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RESEARCH AND EXPERIMENTATION TAX CREDIT

HEARING

BEFORE THE

SUBCOMMITTEE ON TAXATION AND IRS OVERSIGHT

OF THE

COMMITTEE ON FINANCE

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RESEARCH AND EXPERIMENTATION TAX CREDIT

MONDAY, APRIL 3, 1995

U.S. SENATE,
SUBCOMMITTEE ON TAXATION AND IRS OVERSIGHT,
COMMITTEE ON FINANCE,
Washington, DC.

The hearing was convened, pursuant to notice, at 9:30 a.m., in room SD–215, Dirksen Senate Office Building, Hon. Orrin G. Hatch (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. ORRIN G. HATCH, A U.S. SENATOR FROM UTAH, CHAIRMAN OF THE SUBCOMMITTEE

Senator HATCH. Good morning. We are happy to welcome all of you to today's hearing, which is to examine the research and experimentation tax credit which will expire on June 30, 1995 unless Congress acts to extend it.

We have asked the witnesses to address three aspects of the credit in their testimonies. One, whether the credit should be made a permanent part of the Tax Code in its current form; two, whether it should be allowed to expire; and three, whether the credit should be restructured to make it more effective.

We will also examine the issue of the allocation of research expenses between foreign and domestic source income for multi-national companies.

As the United States has shifted from a industrial-based economy to an information- and technology-based economy, conducting research for tomorrow's products and methods has increased in importance.

This Nation is the world's undisputed leader in technological innovation. American know-how has given the world benefits undreamed of a few years ago. Research and development activities by United States companies has led the way in delivering these benefits and has been a key factor in keeping us competitive with our ever-advancing trading partners.

In 1981, the Reagan Administration and Congress recognized the importance of research in our economy, and the R&E tax credit was enacted. Due to revenue concerns and uncertainty as to its effectiveness, the credit was enacted with a sunset date of December 31, 1985. Since then, the credit has been extended six times and modified four times. This year, Congress must again decide whether to extend the credit, modify it, or let it expire.

The R&E credit was designed to reward increased research expenditures over an amount the company would perform without an

incentive. Unfortunately, the credit has not perfectly achieved this difficult objective. The fact that the credit has always been temporary has probably resulted in lower utilization of the credit simply because an expiring credit cannot be counted on in long-run planning.

Research and development is, by nature, long-term. Also, some companies who have increased their research expenditures have been left out in the cold because of structural problems with the credit. Unlike a few years ago, it is now not always necessary for U.S. firms to perform their research within the boundaries of the United States.

As more nations have joined the United States in high-tech manufacturing centers, with educated work forces, multi-national companies have found that moving manufacturing functions overseas is sometimes necessary to stay competitive.

The same is often true with basic research activities. In fact, some of our major trading partners now provide generous tax incentives for research and development conducted in those nations. Therefore, we are at risk of having some of the R&D spending in the U.S. transferred overseas if we do not keep competitive.

My home State of Utah is the home of a large number of innovative companies who invest a high percentage of their revenue in research activities. For example, between Salt Lake City and Provo lies the world's biggest stretch of software and computer engineering firms. This area, which was named Software Valley by Business Week is second only to California's Silicon Valley as a thriving high-technology commercial area.

In addition, the Salt Lake area is home to at least 145 biomedical firms that employ nearly 8,000 workers. These companies were conceived in research and will not survive, much less grow, without continuously conducting R&D activities.

In all, there are approximately 80,000 employees working in Utah's 1,400 plus and growing technology-based companies. Research is the life blood of these firms and of hundreds of thousands more of them throughout the Nation that are just exactly like them.

It seems to me that a permanent and effective tax incentive to maintain and increase research is essential to the long-term health of all of these businesses. It should really go without saying that cutting edge research and technology is essential to the long-term health of our entire economic future.

I want to thank all of our witnesses for their efforts in being here today, and I look forward to hearing their ideas as to how we can best assist American companies with their vital research activities. I will note that the Treasury Department was invited to testify today, but declined. We have, however, received a written statement which we will make part of the hearing record.

[A statement by the Assistant Secretary for Tax Policy appears in the appendix.]

We will now turn to our first panel, which consists of Dr. Natwar M. Gandhi, who is Associate Director of Tax Policy and Administration with the General Accounting Office; Mr. Linden C. Smith, managing director of Barents Group, a subsidiary of KPMG Peat

Marwick; and Dr. Martin A. Sullivan, an economic consultant and adjunct scholar at the American Enterprise Institute.

