ECONOMIC ANALYSIS

Will International Tax Reform Slow U.S. Technology Development?

By Martin A. Sullivan — martysullivan@comcast.net

Everybody knows that in the 21st century, profit shifting and intangibles go together like bagels and cream cheese. But few have ventured to ask the question that looms like a dark cloud over federal tax reform and the OECD’s base erosion and profit-shifting effort: If governments succeed in their quest to stop the shift of intangible profits to tax havens, will they stifle the creation of knowledge-based capital in their domestic economies?

Private-sector expenditure on research and development is qualitatively different from most other business spending because the benefits it provides go beyond the profits it generates. Knowledge created by research and development spills over to other firms and industries. Because of these positive externalities, a firm left to its own devices underinvests in research. This is a case in which the free market does not work. So, unlike most other tax expenditures, tax subsidies for research have solid economic justification.

Front-Loaded Incentives

Governments have a lot of tools in their tax toolbox that they can use to promote technological innovation. A simple but useful way to classify these incentives is to divide them into two categories: front-loaded and backloaded. Front-loaded tax incentives provide tax benefits that are based on the costs of investment. Backloaded tax incentives provide tax benefits for the profits of those investments.

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Tax credits for qualified research spending are one type of front-loaded incentive. The United States has a nonrefundable, temporary credit that applies to expenditures above a base amount that, depending on which option a taxpayer chooses, equals some average of prior years’ qualified expenditures. Most of official Washington, including President Obama, wants to expand the research credit and make it permanent.

Another type of front-loaded tax incentive is the first-year write-off of all the costs of research. Expensing of investment in research has become such common practice for tax and financial accounting purposes that it is easy to forget that successful investments in research should be capitalized. The Treasury Department and the Joint Committee on Taxation include expensing of research expenditures in their tax expenditure budgets. They estimate the five-year cost of this tax benefit at more than $30 billion.

A third type of front-loaded tax benefit is what is sometimes called a superdeduction. In lieu of a tax credit, governments will allow deductions for research in excess of the costs of research. For example, the United Kingdom allows a deduction for 225 percent of research costs incurred by small and medium-size firms and a deduction of 130 percent of research expenses of large firms.

Dutch Sandwich or a Carrot?

Backloaded incentives are tax provisions that reduce taxes imposed on profits as those profits are generated. Mechanically, this may happen by providing a special low rate for qualified income or by allowing a deduction or exemption equal to a percentage of qualified income.

Currently, the backloaded incentives that are getting all the attention are patent boxes. Also known as innovation boxes, these provisions provide low rates of tax on income generated by designated categories of intangible assets. Following the lead of several other European countries, the United Kingdom has a patent box that came into effect on April 1. It provides a deduction equal to the proportion of a firm’s total taxable income that is generated by licensing or selling patents or by selling a product incorporating a patented invention (even if that invention is only a small part of the value added of the product). In 2017, when it is fully phased in, the deduction will provide a benefit equal to a 10 percent statutory rate on qualified patent income.

In October 2011 House Ways and Means Committee Chair Dave Camp, R-Mich., released an international tax reform discussion draft that would move the United States to a territorial system. Option C of the draft’s anti-base-erosion rules includes 60 percent of otherwise exempt foreign intangible income in U.S. taxable income if that income was subject to a foreign effective tax rate of less than 13.5 percent. Given the 25 percent statutory rate adopted in the draft, this income would effectively be subject to 15 percent tax. In addition to this “stick,” option C includes the “carrot” of a 15 percent rate for domestic intangible income. The carrot component of option C is a patent box without any restrictions on the type of intangibles whose income qualifies for the special low rate.
The Accidental Incentive

Despite commonly being portrayed as lagging behind most other major countries in tax incentives for research, the United States currently makes available a large backloaded tax benefit. International tax planning has allowed multinational corporations to transfer the rights to patents and other valuable intangible assets to tax havens so that profits generated by these intangible assets pay next to nothing in tax. Although self-created rather than legislated, this low rate of income from expatriated intangibles creates backloaded tax benefits similar to a patent box.

