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The Research and Development Tax Credit: Moderately Effective But Hampered By Politics

Jonathan Talley*

Since the research tax credit entered the code in the Economic Recovery Tax Act of 1981 as a temporary provision, legislators and scholars have debated the benefits and burdens of making the credit permanent. In this Article, I examine the effects of a permanent research tax credit for businesses. After examining the history and design of the research tax credit and analyzing research expenditures of businesses in relation to the research credit provision, I argue that a reliable, predictable, and permanent research tax credit would maximize the benefits of the credit while minimizing the burdens.

I. Introduction

Technological innovation is a major driving force in long-term economic growth, meaning research and development (R & D) serves as the fuel of innovation. Realizing this, Congress passed the research and development tax credit in 1981 to support R & D efforts. Congress aimed to boost private sector research and development investment by reducing the after-tax cost to firms performing qualified research beyond a certain amount. The research tax credit has never been a permanent part of the tax code and Congress renewed it on December 17, 2010 for two more years, 2010 and 2011. The research tax credit consists of five different types of credits.
This paper opens by providing a legislative history of the research and development tax credit from its inception to the present. It then examines economic studies and analyzes the effectiveness of the tax credit. Lastly, the paper concludes with ways to amend the tax credit that would increase its effectiveness.

II. LEGISLATIVE HISTORY OF THE RESEARCH TAX CREDIT

The Economic Recovery Tax Act of 1981 created the first federal R & D tax credit as a temporary provision, effective through 1985. The Ninety-Seventh Congress created the tax credit in an attempt to stimulate R & D spending, which had been declining throughout the previous decade in the private sector. Congress concluded a "substantial tax credit for incremental research and experimental expenditures was needed to overcome the reluctance of many ongoing companies to bear the significant costs" incurred in research programs within businesses.

The initial provision credited twenty-five percent of qualified research spending above a business's base amount. The base amount equaled the entity's average annual research spending of its three previous tax years. Taxpayers that claimed the credit but were unable to apply the entire amount against its current federal income tax liability were allowed to carry unused credits back three years or forward fifteen years.

On October 22, 1986, Congress revised and extended the research credit by passing the Tax Reform Act of 1986, which extended the credit through 1988. Congress significantly altered the credit by limiting the general business credit to a yearly cap, as well as reducing the credit rate from twenty-five percent of qualified research spending to twenty percent of qualified research spending.

Before the credit expired in 1988, Congress extended it through 1989. Once again in 1989, Congress extended the research credit an additional year through 1990 by passing the Omnibus Budget Recon-
ciliation Act of 1989.\textsuperscript{16} Congress continued the trend of extending the credit one year at a time in 1990 extending the credit through 1991, and later in 1991, Congress extended the credit through July 1, 1992.\textsuperscript{17}

In 1992, Congress passed two bills that would have extended the research credit, but President George H. W. Bush vetoed both for reasons not concerning the research credit's design or effectiveness.\textsuperscript{18} Congress remedied the research tax credit expiration by enacting the Omnibus Budget Reconciliation Act of 1993.\textsuperscript{19} The Act extended the credits retroactively from July 1, 1992, through June 30, 1995.\textsuperscript{20}

The research credit expired again on June 30, 1995; however, this time it was due to Congress' inability to pass any bill.\textsuperscript{21} In August 1996, Congress again passed a bill retroactively reinstating the credits from July 1, 1996 to May 31, 1997.\textsuperscript{22} This left a one-year void in the credit's coverage for the first time since Congress enacted the credit in 1981.\textsuperscript{23} In 1997, Congress continued the trend of letting the credits expire only to pass a bill retroactively extending the credits.\textsuperscript{24} This time, the Taxpayer Relief Act of 1997 extended the credits from June 1, 1997, to June 30, 1998.\textsuperscript{25}

In 1999, the credits expired once again. Yet again, Congress reinstated the credits with retroactive legislation through the Ticket to Work and Work Incentives Improvement Act of 1999, extending the research credits from July 1, 1999, to June 30, 2004.\textsuperscript{26}

Congressional and presidential efforts to permanently extend the research credits explain the mid-1990s trend of expiring research tax credits. Members of Congress and the business community denounced repeated temporary extensions of the tax credit as wastes of legislative time.\textsuperscript{27} In light of presidential remarks in support of a permanent extension, congressional leaders in both houses began to negotiate tax legislation including a permanent extension of the research

\textsuperscript{18} GUENTHER, supra note 1, at 12–13.
\textsuperscript{20} Id.
\textsuperscript{21} GUENTHER, supra note 1, at 13.
\textsuperscript{23} GUENTHER, supra note 1, at 13.
\textsuperscript{24} Id.
\textsuperscript{27} GUENTHER, supra note 1, at 14.
credit.\textsuperscript{28} Yet no Congress and President have been able to agree on a permanent extension due to the difficulty of reconciling the revenue cost of a permanent extension with other budget priorities.\textsuperscript{29}