We welcome all of you here today. We will begin with you, Professor Gandhi.

STATEMENT OF NATWAR M. GANDHI, PH.D., ASSOCIATE DIRECTOR OF TAX POLICY AND ADMINISTRATION, GENERAL ACCOUNTING OFFICE, WASHINGTON, DC

Dr. GANDHI. Thank you, Mr. Chairman. Mr. Chairman, we are pleased to be here today to discuss several issues we believe are important to your considerations of the research tax credit.

As you know, Congress created the credit in 1981 on a temporary basis 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. Currently, the rate of the credit is 20 percent of the spending. On the basis of our past work and newly available data, we have four major observations to make.

One. The research tax credit is primarily earned by large corporations in the manufacturing sector. For example, in the tax year 1992 corporations earned slightly over $1.5 billion of credits. Most of these credits were earned by large corporations in the manufacturing sector, as I mentioned, 74 percent by corporations with assets in excess of $250 million.

Within the manufacturing sector the four industries that earned the most credits were chemicals, including drugs, electronic and non-electronic machinery, and motor vehicles. 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 Joint Committee on Taxation has estimated that if the credit were extended, its annual revenue cost would be approximately $2.2 billion by fiscal year 1998. In an earlier study we estimated that, at the margin, the credit provided companies a benefit of 3-5 cents per dollar of additional research spending.

We further estimated that this incentive stimulated about $1-2.5 billion of additional research spending between 1981 and 1985, at a cost of $7 billion in tax revenues.

Thus, each dollar of taxes foregone stimulated between 15-36 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 be much higher.

Our second observation, is that the research credit is basically a transfer of money from all taxpayers to those taxpayers who exceed their base spending. This transfer is to induce changes in the productive activities within the economy.

It is commonly held that society benefits more from R&D spending than from non-research spending, but data to measure such benefits are very limited, making it difficult to determine conclusively whether the research tax credit provides a net benefit to society.

Now, the third observation. Congress, in 1989, revised the rules for calculating base and that should have increased the amount of research spending. Before 1989, the base was calculated in such a

way that a link was established between current spending and future base amounts. This link substantially reduced the credit that was available in the future years.

The 1989 revision broke the link and significantly increased the effective incentive of the credit. It also created a fixed base percentage as opposed to the moving average base that existed before.

However, over time the new base has the potential to become too generous for some taxpayers, resulting in undue revenue losses, and too restrictive for others, resulting in less overall research stimulated by the credit. If the credit is extended, Congress may want to provide for reviewing and adjusting this base as needed.

My last observation is that the research credit has been difficult for IRS to administer. This was based on a survey of IRS revenue agents who audited large companies for tax years 1981-1986. These agents questioned the credit claimed by 79 percent of the corporations in which the credit was audited, and that 54 percent of the agents found at least one aspect of the credit difficult to audit. About one-fifth of the agents say the definition of qualified research was unclear.

In 1994, the Department of the Treasury issued final regulations that may resolve these uncertainties. However, IRS and firms will still have to distinguish innovative research from routine research. That is because innovative research qualifies for the credit, routine research does not.

In conclusion, Mr. Chairman, given the lack of empirical data for evaluating the credit's net benefits to society, we have not taken a position as to whether the research credit should be made permanent or allowed to expire.

We have, however, concluded that if the Congress decides to extend the credit it may also want to ensure that the credit continues to provide an effective incentive to most recipients at an acceptable revenue cost. One way this could be done is by requiring that the base be reviewed periodically and adjusted as needed.

That concludes my oral statement, Mr. Chairman. I request that my written statement be placed in the record. I welcome any questions that you and other members may have. Thank you, sir.

Senator HATCH. Without objection. Thank you. We will put your full statement in the record. Thank you, Dr. Gandhi.

[The prepared statement of Dr. Gandhi appears in the appendix.]

Senator HATCH. We will turn to Mr. Smith.

STATEMENT OF LINDEN C. SMITH, MANAGING DIRECTOR, KPMG PEAT MARWICK LLP, WASHINGTON, DC

Mr. SMITH. Thank you, Mr. Chairman.

Research and development is critically important to the Nation's long-run growth. Advances in scientific and technical knowledge are important in explaining improvements in productivity. These advances lead to higher real wages and increased standards of living.

