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TAX POLICY

Additional Information on the Research Tax Credit

Statement of Natwar M. Gandhi, Associate Director
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RESEARCH TAX CREDIT

SUMMARY STATEMENT OF
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In 1981 Congress created the research tax credit to enhance the competitive position of the United States in the world economy by encouraging the business community to do more research. The credit applies to qualified research spending that exceeds a base amount. The credit's availability will expire in June 1995.

In tax year 1992, corporations earned almost $1.6 billion worth of research credits, most of which was earned by large corporations in the manufacturing sector, particularly those producing chemicals (including drugs), electronic machinery, motor vehicles, and nonelectronic machinery.

GAO makes several points concerning the research tax credit.

-- The credit's net benefit to society should ideally be evaluated in terms of the ultimate benefits derived from the additional research that it stimulates and not just on the basis of how much research spending it stimulates for a given revenue cost. However, no one has been able to estimate the credit's net benefit to society. Given the absence of empirical information, GAO has not taken a position as to whether the credit should be made a permanent part of the tax code or allowed to expire.

-- The revisions that Congress made to the research credit in 1989 should have increased the amount of research spending stimulated per dollar of revenue cost. Nevertheless, GAO has found evidence that the fixed base of the credit has become too generous for some taxpayers, resulting in undue revenue losses, and may be too restrictive for others, resulting in less overall research stimulated by the credit. If the credit is extended in its current form, Congress may want to provide for reviewing this base and adjusting it as needed.

-- The research credit has been difficult for IRS to administer, primarily because the definition of qualified research spending was unclear. In 1994, the Department of the Treasury issued final regulations that may resolve this uncertainty. IRS and firms will still have to distinguish innovative from routine research. Innovative research qualifies for the credit; routine research does not.

Madam Chairman and Members of the Subcommittee:

We are pleased to be here today to provide information on the research tax credit and to discuss several issues that we believe are important to your deliberations on the future of the credit.

In 1981, Congress created the research tax credit to encourage business to do more research. It believed that an increase in research was necessary to enhance the overall competitive position of the U.S. economy. Since its enactment on a temporary basis in 1981, the credit has been extended six times and modified four times. The credit has always been incremental in nature. Taxpayers are to receive a credit only for qualified research spending that exceeds a base amount. The current rate of credit is 20 percent of that incremental amount of spending.

On the basis of our past work[1] and newly available data, we have the following four major observations to offer:

-- The research credit is primarily earned by large corporations in the manufacturing sector.

-- The credit's net benefit to society would ideally be evaluated in terms of the ultimate benefits derived from the additional research that it stimulates and not just on the basis of how much research spending it stimulates for a given revenue cost. However, once the decision has been made to provide some form of credit, the amount of spending stimulated per dollar of revenue cost is a relevant criterion for assessing alternative designs for the credit.

-- The revisions that Congress made in 1989 should have increased the amount of research spending stimulated per dollar of revenue cost. However, available evidence suggests that the fixed base of the credit has become too generous for some corporations, in the sense that a large portion of the credit they receive is for spending they probably would have done anyway. At the same time other corporations are unable to earn any credit, resulting in less overall research being stimulated. If the credit is extended in its present form, Congress may want to provide for reviewing and adjusting this base as needed.

-- The research credit has been difficult for the Internal Revenue Service (IRS) to administer, primarily because the

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[1]Preliminary Analysis of the Research and Experimentation Tax Credit (GAO/GGD-88-98BR, June 1988); The Research Credit has Stimulated Some Additional Research Spending (GAO/GGD-89-114, Sep. 1989); Pharmaceutical Industry's Use of the Research Tax Credit (GAO/GGD-94-139, May 1994); Information on the Research Tax Credit (GAO/T-GGD-95-140, April 1995). The objectives, scope and methodology of this testimony are discussed in appendix I.

definition of qualified research spending was unclear. In 1994, the Treasury Department issued final regulations that may resolve this uncertainty. However, IRS and firms will still have to distinguish innovative from routine research.

Now I will elaborate on each of these points.

CORPORATIONS USING THE RESEARCH CREDIT

In tax year 1992, corporations earned almost $1.6 billion worth of research credits.[2] Most was earned by large corporations in the manufacturing sector--71 percent by corporations with assets in excess of $250 million and 76 percent by manufacturing corporations. Within the manufacturing sector, the four subsectors that earned the most credits were those producing chemicals (including drugs), electrical equipment, motor vehicles, and nonelectronic machinery. (See Tables II.1 through II.3 for more details.)

The amount of credit earned is not equivalent to the revenue cost of the credit because not all of the credits earned can be used immediately. The general business credit limits the use of the research credit by combining it with other credits for the purpose of computing an overall limit on the reduction of a company's tax liability.[3] Although corporations earned almost $1.6 billion of research credits and had other general business credits totaling $4.5 billion (including carryforwards from prior years), they were able to use only $1.1 billion of general business credits against 1992 tax liabilities. The Joint Committee on Taxation has estimated that, if the credit were extended, by fiscal year 1998, its revenue cost would be approximately $2.2 billion per year.

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[2]These data were extracted from the IRS' Statistics of Income and exclude credits earned by individuals and partnerships. The data include S corporations, which represented about 30 percent of the corporations earning a credit but accounted for only 2.4 percent of qualified spending and 4.1 percent of the credit earned.

[3] The general business credit includes such tax credits as the targeted jobs credit and the low income housing credit. Research credits accounted for about 86 percent of the current year general business credits of companies earning a research credit in 1992. The general business credit cannot exceed net income tax minus the greater of (1) the tentative alternative minimum tax or (2) 25 percent of the net regular tax liability above $25,000.