In 2004, the Working Families Tax Relief Act extended the research tax credit through 2005.\textsuperscript{30} The Energy Policy Act of 2005 revised the research credit by adding another credit option for payments concerning energy research performed under contract by qualified entities.\textsuperscript{31} However, this Act did not extend the research credit.\textsuperscript{32} In 2006, Congress retroactively extended the tax credit through 2007 by passing the Tax Relief and Health Care Act.\textsuperscript{33} More retroactive legislation followed in 2008 with the Emergency Economic Stabilization Act, which effectively extended the credit through 2009.\textsuperscript{34} Finally, on December 17, 2010, the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act retroactively extended the research tax credit for the fourteenth time through 2011.\textsuperscript{35}

III. HOW THE RESEARCH AND DEVELOPMENT TAX CREDIT WORKS TODAY

The research tax credit allows businesses to receive up to three credits: (1) a credit equal to twenty percent of qualified research expenditures exceeding the base amount;\textsuperscript{36} (2) a twenty percent credit of basic research expenses for the taxable year; and (3) a twenty percent credit of energy research spending.\textsuperscript{37} The research tax credit has five separate components: (1) a regular research credit; (2) an alternative research credit (AIRC); (3) an alternative simplified incremental credit (ASIC); (4) a basic research credit; and (5) an energy research credit.\textsuperscript{38} All the credits are non-refundable, meaning the credits cannot reduce one's tax liability to less than zero.\textsuperscript{39} Business taxpayers can claim the basic research credit and energy research credit in addi-
tion to choosing one of the following three credits: AIRC, ASIC, or the regular research credit.40

Claims for credits depend on the definition of “qualified research expenditures.”41 There are two important parts to the definition. The first part of the definition describes the nature of the qualified research itself.42 Research must satisfy four criteria in order to be considered “qualified research” under AIRC, ASIC, and the regular research credit.43 First, the research must comport with section 174, which states that the research must be experimental in nature.44 To be experimental in nature, the activities should be aimed at the development of a new or improved product or process.45 Second, the research must be undertaken for the purpose of discovering information, which is technological in nature.46 Third, the research expenditures should seek to gain new technical knowledge that is useful in the development of a new or improved “business component.”47 A “business component” is a product, process, computer software technique, formula, or invention to be sold, leased, licensed, or used by the firm performing the research.48 Fourth and finally, the research must entail a process of experimentation aimed at developing a product or process with a “(i) new or improved function, (ii) performance, or (iii) reliability or quality.”49 Research satisfies the four requirements if it aims to develop a new or improved function for a business component, or to improve the performance, reliability, or quality of a business component.50 On the other hand, research fails to satisfy the “qualified research” test if its main purpose is to modify a business component according to “style, taste, cosmetic, or seasonal design factors.”51

The second important part of the definition of “qualified research” concerns expenses eligible for the credit.52 “Qualified expenses” arise from in-house research as well as contract research.53 When dealing

40. Id.
41. § 41(d).
42. Id.
43. Id.
44. § 41(d)(1)(A); see § 174.
45. Id. § 41(d)(1)(A).
46. § 41(d)(1)(B)(i).
47. § 41(d)(1)(B)(ii).
50. § 41(d)(3).
51. § 41(d)(3)(B).
52. § 41(b)(1).
53. Id.
with in-house research, the regular, AIRC, and ASIC credits include wages and salaries of employees and supervisors engaged in the research in addition to costs of materials, supplies, and leased computer time.\textsuperscript{54} In contract research, the credits apply to the full amount paid for qualified research conducted by certain firms, colleges and universities, and federal laboratories.\textsuperscript{55} However, only seventy-five percent of payments for research performed by other research consortia are credited, and only sixty-five percent of payments for research performed by other non-profit entities dedicated to scientific research are credited.\textsuperscript{56}

Research expenditures on depreciable assets used in qualified research, such as buildings and equipment, do not qualify for the research tax credit.\textsuperscript{57} Neither do overhead expenses for the research including things such as heating, electricity, rents, leasing fees, insurance, property taxes, and fringe benefits of research employees.\textsuperscript{58} These expenses can account for twenty-seven to fifty percent of business research spending, but it is unsubsidized by the government.\textsuperscript{59}

A. Regular Research Credit

Congress has extended the regular research credit thirteen times with five modifications since its inception in 1981.\textsuperscript{60} Businesses can receive a credit equal to twenty percent of its qualified research expenses beyond a base amount.\textsuperscript{61} This structure is intended to encourage firms to spend more on research than they would in the absence of the credit by crediting expenditures that exceed the average amount a firm would spend if no credit existed.\textsuperscript{62} The base amount serves to approximate the amount a firm would spend on research if the credit did not exist.\textsuperscript{63} To calculate the base amount, one must follow two rules.\textsuperscript{64} First, the fifty percent rule states the base amount must be equal to or greater than fifty percent of a firm’s research expenditures in the given tax year.\textsuperscript{65} Second, one must deter-