It is not clear why this phenomenon is so often omitted from analyses of tax policy for innovation. Perhaps it is the complexity. Perhaps it is its relatively recent rise to prominence. Or perhaps it is overlooked because it is an accidental incentive that Congress never intended. Whatever the reason, there is no ignoring the fact that for many U.S. multinationals, the low tax rate on intangible income made possible by their tax planning provides a potent tax incentive for conducting domestic research.

Economic Perspective

How do economists view tax incentives for research? As usual, they like to boil down the key concepts into algebraic expressions and then plug in values for variables that they think are good approximations of reality. Table 1 on p. 462 uses two metrics, average effective tax rates and tax credit equivalents, to quantify the incentive effects of tax credits and expensing and of backloaded incentives like patent boxes and international tax planning.

The first column of Part A of Table 1 sets the stage by using average effective tax rates to illustrate some of the most basic principles of tax economics. (Details of calculations are provided at the end of this article.) If a capital project earns a rate of return equal to an investor’s minimum hurdle rate (in this case, 10 percent) and if deductions for tax depreciation are in line with economic depreciation, then the effective tax rate equals the statutory tax rate of 35 percent. If capital expenditures are expensed, the effective tax rate equals zero.

Tax credits provide significant investment incentives, especially for investments in short-lived capital. Even without the advantage of expensing, a 5 percent tax credit reduces the effective rate from 35 to 16.3 percent. With expensing, a 5 percent tax credit reduces the effective tax rate to 5.8 percent. A negative effective tax rate means that the investment in question is not only free of tax, but that it is generating tax benefits that can be used to shelter other income as well.

Tax credit equivalents look at tax benefits from a different vantage point than effective tax rates. By the wonders of algebraic manipulation, any tax benefit — including accelerated depreciation or targeted tax rates — can be restated as a tax credit equivalent. So, for example, as shown in the first column of the first panel of Table 1, expensing is equivalent to a 6 percent tax credit with economic depreciation.

By moving across the columns from left to right — from lower to higher rates of return on investment — we can see the importance of tax credits shrink as rates of return rise. As already noted, a 5 percent tax credit with economic depreciation yields an effective tax rate of 5.8 percent when the rate of return on investment equals the hurdle rate. But as the rate of return on investment increases, the amount of tax credits relative to the amount of income subject to tax declines. So if the rate of return is 30 percent, a 5 percent credit only reduces the rate of tax from 35 percent to 23.3 percent. If all those numbers numb your brain, just remember that when rates of return are high (for example, a $10 million return on a $1 million investment), the investing firm will care a lot about the tax rate on the $10 million and little about credits and deductions related to its $1 million expenditure.

Better Than a Tax Credit

By comparing the results of Part A, which assumes a 35 percent statutory rate, with Part B, which assumes a 5 percent statutory rate, we can assess the impact of intended backloaded incentives like patent boxes, including Camp’s option C, as well as unintended backloaded incentives, like the low tax rates made possible by international tax planning.

Not surprisingly, a lower statutory rate reduces average effective tax rates and raises tax credit equivalents. For example, an expensed investment in research that generates a 30 percent rate of return has, as already noted, an effective tax rate of 23.3 percent when subject to a 35 percent statutory tax rate. With a 5 percent statutory rate, the effective rate drops to 3.3 percent. The statutory rate reduction increases the effective rate equivalent from 6 percent to 16.3 percent. In other words, under these circumstances, a special 5 percent rate on intangible income — whether because of a patent box or the availability of international tax planning — is the equivalent of a 10.3 percent tax credit.

These are only illustrative calculations. However, the assumed values are reasonable approximations of common real-world scenarios. In today’s environment, a 5 percent tax rate on income from patents shifted out of the United States is a matter of course. And how realistic is a 5 percent research tax credit? In 2007 total research credits claimed on tax returns were approximately $8.3 billion, while total business-funded research spending was $243
billion, suggesting an average effective rate of credit of 3.4 percent (Laura Tyson and Greg Linden, “The Corporate R&D Tax Credit and U.S. Innovation and Competitiveness,” Jan. 2012, tables 4 and 6). Given the real-world plausibility of the values chosen for Table 1, it is reasonable to conclude that tax benefits made possible by international tax planning provide incentives for research that are comparable to, and often greater than, those provided by the research credit.