EVALUATING THE CREDIT

The research credit is basically a transfer of money from all taxpayers to those taxpayers who exceed their base research spending. This transfer is meant to induce changes in the productive activities within the economy. It is commonly held that society benefits more from research and development spending than from nonresearch spending. But data to measure such benefits are very limited.

If the activities encouraged by the credit are, in fact, more beneficial to society than activities discouraged by this reallocation of resources, then the credit would be considered sound tax policy. We know of no studies that show whether the credit is better than alternative forms of government incentives aimed at encouraging research. We do know that the more research spending the credit stimulates per dollar of revenue cost, the better the credit would compare to other policies.

As we explain in the next section, the base calculation for the credit has an important effect on the incentive provided for increased research spending. Other factors also affect the incentive. These include the rate at which research expenses reduce tax liability, limits on the amount of general business credits that may be claimed, reductions in research expense deductions by the amount of credit claimed, and the carryover provisions for companies without sufficient tax liability to claim the credit. These factors, which affect individual companies differently, are important in determining the incentive for increased research spending provided by the credit. For example, in 1992 about 79 percent of the corporations earning research credits had accumulated more general business credits than they could use. This meant that additional research credits earned by these corporations could not be used against current tax liabilities, thus reducing the marginal incentive provided by the credit.

ISSUES RELATING TO THE BASE OF THE CREDIT

The rules for determining the base spending amount to be used when calculating the credit have a critical impact on the credit's effect.[4]

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[4]Corporations can receive credits three different ways. First, they can earn credits for undertaking research themselves. For convenience, we will refer to this as the "regular" credit. Corporations can also earn credits for funding basic research by qualified organizations (primarily universities). This basic research credit accounted for less than 2 percent of the total amount of research credit earned in 1992, and the rules for computing this credit are different from those for the regular

To stimulate the most research spending per dollar of tax revenue forgone, the credit should be designed to give a benefit for research spending that firms undertake above and beyond the amount they would have spent in the absence of the credit. Conversely, no reward should be given for research that firms would have undertaken anyway. Unfortunately, it is impossible to determine accurately the amount of qualified research that firms would have undertaken without the credit. When discrepancies exist between this "ideal" base for the credit and whatever base is used in practice, the result is that firms are rewarded either too much or not enough for their spending behavior.

Prior to 1990, the base of the regular credit was equal to the average of qualified expenditures for the 3 previous tax years or to 50 percent of the current year's expenditures, whichever was greater. Although this base may have been a fairly good approximation of the ideal base, it had a serious flaw. The moving average base established a link between the taxpayer's current spending and future base amounts in a manner that substantially reduced the incentive provided to many companies. Specifically, each dollar spent in any year raised the base by 33 cents in each of the next 3 years, thus reducing the credit available in those years.

In our 1989 study, we estimated that, at the margin, the previous credit provided companies a benefit of 3 to 5 cents per dollar of additional research spending. We further estimated that this incentive stimulated between $1 billion and $2.5 billion of additional research spending between 1981 and 1985 at a cost of $7 billion in tax revenues. Thus, each dollar of taxes forgone stimulated between 15 and 36 cents of research spending. Although the amount of research spending stimulated by the credit was well below the credit's revenue cost, total benefits could have been much higher.

The revision of the credit in 1989 significantly increased the effective incentive of the regular credit by breaking the link between current spending and future base amounts. For most credit recipients, this new base is related to the ratio of research spending to gross receipts during the period 1984 through 1988. To arrive at the base amount, this ratio or "fixed base percentage," as it is known, is multiplied by the taxpayer's average annual gross receipts for the 4 years preceding the current tax year. (Table III.1 provides a sample computation under the new rules.)

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credit. Finally, corporations can receive flow-through research credits from other taxpayers. Flow-through credits also accounted for less than 2 percent of total research credits in 1992. The remainder of our testimony will focus on the regular research credit.

One concern about the current base is that the spending behavior that individual firms exhibited from 1984 through 1988 may not be reflective of the spending that those firms would engage in now if the credit did not exist. The current base is appropriate as long as firms' ratios of spending to gross receipts are fairly constant over time. To the extent that taxpayers change their spending behavior over time, the credit computation would be too generous for some taxpayers, resulting in undue revenue losses. At the same time, it would deny others the opportunity to earn the credit, thus stimulating less overall research. Our analysis of corporate taxpayer data indicates that the accuracy of the credit's base has eroded significantly since 1989, which suggests the need for some adjustment to ensure that the credit provides an attractive incentive at an acceptable revenue cost.

Our analysis shows that the current computation rules are too generous for most corporations that earn the credit, in the sense that a large portion of the credit they receive is for spending they probably would have done anyway. We also found some evidence that many corporations earning the credit prior to the 1989 revision were unable to earn it in 1992.[5]

Our analysis first determined how many corporations' current research spending was at least double their base amounts. Corporations in this situation become subject to a special rule, that resets their base amount equal to half of their current year's spending. As we explain more fully in appendix IV, having large numbers of corporations subject to the special rule indicates a problem with the credit's design for two reasons. First, the effective incentive that the credit provides in this situation is cut in half, because each additional dollar a corporation spends raises its base by 50 cents. Second, given that other studies' most optimistic assumptions imply a stimulative effect of no more than 30 percent, it is unlikely that the credit leads corporations to come close to doubling their spending on research. Consequently, a significant portion of the credit earned by corporations whose current research expenditures are far above their bases is earned for spending that they probably would have done anyway.

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[5]Although our evidence concerning cases where the base is too low is stronger than our evidence concerning the opposite problem, this may simply be due to the fact that the former situation is much easier to detect. Corporations that earn a research credit in a given year report both their current research expenditures and their base amount on IRS form 6765. However, if research spending does not exceed the base amount, no credit will be earned and, therefore, no form will be filed. IRS databases do not contain information on research spending by companies that do not file the form.