\textsuperscript{54} § 41(b)(2)(A)(i)-(iii).
\textsuperscript{55} § 41(b)(3)(D).
\textsuperscript{56} § 41(b)(3)(A), (C).
\textsuperscript{57} GUENTHER, supra note 1, at 5.
\textsuperscript{58} Id.
\textsuperscript{59} Id.
\textsuperscript{60} Id.
\textsuperscript{61} § 41(a)(1).
\textsuperscript{62} GUENTHER, supra note 1, at 5.
\textsuperscript{63} Id.
\textsuperscript{64} Id.
\textsuperscript{65} § 41(c).
mine if the firm is an established firm or a start-up.\textsuperscript{66} Established firms have gross receipts and research expenditures in at least three years from 1984 to 1988.\textsuperscript{67} Firms that do not qualify as established firms qualify as start-ups.\textsuperscript{68} The base amount is the product of a fixed-base percentage and average annual gross receipts in the previous four tax years but the fixed-base percentage is different for start-up firms compared to established firms.\textsuperscript{69} The fixed-base percentage of an established firm is the ratio of its total research expenditures to total gross receipts between 1984 and 1988, capped at sixteen percent.\textsuperscript{70} The fixed-base percentage of a start-up firm is set at three percent during the firm’s first five tax years, and gradually, the percentage adjusts to reflect the firm’s actual expenditures, so by the eleventh tax year, the percentage equals the firm’s total research expenditures compared to its total receipts in the fifth through tenth tax years.\textsuperscript{71} In general, firms with lower fixed-base percentages have a better chance at claiming the regular credit.\textsuperscript{72}

To calculate a firm’s regular research expenditures tax credit, firms must first find the fixed-base percentage by doing the following: (1) total the research expenses from 1984 to 1988 to get X; (2) total the gross receipts from 1984 to 1988 to get Y; and (3) divide the research expenses, X, by the gross receipts, Y, to determine the fixed-base percentage, Z.\textsuperscript{73} The next step is calculating the base amount for the current tax year.\textsuperscript{74} There are two steps to calculate the base amount: (1) average the annual gross receipts for the previous four tax years to get A; and (2) multiply this average, A, by the fixed-base percentage, Z, and the result is the base amount, B.\textsuperscript{75} Now the preparatory work is done, and the firm is ready to calculate its regular tax credit. It must start by taking the qualified research expenditures for the current tax year, E, and either subtract the base amount, B, or fifty percent of the expenditures, \((.5)E\), whichever is greater, to get the reduced research expenditures, F.\textsuperscript{76} For the final step multiply the reduced expendi-

\textsuperscript{66} Id.
\textsuperscript{67} § 41(c)(3)(B).
\textsuperscript{68} Id.
\textsuperscript{69} § 41(c)(3)(B)(2).
\textsuperscript{70} § 41(c)(3)(C).
\textsuperscript{71} § 41(c)(3)(B)(2)(ii)(I)-(VII).
\textsuperscript{72} GUENTHER, supra note 1, at 6.
\textsuperscript{73} See id.
\textsuperscript{74} See id.
\textsuperscript{75} See id.
\textsuperscript{76} See id. at 7.
tures, F, by the twenty percent the IRS allows, and this, (.2)F, gives the firm its regular research credit.77

B. Alternative Incremental Research Credit (AIRC)

Firms unable to claim the regular credit have the option to claim the alternative incremental research credit.78 But claiming the AIRC has future consequences because when a firm elects to claim the AIRC in a particular tax year, it must continue to claim the AIRC in future tax years unless the firm receives permission from the IRS to switch to another credit.79 This may deter firms from claiming this credit even though they may be better off with it.80 Qualified research expenditures under the AIRC are subject to the same rules as the regular research credit.81 The AIRC is equal to three percent of a firm's research expenditures above one percent but less than 1.5% of its average annual gross receipts in the previous four tax years, plus four percent of its research expenditures above 1.5% but less than two percent of its average annual gross receipts in the previous four tax years, plus five percent of its research expenditures greater than two percent of its average annual gross receipts in the previous four tax years.82 Firms should elect to use the AIRC if their research expenditures in the current tax year exceed one percent of their average annual gross receipts in the past four years.83 The AIRC also benefits business taxpayers who have declining research expenditures, or increasing sales that outpace research expenditures, which lead to a high fixed-base percentage.84

To calculate the AIRC, firms must begin by calculating the average annual gross receipts for the previous four years, A.85 Then multiply this amount, A, by 1%, 1.5%, and 2% to set up the levels that different tax credit rates apply.86 Subtract the first level, (.01)A, from the qualified research expenses of the tax year, E.87 Repeat this step for 1.5% and 2% by subtracting (.015)A from E and (.02)A from E.88 This sets up three levels with different credit rates, hence the incre-