Talking Points
So the U.S. tax treatment of research may be significantly more competitive than most people think. In one respect, this is not welcome news for multinationals because their lobbyists have become fond of telling lawmakers that U.S. tax policy for research lags far behind that of other nations (R&D Credit Coalition, “Comments for the Ways and Means Tax Reform Working Group on Manufacturing,” Apr. 15, 2013). The comparative study on which this claim is based only looks at intended incentives like research credits, superdeductions, and patent boxes. It does not take into account unintended tax incentives provided by lax international tax rules (OECD, Science, Technology and Industry Scoreboard, Oct. 2013).

While one valuable talking point is lost, however, another is gained. Table 1 makes clear that tax planning has provided a significant incentive for research, just like the much-vaunted research tax credit. Multinationals can rightly argue that any tax increase on profits from intellectual property (IP) brought about by adding to the code a new minimum tax on foreign profits (as proposed by Obama) or new controlled foreign corporation rules (as proposed by Camp) will significantly diminish incentives to perform domestic research.

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If Congress wants to create high-paying jobs and keep the United States competitive in an increasingly globalized economy, how can it justify adopting a tax reform that undermines tax incentives for knowledge creation and technological innovation?

Bang for the Buck
Two recent studies have explored the effects of backloaded tax incentives for research. In general, the studies give these incentives low marks. Michael J. Graetz and Rachael Doud conducted an in-depth review of patent boxes and concluded that there is an “absence of convincing evidence of cost-effectiveness” and that patent boxes “affect the location of IP ownership and income, but that the IP may not be accompanied by any significant increase in underlying R&D.” (See “Technological Innovation, International Competition, and the Challenges of International Income Taxation,” Columbia Law Review, 2013, p. 347.) Stephen E. Shay, J. Clifton Fleming Jr., and Robert J. Peroni evaluated Camp’s option C and concluded that the “proposal is flawed from a tax policy, tax administration, and tax base protection perspective.” (See “Territoriality in Search of Principles and Revenue: Camp and Enzi,” Tax Notes, Oct. 14, 2013 p. 173.)

In one of the rare analyses that directly examines the relationship between tax planning and research spending, a just-released study from the OECD uses calculations similar to those in Table 1 of this article and finds that international tax planning has a large positive effect on incentives for research. Nevertheless, the report does not view these incentives favorably: “Scope for international co-operation could be usefully explored to limit unintended tax relief for R&D (and its use in production) from cross-border tax-planning.” (See “Taxation and Knowledge-Based Capital,” Chapter 2 of Supporting Investment in Knowledge Capital, Growth and Innovation, OECD, Oct. 2013.)

Why all the negativity? Here are some of the reasons given in the studies:

- Multinational tax planning does not provide incentives for small and wholly domestic firms to increase their research spending. This inefficiently skews allocation of economic resources to multinationals and gives them a competitive advantage. That is especially problematic given that it is widely believed that small and start-up firms conduct more productive research than large firms, encounter disproportionate difficulties in raising capital, and are often unable to garner the full benefits from existing tax incentives because they do not have sufficient current tax liability.

- Except for patent box proposals that limit benefits to technology-related innovation, backloaded tax benefits, like those provided by international tax planning and Camp’s option C, provide incentives for the development of marketing intangibles as well as new technology. As Shay, Fleming, and Peroni pointed out: “The economic justifications for subsidizing innovative research activity do not extend to marketing intangibles, such as trademarks and brand names or franchises, the value of which results largely from advertising rather than technological innovation.”
Graetz and Doud report that the spillover economic benefits from research that justify tax subsidies accrue primarily to the jurisdiction where research is performed: “Geographic spillovers are significant to firm productivity, but such spillovers decay rapidly with distance.” Because it is often difficult to trace intangible income to the location where the underlying intangible was developed (for example, when a firm acquires patents), governments that make backloaded incentives available may find themselves subsidizing research being conducted outside their countries’ borders. In contrast, front-loaded incentives like the U.S. research credit can enforce, and usually do use, a domestic conduct requirement.

These proposals are extremely difficult for tax authorities to administer, and they often impose large compliance costs on businesses. As difficult as it may be to target subsidy-worthy research expenditures, it is much tougher to isolate the income generated by the capital created by these expenditures.

