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The 2017 Tax Law (P.L. 115-97) and Investment in Innovation

Technological innovation refers to the often lengthy, uncertain, and convoluted process of bringing new technologies to the marketplace and their adoption by many consumers and companies. Numerous studies have shown that innovation serves as the primary engine of long-term growth in real income per person, mainly by increasing the productivity of a nation's capital stock and labor force. Among the key players in the innovation process are large established companies that invest substantial amounts in research and development (R&D), small start-up (or entrepreneurial) firms seeking to commercialize specific new technologies, and companies that invest in advanced capital assets for use in their operations.

Investment in Innovation and Federal Policy

In a market economy, the main driver of technological innovation is private investment in R&D and in new capital assets that incorporate advanced technologies (e.g., robotics). Companies making such investments seek to seize, sustain, or enlarge a competitive advantage by being the first to sell or use new and improved products, more efficient production methods, and more effective ways of conducting a business.

In theory, companies that engage in R&D are likely to invest too little in that activity, relative to its potential economic benefits. There are two main reasons for this presumed underinvestment. First, R&D (especially basic research) typically generates economic benefits that are not fully captured by the firms financing the R&D investments. Instead, these benefits typically spill over to other firms and consumers. In addition, the difficulties faced by many small entrepreneurial firms in raising funds to undertake R&D can further suppress private R&D investment. Economists consider underinvestment in R&D a market failure. As a result, they recommend that governments try to boost private R&D investment through a variety of policy initiatives, including research grants and tax incentives.

The vast share of domestic business R&D investment goes into development projects. In 2015, according to a survey by the National Center of Science and Engineering Statistics, foreign- and U.S.-based businesses spent $355.8 billion on domestic R&D. Of that amount, $21.8 billion went to basic research (6%), $56.5 billion to applied research (16%), and $277.6 billion to development (78%). Such a distribution is to be expected, since the largest risk of failure and spillover benefits attaches to basic research, while development projects tend to have the lowest risk of both outcomes.

Taxes can affect the domestic climate for innovation in several ways. On the supply side, they help determine the after-tax cost of undertaking an additional unit of R&D through business income tax rates and tax incentives for R&D investment. On the demand side, taxes can alter the incentives for individuals to form their own businesses and the pace at which they grow.

In December 2017, Congress passed a law (P.L. 115-97) that made significant changes in the federal tax code, including substantial cuts in business income tax rates. Many of the changes went into effect on January 1, 2018. One question for lawmakers concerns how these changes are likely to affect the domestic climate for investment in innovation in the short run. Answering the question requires a clear understanding of how previous tax law affected that investment.

Impact of Previous Tax Law

Federal tax law before the enactment of P.L. 115-97 affected the domestic climate for technological innovation in three primary ways. First, it offered incentives to invest in domestic R&D and in new, more advanced machinery and equipment, and software. Second, previous tax law provided an incentive to produce or use domestically new technologies developed anywhere in the world. Third, it influenced the incentives for individuals to form small entrepreneurial companies through income and capital gains taxes.

One measure of the incentive effect of these tax provisions is their impact on the marginal effective tax rates (ETRs) for investment in major asset categories. These rates show the share of pre-tax returns that go to pay income taxes. As such, they take into account current income tax rates, as well as tax provisions that help shape a company's tax burden, such as deferrals, deductions, exclusions, preferential tax rates, and credits.

Table 1 shows estimates from the Tax Policy Center of the ETRs for major classes of assets (except land) under pre-P.L. 115-97 tax law. The estimates were based on the following assumptions: (1) a corporate tax rate of 35% (now a single rate of 21%) and a passthrough rate of 30% (now a top rate of 29.6%); (2) a required real after-tax rate of return for each asset of 6.5%; (3) an inflation rate of 3%; (4) a nominal interest rate of 6.0%; and (5) a debt financing ratio of 40% for C corporation investments and 30% for non-corporate (or passthrough) business investments.