77. See GUENTHER, supra note 1, at 7.
79. § 41(c)(4)(B).
80. GUENTHER, supra note 1, at 7.
81. § 41(b).
82. § 41(c)(4)(A)(i)–(iii).
83. GUENTHER, supra note 1, at 7.
84. Id.
85. Id. at 8.
86. See id.
87. See id.
88. See GUENTHER, supra note 1, at 8.
mental credit: (1) a level between 1% and 1.5% of expenditures, L1; (2) a level between 1.5% and 2% of expenditures, L2; and (3) a level between two percent and one hundred percent of expenditures, L3.\textsuperscript{89} Expenditures between 1% and 1.5% are credited at 3%, so multiply L1 by .03 to get the first part of the credit, C1.\textsuperscript{90} Expenditures between 1.5% and 2% are credited at 4%, so multiply L2 by .04 to get the second part of the credit, C2.\textsuperscript{91} Expenditures between 2% and 100% are credited at 3.75%, so multiply L3 by .0375 to get the third credit, C3.\textsuperscript{92} Add the three credits together and that is what the business can receive as its alternative incremental research tax credit.\textsuperscript{93}

C. Alternative Simplified Incremental Credit (ASIC)

The ASIC allows a business taxpayer to claim this credit instead of the regular credit or AIRC.\textsuperscript{94} The ASIC is equal to fourteen percent of a firm’s research expenditures in the current tax year exceeding fifty percent of its average research expenditures in the previous three tax years.\textsuperscript{95} If a firm has no research expenditures in any of the previous three years, then the credit is equal to six percent of its research expenditures in the current year.\textsuperscript{96} Similar to the AIRC, an election to claim the ASIC binds a firm to take the ASIC in future tax years unless the IRS consents to the firm claiming a different research credit.\textsuperscript{97}

A firm calculates its ASIC by finding its average research expenditures in the previous three years, A.\textsuperscript{98} The firm then subtracts fifty percent of this average, (.5)A, from its current research expenditures in the taxable year, E, giving the firm its reduced expenditures, F.\textsuperscript{99} Finally, the firm multiplies the credit rate of fourteen percent by its reduced expenditures, (.14)F, to get its tax credit, C.\textsuperscript{100}

\textsuperscript{89} See id.
\textsuperscript{90} See id. at 9.
\textsuperscript{91} See id.
\textsuperscript{92} See id.
\textsuperscript{93} See GUENTHER, supra note 1, at 9.
\textsuperscript{94} I.R.C § 41(a) (2006).
\textsuperscript{95} § 41(c)(5)(A).
\textsuperscript{96} § 41(c)(5)(B)(ii).
\textsuperscript{97} § 41(c)(5)(C).
\textsuperscript{98} See GUENTHER, supra note 1, at 9.
\textsuperscript{99} See id.
\textsuperscript{100} See id.
D. Basic Research Credit

The goal of the basic research credit is to promote collaborative research between firms, colleges, and universities. The credit is equal to twenty percent of total payments for research above a "qualified organization base period amount," which is different from the "base amount" referred to in the code. The base period amount is like the base amount in that it intends to approximate what firms would spend in the absence of the credit, but that is the extent of the similarities between the base amount and the base period amount. Basic research is defined as "any original investigation for the advancement of scientific knowledge not having a specific commercial objective." The basic research credit only applies to research expenditures performed under a written contract by educational institutions, nonprofit scientific research organizations, and certain grant-giving organizations. The credit does not apply to research done outside the United States or in the social sciences, the arts, or the humanities. Firms conducting their own basic research are unable to claim this credit, but they can claim the regular credit, AIRC, or ASIC.

E. Energy Research Credit

Business taxpayers may claim a tax credit equal to twenty percent of payments to certain entities for energy research. To qualify, the payments must be made to an energy research consortium that is a non-profit organization exempt from taxation or is "organized and operated primarily to conduct energy research in the public interest." Also, the energy organization must receive contributions from at least five unrelated persons for energy research where no single person pays more than fifty percent of the total amounts received by the energy organization. The energy research credit is a flat tax credit as opposed to the other four research credits that are incremental, making the energy credit more generous than the others.

101. Id.
102. § 41(a)(ii), (e)(1)(A).
103. Guenther, supra note 1, at 9.
104. § 41(e)(7).
106. § 41(e)(7)(A)(i)-(ii).
107. Guenther, supra note 1, at 10.
108. § 41(a)(3).
111. Guenther, supra note 1, at 10.
IV. The Research Tax Credit's Effectiveness

There are two approaches to evaluate the effectiveness of a tax policy designed to subsidize, and thus correct, the supply of a good. The first approach examines whether the policy stimulates a social return that is at least equal to the social cost. This involves comparing the marginal return of dollars spent to subsidize research to the opportunity cost of using the same dollars in another way, such as educational funding. The social cost of the credit equals the net loss in tax revenue because of the credit and the costs of administering the credit. However, because of the difficulties in measuring the social returns to research and the hypothetical marginal return of opportunity cost, analysts usually use a second method.