We have found that, in 1992, almost 60 percent of the corporations that reported some regular research spending on their tax return were subject to the special 50-percent base rule. These corporations accounted for about 19 percent of the regular spending done and 40 percent of the regular credit earned by all corporations reporting spending. Small corporations were much more likely to be in this situation than were large corporations. We have not yet determined the reasons for this. (App. IV provides additional information on the characteristics of these corporations.)

Our second analysis involved tracking the credit-earning experience of individual corporations from 1989 through 1992. Unfortunately, the database that we were able to construct included only corporations with assets of at least $50 million, so we can provide no insight into the experiences of smaller companies. The roughly 1,600 corporations that we could examine accounted for about 73 percent of the research credit earned in 1989.

The corporations we studied exhibited a wide variety of credit-earning patterns over the 4-year period, but the percentage of them that earned a credit declined every year between 1989 and 1992. In 1989, 65 percent of these corporations were able to earn a regular credit, but by 1992 less than 54 percent of them could. We do not know how much of this decline can be attributed to the change in the credit's design after 1989, but the pattern does indicate that a growing number of large corporations are not able to surpass their historic rates of spending (see app. IV for more details.)

ADMINISTRATION OF THE RESEARCH CREDIT

In our earlier work, we concluded that the credit was relatively difficult for IRS to administer. This conclusion was based on our survey of IRS revenue agents who audited large companies for tax years 1981 through 1986. The survey found that these IRS revenue agents questioned the credit claimed by 79 percent of the corporations in which the credit was audited, and that 54 percent of the revenue agents found at least one issue or aspect of the credit difficult to audit. Revenue agents most frequently cited the following four reasons for questioning research expenditures: Rather than for qualifying, innovative research, the expenditures were for (1) adapting existing capabilities, (2) routine or cosmetic alterations, (3) overhead and administration, or (4) ordinary testing. In general, most of these agents found it difficult to distinguish spending for new products or functions from spending that paid for routine or cosmetic changes.

Our interviews with IRS for our 1994 report indicated that this difficulty remained. IRS officials reported that they were required to make difficult technical judgments in their audits

concerning whether research was directed to produce truly innovative products or processes. An IRS official stated that, although examination teams often included engineers and other specialists enlisted to address technical issues that arose, IRS still had difficulty matching the technical expertise of the companies' specialists.

In our 1989 survey, about one-fifth of the revenue agents said the definition of qualified research was unclear. One reason cited was the lack of final regulations. The succession of proposed regulations issued in 1983, 1989, and 1993 to define qualified research under section 174 of the tax code created uncertainty about the definition of qualified research and contributed to the difficulty in auditing the research credit. All research spending that qualifies for the credit must first qualify under section 174. In 1994, Treasury issued final regulations that may resolve the uncertainty about the definition of qualified research spending. However, the difficulty of distinguishing innovative from routine research remains.

Audits of the research credit can be burdensome for both IRS and the taxpayer because the audits must determine whether research expenses, such as wages and supply costs, were made in support of research activities that qualify for the credit. The taxpayer is thus required to show that expenses supported qualified research activities. Where detailed project accounting does not exist, both IRS and the taxpayer may find it difficult to separate out after the fact the cost of personnel employed in specific projects. Thus, according to an IRS official, the costs of administering the credit are substantial for both IRS and the taxpayer.

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In summary, Madam Chairman, given the lack of empirical information for evaluating the credit's net benefit to society, we have not taken a position as to whether the research credit should be made a permanent part of the tax code or allowed to expire. We have, however, concluded that, if the Congress decides to extend the credit in its current form, it may also want to ensure that the credit provides an attractive incentive to most recipients at an acceptable revenue cost. One way this could be done is by requiring that the base be reviewed and adjusted as needed.

That concludes my summary statement. We welcome any questions that you may have.

APPENDIX I

OBJECTIVES, SCOPE AND METHODOLOGY

Our objectives in preparing this testimony were

-- to determine how many and what types of corporations are earning the research tax credit;

-- to provide information indicating how well the current design of the credit's base is working; and

-- to show how interactions with other provisions of the tax code have affected the incentive provided by the credit.

To determine how many and what types of corporations are earning the research tax credit, we analyzed IRS' Statistics of Income (SOI) sample of corporate taxpayers for tax year 1992. This sample is statistically representative of the full corporate taxpayer population for that year. We identified all corporations that earned a research credit in 1992 and showed how they were distributed by asset class, by industry, and by manufacturing subsector (for those in the manufacturing sector). The results of our analysis are shown in appendix II, tables 1 through 3.

To provide an indication of how well the current design of the credit is working, first, we identified the number of corporations that received considerable portions of their credits for spending that they probably would have done anyway. Second, we tracked the credit earning experience of 1,573 large corporations from 1989 through 1992 to see if these corporations were having greater difficulty earning the credit since it was redesigned after 1989. Our analyses of the base of the credit are explained in detail in appendix IV.

To show how interactions with other provisions of the tax code have affected the incentive provided by the credit, we used SOI's 1992 corporate taxpayer sample to determine what percentages of the corporations earning research credits had accumulated more general business credits than they could use. Corporations in this position could not use additional credits that they earned against current liabilities, reducing the marginal incentive of the credit.

We did our work in April and May 1995 in accordance with generally accepted government auditing standards.