So in summary, although backloaded incentives undoubtedly provide significant tax subsidies for research, and even though in theory these tax subsidies are economically justified, lax international tax rules appear to be an extremely inefficient way of delivering those subsidies. They are at the same time overgenerous and underinclusive. It is not clear how much damage results from poor targeting of research subsidies, but given the scope of the shortcomings of current law, it would not be a misplaced priority for Congress to search for more cost-effective subsidies for research.

That is not to say that the case for tax-subsidized research is open and shut. Congress could address the market failure of inadequate private investment in research by conducting research at national laboratories or by funding grants to researchers. But even if for some reason direct government spending on research was not feasible, the difficulty of writing into law an enforceable and economically defensible dividing line between activities worthy of subsidy and other business activities — especially in modern corporations, where so much non-laboratory activity is devoted to knowledge creation — calls into question the whole idea of tax

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<th>Average Effective Tax Rates and Tax Credit Equivalents of Various Tax Policies for Research and Various Rates of Return on Research</th>
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Source: Author’s calculations. Notes on calculations are at the end of the article. Shaded cells are discussed in the text.
subsidies for research. As much as innovation may provide unique economic benefits to the economy, attempts to subsidize it pose unique problems of tax administration. Given these inherent difficulties for which no adequate solution may be forthcoming, Congress should not rule out eliminating or scaling back research incentives, especially when it has an attractive and undoubtedly beneficial alternative use of those funds: lowering the statutory corporate rate.

Notes on the Calculations

Average effective tax rates are computed by dividing the present value of tax by the present value of pretax earnings. Tax credit equivalents are the rate of credit that would produce the same effective tax rate for a given set of tax parameters if that credit applied to an investment taxed at 35 percent and allowed deductions for tax purposes equal to economic depreciation.

The discount rate used to calculate present value is 10 percent. Expenditures on research create intellectual property that declines in value to zero in a straight-line pattern over three years.

The two rates of tax — 35 percent and 5 percent — apply to net income. So in Part A, for example, gross income is subject to 35 percent tax, and deductions related to that income are deducted at 35 percent. This would be the case under a cost-sharing arrangement whereby buy-in payments are at market value and ongoing cost-sharing payments include all costs of development. If, however, income is booked at a low rate while deductions are taken at a high rate (for example, under some patent box regimes), the effective tax rates would be much lower. (See the discussion of implications for net versus gross income by Peter Merrill and coauthors in “Is It Time for the United States to Consider the Patent Box?” Tax Notes, Mar. 26, 2012, p. 1665.) For example, the 3.3 percent effective rate shown in Part B (for a statutory tax rate of 5 percent with expensing on an investment with a rate of return of 30 percent) would fall to -55 percent if investment expense was deducted at 35 percent.

TAX HISTORY

How Congress Broke the Gas Tax

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The gas tax is broken, and you can thank members of Congress for that. Lawmakers have refused to raise or modernize the tax for 20 years, hobbling its revenue capacity and leaving the Highway Trust Fund badly underfunded.

That sin of omission, while serious, is only part of the story. Congress broke the tax quite deliberately in the 1990s, when deficit hawks tried to transform it from a user fee to a deficit reduction tool. The experiment was short-lived, and lawmakers eventually repaired the link between gas taxes and road building. But the damage was done, and we’re still paying the price.

Reforming the gas tax won’t be easy, given the political toxicity of raising any tax, and especially one felt so keenly by consumers. But some sort of change is necessary, if only to keep the nation’s bridges from falling down.

Multiple Problems

The federal gasoline tax has been pegged at 18.4 cents per gallon since 1993. Along with other motor fuels taxes, it raises more than $30 billion annually, almost all of which goes to the Highway Trust Fund. But it’s not enough. In the last five years, Congress has been forced to shore up the trust fund with $53 billion drawn from general revenue. Similar infusions will be necessary soon.1

'It has acted as an environmental tax, a general revenue raiser, and a spur of economic growth through a well-developed infrastructure,' wrote Herzig.

The inadequacy of the gas tax stems from two factors. First, and most importantly, construction costs have continued to rise with inflation. Since the tax was last raised, the cost of building roads has