The second approach examines the additional research and development stimulated by the credit and compares the value of that research and development with the tax revenue lost because of the credit. This approach assumes the public benefits more from the research returns than the private sector. If the credit stimulates more dollars spent on research than the cost of the tax credit, then proponents can make the case that the tax credit is a cost-effective way to increase research spending. However, if the lost tax dollars exceed the additional research expenditures the credit creates, then direct research subsidies are more cost-effective in boosting research investment.

To determine the amount of research investment the tax credit creates, analysts must find the additional research and development conducted due to the credit. Some studies have reached differing estimates of how much additional research the credit creates, but an overwhelming majority of studies find at least a one to one ratio of additional research to lost tax revenue. A study conducted by

113. Id.
114. Id.
115. Guenther, supra note 1, at 14.
116. Id.
117. Hall, supra note 112, at 8.
118. Guenther, supra note 1, at 14.
119. Id. at 15.
120. Id.
121. Id.
122. Id.; Hall, supra note 112, at 10 (discussing whether the subsidy is more efficiently achieved through a tax credit or government grant).
123. See Aerospace Indus. Ass'n, A Special Report: Research and Development Tax Credit, 4. KPMG found a 1:1 ratio in the short run and a 2:1 ratio in the long run. Bloom,
Professors Bloom, Griffith, and Van Reenen found the credit stimulates $1.10 of research for every dollar of tax revenue lost. Another study conducted over ten years found a greater stimulation of one tax dollar generating approximately two dollars in additional research. Another study, by Professors Klassen, Pittman, and Reed, found that the tax credit induces nearly three dollars of additional research investment for every tax dollar spent. The Bureau of Labor Statistics estimates a one-to-one ratio with every tax dollar spent creating an additional dollar of research.

A KPMG study found the tax credit stimulated similar additional research expenditures as tax revenue lost in the short term. But in the long term, one dollar of lost tax revenue ends up creating two dollars of additional research investment. Thus implying long-run gains in GDP, which is supported by the fact additional research spending means more domestic jobs since the majority of tax credit dollars are directed towards wages. "A 2008 Ernst and Young study estimates 70 percent of the tax credit’s benefits are used to pay salaries." Had the government not extended the credit in 2010, the country could have lost as many as 120,000 jobs domestically. Furthermore, the economy grows with the accumulation of R & D or human capital. One commentator notes, "R&D can increase outputs without decreasing returns through productivity growth because R&D can be shared by multiple actors without additional costs."

Because even conservative estimates show that for every dollar of tax revenue lost at least one dollar of additional research is created, the tax credit is more effective than a government grant, which

Griffith, and Van Reenen found a ratio of 1:1:1. A ten-year study found a ratio of 2:1. A Klassen, Pittman, and Reed study found a 2.96:1 ratio.

124. Id.
125. Id.
126. Id.
127. Id.
128. AEROSPACE INDUS ASS’N, supra note 123, at 4. KPMG found a 1:1 ratio in the short term, but a 2:1 ratio in the long run.
129. Id.
130. Id.
132. Id.
134. Id.
135. See infra notes 163–64 and accompanying text.
would give private firms money to invest on research. Furthermore, in the long run, $1.75 of additional tax revenue would be generated for each dollar the government spends on the credit, creating a net gain for both taxpayers and the government.

While comparing increased research investment to foregone tax revenue is a useful tool, the net benefit the credit provides for society is more important. Economists estimate that half of United States economic productivity after World War Two is attributable to the types of technical progress that results from science and engineering research. Studies show that the median social rate of return on research investment in general exceeds twice the median private rate of return.

The tax credit also has a spillover effect. The spillover effect in research and development is illustrated by one firm’s innovations or improvements helping another firm’s productivity or by one person’s skills and knowledge helping another person in unintended ways. These spillover externalities cause social return to outpace private return: “[R]eturns from R&D are not fully appropriable by the firm, but knowledge leaks out to competitors such that social benefit is higher than private return.” Economist Joel Popkin supported this theory and stated, “[I]t is widely agreed that firms doing R&D do not capture all or even most of their investment through the price mechanism. The existence of the essentially ‘free’ spillovers means the social return from R&D exceeds the private return.”