APPENDIX II

CORPORATIONS EARNING THE RESEARCH CREDIT

Table II.1 : Number of Corporations Earning Research Credits, Amount of Qualified Spending, and Amount of Credit Earned by Asset Class, 1992

	Corporations earning research credits			Percent of total		
	Number	Qualified spending ($ million)	Credits earned ($ million)	Corporations	Qualified spending	Credits earned
Asset range						
Less than $250,000	1,615	$308	$17	14.8%	0.8%	1.1%
From $250,000 to $1 million	2,377	316	25	21.8	0.8	1.6
$1 million to $10 million	4,144	1,842	129	37.9	4.6	8.2
$10 million to $50 million	1,485	2,025	121	13.6	5.1	7.6
$50 million to $100 million	364	2,865	72	3.3	7.2	4.6
$100 million to $250 million	321	1,683	96	2.9	4.2	6.1
$250 million or more	622	30,719	1,119	5,7	77.3	70.9
Total	10,928	$39,757	$1,580	100.0	100.0	100.0

Note : The numbers are based on sample data and consequently are subject to sampling error. Totals may not equal the sum of the details due to rounding.

Source: GAO analysis of IRS statistics of income data on corporations for tax year 1992.

APPENDIX II

CORPORATIONS EARNING THE RESEARCH CREDIT

Table II.2 : Percent Distribution of Corporations, Qualified Spending, and Credit Earned by Industrial Sector, 1992.

	Corporations earning research credits		
Industry	Percent of corporations	Percent of qualified spending	Percent of credit
Agriculture	1.2	0.2	0.3
Mining	0.2	0.4	0.2
Construction	0.5	0.1	0.2
Manufacturing	65.3	76.6	75.8
Transportation and public utilities	1.7	8.2	6.2
Wholesale trade	5.6	1.3	2.1
Retail trade	1.3	0.3	0.5
Finance	0.9	0.6	1.1
Services-medical, business	23.3	12.3	13.5
Total all industries	100	100	100

Note : The percentages are based on sample data and consequently, are subject to sampling error. Totals may not equal the sum of the details due to rounding.

Source: GAO analysis of IRS statistics of income data on corporations for tax year 1992.

APPENDIX II

Table II.3 : Percent Distribution of Corporations Earning Research Credits, Qualified Spending, and Credit Earned by Manufacturing Subsector, 1992

	Corporations earning research credits		
	Percent of corporations	Percent of qualified spending	Percent of credit
Manufacturing sector			
Chemicals & allied:	14.2	28.1	30.1
Drugs	7.6	16.6	22.1
Petroleum	0.4	3.1	2.0
Machinery:	9.4	14.3	13.7
Construction	0.3	1.7	1.0
Computing	2.1	10.7	9.9
Electrical equipment:	29.8	17.4	18.1
Radio & T.V.	3.1	4.6	4.3
Electronic components	15.8	8.3	10.1
Other electrical	10.4	4.2	3.4
Motor Vehicles	0.7	17.4	16.7
Transportation equipment:	1.0	1.0	1.1
Aerospace	0.9	0.9	0.8
Instruments:	14.7	9.7	8.5
Scientific	6.5	3.7	2.3
Medical & optical	7.2	3.6	5.7
Photographic	1.1	2.4	0.6
Other industries	29.8	8.9	9.8
Total all manufacturing	100	100	100

Note : The percentages are based on sample data and consequently, are subject to sampling error. Totals may not equal the sum of the details due to rounding.

Source: GAO analysis of IRS statistics of income data on corporations for tax year 1992.

BACKGROUND ON THE RESEARCH CREDIT

The research tax credit has had an eventful history. Believing that an increase in research was necessary to enhance the overall competitive position of the U.S. economy, Congress created the credit in 1981 to encourage businesses to do research. Since that time, Congress has made many changes to the credit. In its current form, the credit reduces a company's tax liability by 20 percent of the amount of additional research expenditures above a computed base.

FEDERAL TAX SUBSIDIES RELATED TO RESEARCH ACTIVITIES

Two sections of the Internal Revenue Code provide guidance related to research and experimentation. Section 174 covers the tax deductibility of research activities, and section 41 pertains to the research credit.

Deducting Research Expenses Under Section 174

Section 174 offers taxpayers two ways of treating funds invested in research activities. They may capitalize these investments and write them off over a minimum 5-year period, or they may deduct the costs of research expenditures on a current-year basis. The Joint Committee on Taxation has projected that the tax expenditures related to deducting research expenditures under the two options will be $11.4 billion from 1994 through 1998 for all industries.[6]

The tax code does not specifically define research for section 174 purposes, except to exclude such costs as expenditures for exploration or for the acquisition or improvement of depreciable or depletable property or land. Treasury regulations adopted under section 174 defined qualified research as "research and development costs in the experimental or laboratory sense." It includes all expenditures to develop, and some expenditures to improve plant processes, products, formulas, or inventions.

The definition of qualified research expenditures under section 174 has been unclear. Treasury issued regulations in 1957 defining research expenditures. However, in order to clarify the definition of qualified research expenses, Treasury proposed regulations redefining research in January 1983. In May 1989,

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[6]Tax expenditures are defined as those revenue losses attributable to provisions of the federal tax laws that allow a special exclusion, exemption, or deduction from gross income or that provide a special credit, a preferential rate of tax, or a deferral of tax liability.

APPENDIX III

regulations were proposed that replaced the 1983 proposal.[7] In March 1993, Treasury issued new proposed regulations. In 1994, Treasury issued final regulations that may resolve the uncertainty about the definition of qualified research spending.

Until 1989, taxpayers were allowed to use research expenditures to decrease their tax liabilities both under section 174 and through the research tax credit. Congress limited this dual benefit with the Technical and Miscellaneous Revenue Act of 1988,[8] reducing the amount of research expenditures taxpayers could otherwise deduct under section 174 by 50 percent of the research tax credit determined for the year. The Omnibus Budget Reconciliation Act of 1989[9] reduced the deduction under section 174 by the full amount of the research tax credit determined for the year.

