or negative spillovers.

The question then is how can tax policy best support innovation? One of the tools we have is the R&E credit, which subsidizes expenditures on research inputs. Another tool is an innovation box, which applies a separate, lower, tax rate to income attributed to patents and other types of intangible business property, such as copyrights, trademarks, trade secrets, and other forms of IP. Although both methods make innovation more attractive to private enterprise, they have different implications given the inherent uncertainty of innovation. Moreover, they have different implications in terms of tax administration.

Subsidizing inputs means expending fiscal resources on activities regardless of whether or not they pay off in terms of profits or social applications. On the other hand, an innovation box means rewarding factors like luck and market power along with higher research expenditures.

Historically, the United States has favored the former approach and has used both Section 174 expensing of research expenditures and the R&E credit to create an incentive for research activities by subsidizing research investments. Every one of the President's Budgets proposed to make the R&E credit permanent and we were pleased that Congress finally took this step last December, while also making the credit more valuable for small businesses by allowing them to use it to offset payroll taxes. However, Congress should have offset the cost of these provisions.

A number of countries including the UK, France and the Netherlands have recently adopted innovation boxes with different variations in their tax rates, the types of eligible IP, the scope of qualifying income, and the treatment of IP-related expenses.

The U.S. approach is supported by a wide range of research conducted in several countries over many years. For example, research by Bronwyn Hall, Jim Hines as well as Nick Bloom, Rachel Griffiths and John Van Reenan has found that research credits are highly effective in increasing research spending—each dollar of forgone tax revenue due to the credit generally leads firms to invest at least one dollar in research and development with some studies finding much larger effects. These studies among others find elasticities of roughly one and often as high as two. In contrast, innovation boxes are a much newer development and have not been as widely studied.

Let me explain six interrelated reasons based on economic and tax administration reasoning why the Administration believes expanding the R&E credit is a cost effective way to promote innovation while adopting an innovation box would move tax policy in the wrong direction, increasing complexity and cost without a commensurate boost to innovation:

First, the R&E credit better addresses the underlying positive externality: socially valuable research that would not occur without government support. By subsidizing research investment directly, the R&E credit likely has a greater impact in boosting research. This aspect of the R&E credit is especially important given the long-term decline in Federally-funded R&D,

which tends to support investments in innovations that have large social benefits but may be difficult to directly commercialize.

In contrast, an innovation box primarily creates an incentive for engaging in research that is highly profitable for the firm because the tax benefits are proportional to the income generated by the innovation. The social benefit from investment in research may not, however, be proportional to its anticipated commercial potential. Within the set of innovative activities, we expect that those activities that lend themselves most easily to commercialization are not the activities in which private businesses most underinvest; nonetheless, it is precisely these activities—those that most easily generate profits—that are primarily subsidized by innovation boxes.

Second, the R&E credit is proportional the amount of research while an innovation box is proportional to the return. While in theory there are some advantages to focusing on the return and not just rewarding any research that is undertaken, in practice in addition to the externalities just discussed there is also the issue that much of the reward to innovation is the result of luck, market power, or other supernormal returns—the subsidization of which creates windfall gains without increasing incentives to undertake the activity.

Third, the R&E credit focuses its entire subsidy on new research, while shifting to an innovation box would, depending on how it is structured, confer a windfall subsidy on research that has already been undertaken and intellectual property that already exists—a gain for businesses without a commensurate offsetting tax policy benefit.

Fourth, the R&E credit can improve cash flow while an innovation box does not. A small business, for example, may not be able to access capital markets to finance an investment in research today. The R&E credit, however, reduces the firm's tax liability *today*, which may free up capital that enables the firm to make the research investment. In contrast, an innovation box that increases the potential *future* benefit from research investments will not help this firm find the financing to make the investment.

Fifth, the cost of expanding the R&E credit is proportional to the amount of research that is actually undertaken. The President's proposed expansion is estimated to cost an additional \$27 billion over ten years, a cost that would be fully paid for in the context of business tax reform. In contrast, the cost of an innovation box is highly uncertain, potentially large, and depends not just on the amount of innovation that takes place but also the amount of luck, market power, and especially the degree to which it facilitates tax planning by multinationals.

In the United Kingdom, the introduction of a low-tax patent box reduced corporate tax revenues, even when companies reported more innovation-related income (Griffith et al. 2014). In the United States, the revenue costs of a similar tax incentive are likely to be especially large because of the disproportionately large share of innovation-related income U.S. multinationals earn from currently-taxed foreign royalty payments and the much larger domestic market—and I doubt that even dynamic scoring would substantially change that conclusion.

Finally, while the R&E credit entails some complexity and administration challenges (largely around defining eligible expenditures), its structure more closely addresses the

externality it seeks to address—and the Administration’s proposed simplification and expansion of the credit would reduce complexity. In contrast, establishing an innovation box would create substantially more complexity. It would require new tax rules and compliance checks that would be needed to determine precisely how much income was associated with particular innovations—raising many of the same issues that entangle taxpayers and tax authorities in the transfer pricing context. For instance, it could be difficult to determine how much of a technology company’s income is due to investment in developing a new microchip versus investment in computer design or in advertising and marketing activities. Corporations would have strong incentives to attribute as much income as possible to the tax-favored innovation to take advantage of preferential tax rates. These difficulties would lead to disputes between the Internal Revenue Service and taxpayers, resulting in increased resources devoted to tax planning and justification instead of increased innovative activity. The income eligible for the innovation box rate can be defined very broadly in an attempt to alleviate this concern, but only at the cost of further watering down the incentive for the activities with substantial spillover benefits.

Moving to an innovation box would entail joining in a race to the bottom that is not justified by the economics of an innovation box and certainly not justified when an alternative, proven, effective method exists to encourage greater investment in innovation. The threat that in the absence of change R&D will move overseas is overstated given the relatively strong non-tax considerations that go into the location of actual R&D activities, not to mention the fact that the associated deductions for the activity would become less valuable. Moreover, to the degree there are legitimate issues, these are best addressed with a broader tax reform that establishes a uniform lower rate, not a patchwork of rates that would be difficult to define and difficult to patrol.

## **Conclusion**

Innovation and investment in R&D are both critical to continued growth in productivity, which is itself crucial to gains in income and increasing standards of living for all Americans. Well-designed government policies that foster innovation can both promote the well-being of consumers and workers and ensure that American businesses thrive—a “win-win” from the standpoint of society as a whole. Of course our broader economic policy framework must also ensure that the gains from innovation are broadly shared by promoting competition and access. It is therefore critical that policy makers continue to advance policies that do not stifle innovation, but instead encourage productivity gains in a way that does not compound longstanding issues such as inequality and that is consistent with our basic values as Americans.

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