Without public subsidy, firms may under-invest in research due to the externalities it confers on other firms, including competitors. Under-investment would lead to fewer social benefits and even fewer dollars spent on research investment. The credit leads to more research investment, which in turn leads to more spillover. If the spillover reaches high enough points, firms have increasing incentives to

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136. GUENTHER, supra note 1, at 15; HALL, supra note 112, at 18.
139. Id.
140. Ho, supra note 133, at 29.
142. R & D CREDIT COALITION, supra note 137, at 9.
143. Czarnitzki et al., supra note 141, at 1350.
144. Id.
145. Id. at 1351.
engage in research collaborations, thus enhancing social welfare.\textsuperscript{146} Finally, cooperating in research and development results in higher research investment compared to no collaboration levels of research investment.\textsuperscript{147} From this, one can envision a reinforcing cycle: more research leads to more benefits leading to more research, but on the contrary, less research means fewer benefits leading to even less research.

In 1992, a Griliches study, by reviewing prior analyses, concluded that research and development spillovers exist and generate a higher social rate of return than the private rate.\textsuperscript{148} Additionally, a Jones and Williams study from 1998 concluded that the social rate of return ranged from thirty percent to one hundred percent while the private rate of return averaged seven percent.\textsuperscript{149} Spillover effects even have an indirect impact on firms that do not receive tax credits.\textsuperscript{150} Most knowledge spillovers originate in large firms and universities and spillover to small firms within a geographical proximity of one another.\textsuperscript{151} Spillovers support the legitimization of the tax credit because large firms directly benefit from the tax credit by reducing taxable income, and small firms are indirect beneficiaries through knowledge spillovers.\textsuperscript{152} This allows the program to apply broadly and benefit both large and small firms.\textsuperscript{153}

Because research and development generates positive externalities but is likely to be under-invested in the private sector and generates a higher social rate of return than private return, government intervention to spur private research investment is a logical development.\textsuperscript{154}

One criticism of the research tax credit is that it unnecessarily subsidizes companies for research they would have conducted without a tax credit. Direct government intervention affects private research investment in one of two ways: stimulation or crowding out.\textsuperscript{155} Stimulation occurs when funding generates more private research investment than without the credit.\textsuperscript{156} This establishes a complementary relationship and ultimately leads to productivity growth.\textsuperscript{157} Stimulation could be

\begin{itemize}
\item[146.] Id.
\item[147.] Id.
\item[148.] Ho, supra note 133, at 29.
\item[149.] Id.
\item[150.] Id. at 31.
\item[151.] Id. at 32.
\item[152.] Id.
\item[153.] Ho, supra note 133, at 32.
\item[154.] Id. at 33.
\item[155.] Id. at 69.
\item[156.] Id.
\item[157.] Id.
\end{itemize}
expected if the research tax credits successfully spur specific research investment in areas essential to future productivity growth but that otherwise might be avoided by private firms based on high risk and uncertainty without the credit.\(^{158}\)

Crowding out occurs when the tax credit merely subsidizes private research investment that firms might make at their own expense.\(^{159}\) Thus, there is no additional research investment but only the same continued research. The continued research occurs with a lower cost to the private firm and greater cost to the public.\(^{160}\) A 1996 Industrial Research Institute spending survey found that fifty-five percent of responding companies indicated that the credit was “not at all” influential in establishing the level of their research investment.\(^{161}\) Although anecdotal, this research exemplifies the problem that the credit may not actually be encouraging research investment but only subsidizing it. Recent domestic and foreign studies contrast this evidence and show that a dollar of foregone tax stimulates at least a dollar of research spending.\(^{162}\) In addition, the tax credit system helps to ensure that the net effect is stimulation, not crowding out. Because tax credits are indirect subsidies that reduce research costs based on increasable taxable incomes and research spending, crowding out is generally not expected.\(^{163}\) The crowding out effect is most prevalent as a negative result of direct subsidies.\(^{164}\)

V. Why a Permanent Research and Development Tax Credit is Necessary

Although the tax credit creates significant benefits, a permanent extension of the credit would increase the benefits of the credit. The credit has never been a permanent provision of the tax code, despite numerous congressional attempts to make the credit permanent.\(^{165}\) The most important hindrance to the credit’s effectiveness is its temporary nature.\(^{166}\) Continually renewing one and two-year extensions

\(^{158}\) Ho, supra note 133, at 69.

\(^{159}\) Id.

\(^{160}\) Id. at 69–70.

\(^{161}\) Robert D. Atkinson, Expanding the R&E Tax Credit to Drive Innovation, Competitiveness and Prosperity, 32 J. TECH. TRANSFER 617, 619 (2007).

\(^{162}\) Id.

\(^{163}\) Ho, supra note 133, at 70. Grants and loans are direct subsidies because they are payments in cash or kind. Tax incentives are indirect subsidies because it creates a cost below the market rate, but the firm still bears some of the cost.

\(^{164}\) Id.

\(^{165}\) GUENTHER, supra note 1, at 18.