Claiming the Research Tax Credit Under Section 41

Section 41 of the Internal Revenue Code allows taxpayers to claim the research tax credit, which is equal to 20 percent of the excess of qualified research expenses of the taxable year over a base amount. The base amount is a product of a fixed-base percentage multiplied by the taxpayer's average annual gross receipts for the 4 preceding tax years. The fixed-base percentage is calculated by dividing the company's qualified research expenditures for the years 1984 through 1988 by gross receipts for the same period.

Those companies that do not have gross receipts in at least 3 years during the 1984 through 1988 period are considered start-up firms and are assigned a fixed-base percentage of 3 percent for each of their first 5 taxable years after 1993 in which they incur qualified research expenditures. The taxpayers' fixed-base percentage is to be gradually increased for their 6th through 10th taxable years after 1993 in which they incur qualified research expenditures. After the 10th year, the fixed-base percentage is to be the actual ratio of qualified research expenditures to gross receipts for 5 years selected by the taxpayer from its 5th through 10th taxable years.

Although the research tax credit has additional restrictions on qualified research, before a research expenditure can be used in calculating the tax credit, the expenditure must first qualify

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[7]Proposed regulations are issued prior to finalization in order to permit public comment and administrative consideration.

[8]100-647, Nov. 10, 1988.

[9]101-239, Dec. 19, 1989.

under section 174. Qualified research expenditures, in general, include (1) in-house expenses for wages paid for qualified research services and supplies used in research, (2) payments for the right to use computers for qualified research, and (3) 65 percent of the payments made for contract research done on the taxpayer's behalf. (Table III.1 gives a sample calculation of a claim for the research tax credit under the most recent provisions.)

APPENDIX III

Table III.1: Sample Calculation of the R&E Tax Credit for 1990[10]

Dollars in thousands

Year	Receipts	Qualified research expenditures
1984	$150,000	$25,000
1985	$300,000	$45,000
1986	$400,000	$30,000
1987	$350,000	$35,000
1988	$450,000	$50,000
1989	$500,000	$55,000
1990	$650,000	$73,000

Calculations	
Compute the fixed base percentage	
1. Total the qualified research expenditures for 1984-1988	$185,000
2. Total the gross receipts for 1984-1988	$1,650,000
3. Divide qualified research expenditures by gross receipts to determine the fixed-base percentage	11.21%
Compute the base amount for 1990	
1. Calculate the average receipts for the 4 preceding years (1986-1989)	$425,000
2. Multiply by fixed-base percentage to determine base amount	$47,643
Compute the tax credit	
1. Take research expenses for 1990 ($73,000) and subtract base amount ($47,643) or 50% of 1990's qualified research expenses ($36,500), whichever is more	$25,357
4. Multiply this amount by 20% to determine the R&E tax credit for 1990	$5,071

[10]The example is for an established firm. Special rules apply to start-up companies.

HISTORY OF THE RESEARCH TAX CREDIT

Since its enactment in 1981,[11] the research tax credit has been modified four times and extended six times. It originally contained the following provisions:

-- The research tax credit equaled 25 percent of the qualified research expenditures that exceeded the base amount.

-- It had a base period amount that equaled the average expenditures for the 3 previous years or 50 percent of the current year's expenditures, whichever was greater.

-- It contained a 3-year carryback and a 15-year carryforward provision.

-- The credit was in effect from July 1, 1981, through December 31, 1985.

-- The credit excluded the following from the definition of qualified research: research done outside the United States, research in the humanities or social sciences, and research funded by another person or governmental entity.

The Tax Reform Act of 1986[12] modified the tax credit so that it targeted research undertaken to discover technological information that pertained to the functional aspects of products. In addition, the act

-- reduced the credit to 20 percent;

-- narrowed the definition of qualified expenditures by clarifying that the research was to be technological in nature;

-- excluded expenses of leasing personal property;

-- established a separate 20-percent tax credit for payments to a university for basic research;

-- made the tax credit part of the general business tax credit,[13] thus subjecting it to a yearly cap; and

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[11]Economic Recovery Tax Act (P.L. 97-34, Aug. 13, 1981).

[12]99-514, Oct. 22, 1986.

[13]The general business credit combines several tax credits, including the research credit, for the purpose of computing an overall dollar limitation on the reduction of a company's tax liability. The general business credit may not exceed net income tax minus the greater of (1) the tentative minimum tax or (2) 25 percent of the net regular tax liability above $25,000.

-- extended the tax credit from January 1, 1986, to December 31, 1988.

The Technical and Miscellaneous Revenue Act of 1988 extended the credit for 1 year. It also reduced deductions allowed under section 174 for qualified research expenses by 50 percent of the credit determined for the year.

The Omnibus Budget Reconciliation Act of 1989 removed the original 3-year moving average method of computing the base, which had reduced the incentive for companies to undertake additional research spending. Under the 3-year moving average, the amount a taxpayer spent on research in a given year became part of the base in following years. The increase in research spending also increased the future base, thus lowering the credit the taxpayer would receive in subsequent years. Specifically, the 1989 act made the following stipulations:

-- The 3-year moving average was replaced by a base amount equal to a ratio of total qualified research expenses to total gross receipts for the period 1984 through 1988 (the "fixed-base percentage"), multiplied by the average amount of the taxpayer's gross receipts for the 4 preceding years.