Table 1. Marginal Effective Tax Rates for Major Asset Categories by Organizational Form (percent)

Asset Type	Corporations	Passthrough Businesses
Equipment	22%	16%
Structures	30	22

Asset Type	Corporations	Passthrough Businesses
Intellectual Property	0	-5
Inventories	40	32
Overall Investment	**26**	**19**

Source: Joseph Rosenberg and Donald Marron, *Tax Policy and Investment by Startups and Innovative* Firms, February 9, 2015, Tax Policy Center.

It is clear from **Table 1** that the federal tax code under prior law was hardly neutral in its impact on business investment. Instead, it subsidized investments in innovation (especially by large, established firms) to a much greater extent than it did investments in other assets. For both corporations and passthrough firms, the returns from R&D investment (which are labeled as "intellectual property" in the table) faced, by far, the lowest tax burden. The returns from investment in equipment had the second lowest burden. Four tax provisions in particular had a substantial impact on the ETRs in **Table 1**: Section 174, Section 41, Section 179, and Section 168(k).

Under previous tax law, Section 174 allowed companies undertaking qualified research to deduct the full amount of qualified R&D expenditures in the year they were paid or incurred. The expensing allowance applied only to wages and material costs paid or incurred in the conduct of research "in the experimental sense."

The Section 41 research tax credit actually consisted of two non-refundable credits for investment in qualified research. Businesses chose which one to use in computing their tax liability. One credit (the regular credit) was equal to 20% of a company's qualified research expenditures (QREs) above a base amount tied to a fixed base period. The other credit (the alternative simplified credit or ASC) was equal to 14% of a company's QREs above a base amount tied to a moving base period. The effective rates of the two credits were below their statutory rates, owing to the rules governing their use. Eligible small firms with insufficient tax liability or a net operating loss (NOL) were allowed to apply up to $250,000 of any unused credit in a tax year to their share of the Social Security tax for employees.

Sections 179 and 168(k) allowed companies to accelerate the recovery of the cost of qualified assets (largely machinery, equipment, and off-the-shelf software) they placed in service in a tax year. The Section 179 expensing allowance was set at $500,000 in 2017, and it began to phaseout when a firm's total cost for those assets exceeded $1 million; both amounts were indexed for inflation. Under Section 168(k), companies of all sizes could write off 50% of the cost of eligible assets they placed in service in 2017.

Two other tax provisions also had a notable effect on the domestic climate for innovation under previous tax law: Section 199 and Section 1202.

Section 199 gave companies an incentive to produce or use in the United States innovative new products and production processes. Under Section 199, a firm could deduct 9% of its income from qualified domestic production activities; the deduction was capped at 50% of wages from those activities. The deduction lowered a firm's ETR for the returns on investment in eligible activities.

Section 1202 encouraged equity investment in small corporations in a range of industries by allowing investors to earn tax-free gains on the sale of qualified small business stock they held for at least five years.

P.L. 115-97 and Investment in Innovation

The following provisions in the new tax law could affect the domestic climate for investment in innovation in the short run:

- Permanent reduction in the top corporate income tax rate to 21% and the top income tax rate for passthrough business income to 29.6%,
- Increase in the expensing allowance under section 168(k) from 50% to 100% for eligible assets placed in service between September 18, 2017 and December 31, 2022,
- Permanent increase in the Section 179 expensing allowance to $1 million and the phaseout threshold to $2.5 million; both amounts are indexed for inflation,
- Repeal of the Section 199 deduction for domestic production income, and
- Repeal of the option to expense research expenditures under Section 174 and a requirement that those expenditures be capitalized and amortized over five years, starting in 2022.

The net effect of these provisions on domestic investment in innovation is difficult to assess. Nonetheless, several observations seem warranted. First, the cuts in the top corporate and passthrough business income tax rates will lower the cost of capital for investment in all kinds of assets, including R&D. But the inability to expense R&D expenditures beginning in 2022 will offset some of that reduction in the cost of capital for R&D investments. Second, full expensing of qualified assets through 2022 could increase the rate at which businesses invest in productivity-enhancing technologies such as robotics. Third, the differences between business and individual income tax rates, especially as they relate to business profits and losses, may affect the willingness of individuals to start new entrepreneurial businesses. Fourth, none of the changes are likely to make it easier for start-up firms to raise capital for investment.

Gary Guenther, Analyst in Public Finance

IF10757

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