\(^{166}\) SAYLER, supra note 138.
of the credit is a more costly and much less efficient policy than a permanent credit.\textsuperscript{167}

The lack of permanence weakens the credit’s incentive effect. Many firms plan their research and development projects more than a few years in advance.\textsuperscript{168} Currently, when planning a research project spanning multiple years, business managers cannot count on receiving the credit over the life of the project.\textsuperscript{169} Thus, business managers are unlikely to account for possible credits when setting their annual budget.\textsuperscript{170} This defeats the entire purpose of the tax credit because it means the credit has little to no influence on their decisions.\textsuperscript{171} Whereas with a permanent credit, business managers could plan on the credit due to its certainty, and the credit would have an impact in their final determination.\textsuperscript{172}

Another harm stemming from an uncertain continuing credit is a lapse in coverage. Gaps in coverage, such as the lack of a credit in 1996, greatly burden firms’ planning efforts.\textsuperscript{173} One commentator notes, “Although the program has been around for 30 years and enjoys bi-partisan legislative support, it has yet to be made permanent. The R&D credit has expired numerous times before being retroactively renewed.”\textsuperscript{174} The uncertainty of the credit restricts new projects, limits opportunities, and curtails high value job growth.\textsuperscript{175}

Legislators justified the temporary nature of the credit as a way to review the credit’s performance and effectiveness.\textsuperscript{176} Nevertheless, the credit has been in place for thirty years, which is more than enough time to review the credit’s effectiveness, as demonstrated by the many studies measuring its effectiveness.\textsuperscript{177} Presidents and Congresses of both parties have called for a permanent extension, but have ultimately kept it temporary because it reduces deficit projections.\textsuperscript{178}

\textsuperscript{167} Id.
\textsuperscript{168} Guenther, supra note 1, at 18.
\textsuperscript{169} Id.
\textsuperscript{170} Id.
\textsuperscript{171} Id.
\textsuperscript{172} Id.
\textsuperscript{173} Guenther, supra note 1, at 18.
\textsuperscript{175} Id.
\textsuperscript{176} Sayler, supra note 138.
\textsuperscript{177} Id.
\textsuperscript{178} Guenther, supra note 1, at 18.
Investing in a permanent credit is a good business decision with a high rate of return. A permanent credit coupled with a twenty-five percent increase could boost real GDP by 206.3 billion dollars, generate 270,000 manufacturing jobs, and raise total employment by 510,000 within a decade.\textsuperscript{179} Making the credit permanent would cost an estimated eighty-five billion dollars over ten years.\textsuperscript{180} Not only would a permanent extension provide this return on investment, it would contribute to the global competitiveness of the United States.\textsuperscript{181}

\section*{VI. Hope for the Future?}

Currently, a bipartisan group of congressional leaders is pushing for legislation designed to simplify and strengthen the research and development tax credit. The legislators favor increasing the credit from fourteen percent to twenty percent, along with making the credit permanent for business and investors.\textsuperscript{182} One representative points out, "There are very few easy answers to improving the economic outlook of our nation" \ldots "[b]ut updating the R&D tax credit is one of them."\textsuperscript{183} Another representative stated, "America is the world’s leading innovator—developing life-saving technologies, state-of-the-art computer systems, and breakthrough manufacturing products—but we’re losing ground to competitors around the world."\textsuperscript{184} The United States was an innovator back in 1981 when the government implemented the research tax credit.\textsuperscript{185} The United States was among the first nations to promote research incentives, but by 2002, nations including Spain, Netherlands, Portugal, Canada, Australia, Denmark, and the United Kingdom outspent the United States on research and development incentives relative to gross domestic product.\textsuperscript{186}

\begin{itemize}
\item\textsuperscript{179} Edwards, \textit{supra} note 174.
\item\textsuperscript{181} Edwards, \textit{supra} note 174.
\item\textsuperscript{183} Id. (statement of Rep. Anna Eshoo).
\item\textsuperscript{185} Id.
\end{itemize}
Putting competition aside, it is still beneficial for the United States to follow through with the American Research and Competitiveness Act to avoid the wasted time and inefficiency of re-passing the research tax credit every other year. The current situation bears all the costs of a permanent research tax credit without any of the benefits because the taxpayers are paying for the credit to be continued every year, but corporate leaders never know from one year to the next whether their long-term research efforts will be subsidized by the credit when Congress reexamines it.\textsuperscript{187} As of now, the American Research and Competitiveness Act is growing in popularity and has the support of trade associations and industry groups.\textsuperscript{188} Five organizations endorse the bill including the American Chemistry Council, the National Association of Manufacturers, the Association Connecting Electronics Industries, Business Software Alliance, and Telecommunications Industry Association.\textsuperscript{189} More illustrative, there are no organizations opposing the Act.\textsuperscript{190} Currently, the Bill is assigned to a congressional committee, which will consider the Bill before possibly passing it on to the House or Senate as a whole.\textsuperscript{191} Of individuals visiting the PopVox website, an overwhelming eighty-seven percent support the Bill as of April 7, 2011.\textsuperscript{192} In addition, the Obama-Biden plan to revitalize the economy in this recession includes a platform of making the research and development tax credit permanent.\textsuperscript{193} The plan states,

Barack Obama and Joe Biden want investments in a skilled research and development workforce and technology infrastructure to be supported here in America so that American workers and communities will benefit. Obama and Biden want to make the Research and Development tax credit permanent so that firms can rely on it when making decisions to invest in domestic R&D over multi-year timeframes.\textsuperscript{194}

This push for a permanent research and development tax credit is eerily similar to the failed attempts preceding it. A permanent research tax credit would greatly improve the credit's effectiveness; however, it is only a start.