-- The credit was made available to start-up companies that planned to use the results of their research on a future trade or business. Companies that did not have both qualified research expenses and gross receipts during each of at least 3 years between 1984 through 1988 were assigned a fixed-base percentage of 3 percent.

-- The deduction allowed under section 174 for qualified research expenses was reduced by 100 percent of the research credit determined for the year.

-- The act effectively extended the credit for 9 months by prorating qualified expenses incurred before January 1, 1991.

The Omnibus Budget Reconciliation Act of 1990[14] extended the credit through December 31, 1991, and repealed the special rule to prorate qualified expenses incurred before January 1, 1991. The Tax Extension Act of 1991[15] extended the credit through June 30, 1992.

The Omnibus Budget Reconciliation Act of 1993[16] extended the credit from July 1, 1992, through June 30, 1995, and modified the fixed-base percentage for start-up companies.

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[14]101-508, Nov. 5, 1990.

[15]102-227, Dec. 11, 1991.

[16]103-66, Aug. 10, 1993.

EVIDENCE OF PROBLEMS WITH THE FIXED BASE OF THE CREDIT

This appendix describes the analyses we used to determine how well the existing base computation rules for the credit are working. It was much easier to detect cases where the credit's computation rules are too generous than it was to detect cases where they are too restrictive. Corporations that earn a research credit in a given year report both their current research expenditures and their base amount on IRS form 6765. However, if research spending does not exceed the base amount, no credit will be earned and, therefore, no form need be filed. IRS databases do not contain information on research spending by corporations that do not file the form.

We used SOI's 1992 corporate taxpayer sample to show how many and what types of corporations had current year research spending well in excess of their base amounts. In order to provide some indication of the extent to which corporations are excluded from earning the credit because their base spending amounts are too high, we tracked the credit earning experience of a subsample of corporations over the period 1989 through 1992.

For our first analysis, we started with the full corporate sample for 1992 and then deleted all corporations that did not report at least some regular research spending. We also deleted 104 sample observations, representing 440 corporations, with significant inconsistencies between their reported spending and their reported credits.[17] Our final subsample represented 11,600 corporations. Our basic approach was to determine how many of these corporations were subject to the 50 percent base limit that is part of the credit computation rules. If a corporation's current regular research spending is more than twice that corporation's base spending amount, as computed under the standard rules, then the base automatically becomes 50 percent of its current year spending.

There are two reasons why having large numbers of corporations subject to the 50-percent base limit would indicate a problem with the credit's design. First, for corporations subject to the limit, the effective incentive of the credit is cut in half. Normally, the corporation would earn 13 cents for each additional dollar spent on qualified research above its base (after taking

[17]If we had left these observations in, our basic findings would not have changed materially. The percentage of corporations subject to the 50-percent base limitation would have been 58.6, instead of 59.6, their percentage share of regular spending would have been 19.8, instead of 18.8, and their percentage share of regular credit would have been 43.7 instead of 40.0.

into account the offset against the section 174 deduction).[18] Under the 50-percent limit, however, each additional dollar spent would raise the base by 50 cents. The corporation, therefore, would earn only 6.5 cents worth of credit for each additional dollar spent.

The second reason for concern about large numbers of corporations being in this position is that, despite the limitation, a large portion of the credit they receive is earned on spending that probably would have been done even in the absence of the credit. This is because corporations subject to the 50-percent limit earn credit on spending that is up to 100 percent over their base. Yet, even under generous assumptions concerning the effectiveness of the credit in stimulating additional research spending, it is unlikely that the credit has led corporations to increase their spending by more than 30 percent above what it would have been without the credit.[19]

We found that, in 1992, almost 60 percent of the corporations that reported some regular research spending were subject to the 50 percent base limit. These corporations accounted for about 19 percent of the regular spending done and 40 percent of the regular credit earned by corporations in that subpopulation. Approximately 77 percent of the corporations in the subpopulation had current year spending that exceeded their base amounts by more than 30 percent. They accounted for about 45 percent of regular spending and 79 percent of the regular credit.

Corporations with fixed-base percentages less than or equal to 3 percent were much more likely to be subject to the 50-percent base limit than other corporations (Table IV.1).[20] The minimum

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[18]A corporation earns 20 cents of credit for every dollar of research spending above its base. The corporation's deduction under section 174 is reduced by 20 cents. The lost value of the deduction to the corporation equals 20 cents multiplied by the corporate tax rate (currently 35 percent), or 7 cents. The net tax benefit, therefore, equals 13 cents.

[19]Almost all of the economic studies that have examined the responsiveness of research and development spending (R&D) to changes in price of R&D show that a 1 percent decrease in the after-tax price of R&D leads to less than a 2 percent increase in R&D spending over the long run. Most studies show considerably less responsiveness. Combining the generous two-to-one ratio with the 13 percent reduction in the after-tax price of R&D provided by the credit, implies a growth in spending of 26 percent due to the credit.

[20]Taxpayers that did not have both qualified research expenditures and gross receipts during each of at least 3 years between 1984 through 1988 were assigned a fixed-base percentage of 3 percent.

fixed-base percentage is zero, the maximum is 16. Three-quarters of the subsample, accounting for about 45 percent of regular spending and 50 percent of regular credit, had fixed-base percentages less than or equal to 3 percent (Table IV.2).

Small corporations were much more likely to be in the 50-percent limit position than were large corporations. Approximately 83 percent of the corporations in the subpopulation with assets of less than $250,000 were subject to the limit, compared to only 27 percent for corporations with assets in excess of $250 million (Table IV.3). We have not yet determined the reasons for this. The differences do not appear to be explained entirely by the fact that small corporations tend to have lower fixed-base percentages than do large corporations.

The percent of corporations subject to the limit did not vary greatly across the industries that earn most of the credit--manufacturing, nonfinancial services, and transportation and public utilities (Table IV.4). Within the manufacturing sector, corporations in the drugs subsector were most likely to be in the limit position, while corporations in the construction machinery subsector were the least likely.

As noted above, data are not readily available on the number of corporations that are unable to earn a research credit because their spending falls below their base amounts. The best we could do was to construct a "panel" database containing all large ($50 million or more in assets) research-reporting corporations that were present in SOI's samples every year from 1989 through 1992.[21] By "research-reporting" we mean corporations that reported some research spending or some research credit (including basic and flow-through credits) in any year during that timeframe. There were 1,573 corporations in the panel and they accounted for approximately 73 percent of all research credits earned in 1989. Unfortunately, the database does not permit us to provide any insight into the experience of small corporations.

We determined how many corporations in the panel were able to earn regular research credits in each year. These corporations exhibited a wide variety of credit-earning patterns over the 4-year period, but the percentage of them that earned a credit declined every year between 1989 and 1992 (Table IV.6). In 1989, 65 percent of these corporations were able to earn a regular credit, but by 1992 less than 54 percent of them could. Almost

[21]A "panel" is a database that contains observations of the same individuals or entities over time. Given time constraints, we were not able to include corporations with assets of less than $50 million in our panel. SOI attempts to include all corporations with assets of at least $50 million in its sample every year, so multiple years of data are more readily available for them.

APPENDIX IV

14 percent of the corporations earning a credit in 1989 did not earn any throughout the remainder of the period. We do not know how much of the decline can be attributed to the change in the credit's design after 1989, but the pattern does indicate that a growing number of large corporations have not been able to surpass their historic rates of spending.

The decline in the credit-earning ability of the manufacturing sector is parallel to the overall decline. Within the manufacturing sector, the largest rates of decline were within the motor vehicles and aerospace subsectors (Table IV.7).

Table IV.1: Percentage of Research Corporations Subject to the 50-Percent Base Limit, by Fixed-Base Percentage, Tax Year 1992

Fixed-base percentage	Corporations subject to the 50 percent base limitation		
	As a percent of all research corporations in the range	Percent share of regular spending done by all research corporations in the range	Percent share of regular credit earned by all research corporations in the range
Less than 3	67.4	18.2	38.3
3	72.2	84.9	92.2
Greater than 3 less than 5	32.9	9.1	20.8
Greater than 5 less than 10	23.5	7.2	16.7
Greater than 10 less than 16	33.9	25.3	63.1
16	28.6	46.1	53.6
All research corporations	59.6	18.8	40.0

Note: These data exclude corporations that reported no "regular" research spending. The numbers are based on sample data and consequently are subject to sampling error. The figures for all research corporations include those for 47 corporations that failed to report valid fixed-base percentages.

Source: GAO analysis of IRS Statistics of Income data on corporations for tax year 1992.

Table IV.2: Distribution of Research Corporations, Their Research Spending, and Their Research Credits, by Fixed-Base Percentage, Tax Year 1992

Fixed-base percentage	Number of corporations	Percent of total	Amount of regular spending (in millions)	Percent of total	Amount of regular credit (in millions)	Percent of total
Less than 3	4,756	41.0	15,218	39.8	572	40.1
3	3,960	34.1	2,100	5.5	151	10.6
Greater than 3 less than 5	673	5.8	5,723	15.0	194	13.6
Greater than 5 less than 10	1,135	9.8	8,644	22.6	283	19.9
Greater than 10 less than 16	462	4.0	3,422	8.9	127	8.9
16	566	4.9	1,313	3.4	81	5.7
Total all research corporations	11,600	100.0%	$38,259	100.0%	$1,426	100.0%

Note: These data exclude corporations that reported no "regular" research spending. The numbers are based on sample data and consequently are subject to sampling error. The figures for all research corporations include those for 47 corporations that failed to report valid fixed-base percentages.

Source: GAO analysis of IRS Statistics of Income data on corporations for tax year 1992.

Table IV.3: Percentage of Research Corporations Subject to the 50-Percent Base Limit, by Size of Assets, Tax Year 1992

Asset range	Corporations subject to the 50-percent base limitation		
	As a percent of all research corporations in the asset range	Percent share of regular spending done by all research corporations in the asset range	Percent share of regular credit earned by all research corporations in the asset range
Less than $250,000	83.2%	93.6%	97.9%
$250,000 to $1 million	75.5	87.3	94.7
$1 million to $50 million	56.7	64.9	77.3
$10 million to $50 million	41.5	47.7	67.1
$50 million to $100 million	40.5	49.2	68.7
$100 million to $250 million	37.0	40.0	59.9
$250 million or more	27.0	10.4	25.8
All research corporations	59.6	18.8	40.0

Note: These data exclude corporations that reported no "regular" research spending. The numbers are based on sample data and consequently are subject to sampling error. The figures for all research corporations include those for 47 corporations that failed to report valid fixed-base percentages.

Source: GAO analysis of IRS Statistics of Income data on corporations for tax year 1992.

Table IV.4: Percentage of Research Corporations Subject to the 50-Percent Base Limit, by Industry, Tax Year 1992

Industry	Corporations subject to the 50-percent base limitation		
	As a percent of all research corporations in the industry	Percent share of regular spending done by all research corporations in the industry	Percent share of regular credit earned by all research corporations in the industry
Agriculture	64.7%	24.5%	43.9%
Mining	26.5	0.5	2.5
Construction	43.8	33.4	53.2
Manufacturing	57.3	13.1	29.0
Transportation & public utilities	60.0	18.3	49.1
Wholesale trade	75.3	57.8	78.5
Retail trade	48.9	71.4	87.0
Finance	76.6	43.0	70.7
Services--medical, business	63.0	66.3	83.3
All industries	59.6	18.8	40.0

Note: These data exclude corporations that reported no "regular" research spending. The numbers are based on sample data and consequently are subject to sampling error. The figures for all industries include those for 47 corporations that failed to report valid fixed-base percentages.