\textsuperscript{187} Cummings, \textit{supra} note 184.
\textsuperscript{188} Id.
\textsuperscript{190} Id.
\textsuperscript{191} Id.
\textsuperscript{192} Id.
\textsuperscript{193} Obama-Biden Plan, CHANGE.GOV (Apr. 8, 2011), http://change.gov/agenda/economy_agenda/.
\textsuperscript{194} Id.
VII. AN EFFICIENT RESEARCH AND DEVELOPMENT TAX CREDIT

Making the research and development tax credit permanent is the first and foremost fix the credit needs that would improve its effectiveness. Secondly, like many other tax credits, complexity hinders the credit’s effectiveness.

A permanent research tax credit would cost an estimated 8.5 billion dollars a year while promoting at least that much in increased research and development investment. In addition, this would allow companies to finally embark on complex, multi-year research that firms currently shy away from due to the temporary nature of the credit. Expert estimates differ on the exact effect of a permanent credit but range from 162,000 to 510,000 additional jobs, around 7.5 billion dollars of increased research and development spending, and 206 billion dollars more GDP. When Congress extends the research credit every other year, it charges taxpayers the cost of a permanent credit without reaping all the benefits of certainty in the private sector. A permanent research tax credit would increase the effectiveness of the credit immensely without charging the taxpayers a premium, and so it is the most imperative modification to the credit.

The research credit’s complexity also is a deterrent to its effectiveness. Instead of having five separate credits, with an option to claim up to three, the credit should be pared down to just the regular research credit. By changing statutory definitions of qualified research to encompass more types of research, specifically college and university research, as well as energy research, the Energy Credit and Basic Research Credit could be eliminated completely from the code. These expenditures would now be credited under the regular research credit. This would not require any credit rate changes either because all three credits share a credit rate equal to twenty percent of expenditures above a base amount.

The AIRC and ASIC are complicated substitutes for the regular research credit, giving firms the option of electing to pursue one of the three. The AIRC and ASIC are alternatives for firms that do not increase research spending year to year and therefore do not qualify for

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195. See Calmes, supra note 180.
196. GUENTHER, supra note 1, at 15.
197. See Obama-Biden Plan, supra note 193.
200. See id.
the Regular Credit. However, the nature of the AIRC and ASIC dissuades these firms from increasing their spending, so these alternate models also need modification. Once a firm elects to use the AIRC or ASIC model, it is locked in for future years to use that credit. This means if a firm that usually spent the same amount on research, and thus used the AIRC credit, increased its research spending, it would not be credited for the increased expenditures at the better rate of the Regular Credit. Because of this, that firm has no great incentive to increase its research spending. A hybrid credit would fix that.

If firms’ expenditures up to a base amount, say an average of the previous three years of research expenditures, were credited at a lower rate, fourteen percent, and spending above the base amount was credited at a higher amount, twenty percent, there would be an incentive to spend more on research than in previous years but no penalty for only spending the same amount. This would embrace the legislators’ intention of not penalizing firms that consistently spend the same amount on research while also incorporating the initial goal of the research tax credit to increase research spending. This would also eliminate the need of firms to choose a credit and be locked into that credit for years to come.

Implementing a hybrid model in place of the Regular Credit, AIRC, and ASIC would eliminate the inefficiencies of having to choose one of three different credits available while still retaining the purposes and goals of why they were created in the first place. Also, by expanding the definition of qualified research to include energy spending along with university and college research, the Energy Credit and Basic Research Credit could also be eliminated. This would leave one credit in place for everyone to use and would greatly simplify the process without sacrificing exclusion of possible research.

The research and development tax credit would increase its effectiveness with two simple changes: making the credit a permanent provision and modifying the five different available credits into one

201. Because the Regular Credit is based on a twenty percent credit of expenditures above a base amount and the base amount is determined from previous research expenditures, firms that spend consistently the same amount would be left out of the credit completely without the AIRC and ASIC.
203. The fourteen percent rate is the current rate of the AIRC and the twenty percent rate is the current Regular Credit rate.
204. This model incorporates the reasoning of not penalizing firms for spending the same amount year to year, which is why Congress created the AIRC and ASIC in the first place, while also keeping the higher rate to incentivize increased spending.
hybrid credit. This hybrid credit would create the best of both worlds without excluding any research expenditures available under any of the five current credits.