Source: GAO analysis of IRS Statistics of Income data on corporations for tax year 1992.

Table IV.5: Percentage of Research Corporations Subject to the 50-Percent Base Limit, by Manufacturing Sector, Tax Year 1992

Manufacturing sector	Corporations subject to the 50-percent base limitation		
	As a percent of all research corporations in the sector	Percent share of regular spending done by all research corporations in the sector	Percent share of regular credit earned by all research corporations in the sector
Chemicals & allied	59.5%	13.1%	22.2%
Drugs	80.8	15.8	23.4
Petroleum	59.7	0.7	2.2
Machinery	39.7	13.8	36.5
Construction	13.6	2.9	10.0
Computing	53.3	12.5	35.4
Electrical equipment	64.4	18.9	39.1
Radio & TV	42.7	13.6	36.4
Electronic components	66.4	20.3	36.2
Other electrical	69.7	22.4	51.9
Motor vehicles	45.2	1.1	2.7
Transportation equipment	46.7	3.1	28.8
Aerospace	50.6	2.4	26.0
Instruments	48.0	18.6	47.4
Scientific	32.0	7.3	26.5
Medical & optical	56.8	44.3	59.8
Photographic	84.2	0.9	10.0
Other industries	61.2	22.4	49.1
All manufacturing	57.3	13.1	29.0

Note: These data exclude corporations that reported no "regular" research spending. The numbers are based on sample data and consequently are subject to sampling error. The figures for all manufacturing include those for 47 corporations that failed to report valid fixed-base percentages.

Source: GAO analysis of IRS Statistics of Income data on corporations for tax year 1992.

Table IV.6: Percentage of Corporations in the Panel Able to Earn a Regular Credit Each Year, by Industry, Tax Years 1989 Through 1992

Industry	Number of corporations in the industry	As a percent of all corporations in the panel	Percent of corporations in the industry earning regular credits			
			1989	1990	1991	1992
Agriculture	8	0.5%	87.5%	62.5%	37.5%	37.5%
Mining	28	1.8	53.6	39.3	35.7	35.7
Construction	13	0.8	53.9	38.5	38.5	38.4
Manufacturing	1,080	68.6	69.2	63.4	59.1	57.5
Transportation and public utilities	145	9.2	52.4	43.5	46.9	46.9
Wholesale trade	95	6.0	64.2	61.1	53.7	43.2
Retail trade	31	2.0	45.1	54.8	51.6	48.4
Finance	84	5.3	42.9	28.6	31.0	38.0
Services-medical	90	5.7	66.7	61.1	63.3	54.5
Total all industries	1,575	100.0	a	a	a	a

a. The percentages for all industries were 65.0 in 1989, 58.5 in 1990, 55.5 in 1991, and 53.6 in 1992.

Note: The panel consists of large corporations that (1) were present in the Statistics of Income corporate sample every year from 1989 through 1992 and (2) reported research spending or a research credit in at least one of those years. Totals may not equal the sum of the details due to rounding.

Source: GAO analysis of IRS Statistics of Income data on corporations for tax years 1989 through 1992.

Table IV.7: Percentage of Corporations in the Panel Able to Earn a Regular Credit Each Year, by Manufacturing Sector, Tax Years 1989 Through 1992

Manufacturing sector	Number of corporations in the sector	As a percent of all manufacturing corporations in the panel	Percent of corporations in the industry earning regular credits			
			1989	1990	1991	1992
Chemicals	161	14.9%	81.4%	78.3%	73.2%	68.9%
Drugs	42	3.9	90.5	88.1	78.5	85.6
Petroleum	21	1.9	61.9	52.3	47.6	42.8
Machinery	132	12.2	75.0	67.4	57.6	55.3
Construction machinery	14	1.3	64.3	50.0	50.0	78.6
Computing & accounting machinery	40	3.7	85.0	72.5	70.0	65.0
Electrical & electronic equipment	161	14.9	70.0	67.7	65.9	68.3
Radio, TV & commercial	22	2.0	68.2	63.7	68.2	68.2
Electronic components	82	7.6	70.7	68.3	65.8	70.7
Other electric equipment	47	4.4	72.3	70.2	65.9	68.0
Motor vehicles	41	3.8	82.9	68.3	51.2	51.2
Transportation	31	2.9	45.2	48.4	45.1	38.7
Aircraft, guided missiles & parts	25	2.3	52.0	48.0	48.0	32.0
Instruments & related products	86	8.0	80.2	64.0	65.1	65.1
Scientific instruments	29	2.7	75.9	48.3	51.7	58.6
Optical & medical instruments	53	4.9	83.0	73.6	75.5	69.8

APPENDIX IV

Table IV.7: (Continued)

Other manufacturing industries	445	41.2%	61.6%	56.2%	53.2%	51.2%
Total all manufacturing	1,080	100.0%	a	a	a	a

a. The percentages for all manufacturing were 69.2 in 1989, 63.4 in 1990, 59.1 in 1991, and 57.5 in 1992.

Note: The panel consists of large corporations that (1) were present in the Statistics of Income corporate sample every year from 1989 through 1992 and (2) reported research spending or a research credit in at least one of those years. Totals for the first 2 columns will equal the sum of the major sectors, except for rounding errors.

Source: GAO analysis of IRS Statistics of Income data on corporations for tax years 1989 through 1992.

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