The most important step Congress can take in its review of the credit is to make the credit permanent. Perhaps the main reason the credit is not permanent already is the operation of the budget score keeping rules rather than concerns over the credit's effectiveness.

Short-run extensions have a relatively small cost, while a permanent extension may cost $8 billion or more over the next 5 years. But short-term extensions do not really save revenue, because the Congress has extended the credit six times since it was originally enacted in 1981; once for only 6 months, and twice retroactively.

Investors face uncertainty and do not fully respond to temporary incentives. This uncertainty imposes an economic cost. R&D planning has long lead times and it is not cost-effective for investors to change plans rapidly, and that uncertainty creates more risk. Increased risk causes investors to demand higher returns and, as a result, some R&D simply does not get done and the credit's effectiveness is reduced.

The principal justification for the credit is that the benefits of investments are not fully reflected in private rates of return to investors. This leads to under-investment. Social rates of return have been found to be, typically, twice the private rates of return.

In my written statement I show, in Table I on page three, a comparison of private rates of return to social rates of return, as studied by Bernstein and Nadiri. For example, in the chemical industry the private rate of return is about 13 percent, and the social rate of return is 29 percent. Some of the rates for other industries are much wider than that.

The differences between the private and public rates of return are called spill-over effects. Companies build on research performed by other companies, which tend to benefit society as a whole, but have the effect of reducing the return to the original investors.

Some examples might be in the computer and semiconductor industries. You can have a faster microprocessor developed by one firm, but that quickly leads to the development of similar products by other firms.

This is the result, in part, of normal competition, but also it is a result of the dissemination of new ideas and technology and we all benefit from these rapid improvements.

I am going to skip over some of the other charts and tables in my prepared testimony. But in Figure 2 on page five of my testimony I show some of the effects of the changes in domestic R&D. In the top chart it becomes apparent that what has happened is that U.S. R&D has been flat ever since basically the 1985-1986 period.

In the second chart on that same page, we compare the R&D, as a percentage of GDP, to Japan and Germany. We see that the U.S. is lagging well behind the growth rates in Japan and Germany. By 1991, Japanese spending is about three percent of their GDP, Germany is about 2.7 percent, but the U.S. is spending only 1.9 percent. Again, that has been quite flat in recent years.

Several recent studies have shown the credit to be quite effective in stimulating R&D growth. On average, the credit increases R&D spending by about a dollar of increased spending per dollar of credit in the short-run, and by as much as two dollars of increased spending per dollar of revenue loss in the long run.

The last time the credit was seriously debated was in 1989. A number of studies then found the credit was much less effective. The more recent findings paint a different picture. The credit is, in part, more effective as a result of the 1989 restructuring.

In addition to that, some of the more recent studies are technically stronger than some of the earlier studies. Beyond that, the lag times for R&D are quite long, and more recent studies have benefitted from the additional data.

In conclusion, the credit should be permanently extended. The recent studies have shown it to be effective, and, indeed, temporary extensions serve to make it less effective than it otherwise would be. The past short-term extensions have not saved revenue, and the Congress has continued to extend it, in any event.

But, on the other hand, because investors do not know for certain what the Congress will do, they tend to require higher rates of return on R&D spending, leading to under-investment.

Finally, a permanent investment of the credit is an important step that the Congress can take to encourage additional R&D investment, to increase productivity, and to lead ultimately to higher wages.

Thank you, Mr. Chairman.

Senator HATCH. Thank you, Mr. Smith.

[The prepared statement of Mr. Smith appears in the appendix.]

Senator HATCH. Dr. Sullivan, we will turn to you.

STATEMENT OF MARTIN A. SULLIVAN, PH.D., ECONOMIC CONSULTANT AND ADJUNCT SCHOLAR, AMERICAN ENTERPRISE INSTITUTE, WASHINGTON, DC

Dr. SULLIVAN. Thank you, Mr. Chairman, and good morning.

My name is Martin Sullivan. I am a self-employed economist and an adjunct scholar at the American Enterprise Institute. It is an honor to be here today, and I hope my views will be helpful to you.

Before addressing the question of what type of R&E credit would be best I would like to, first, address the larger question of whether or not there should be an R&E credit.

There are at least three good reasons to extend the R&E credit. First, research is critical to competitiveness and economic growth. Second, research is an exception to the general economic rule that the free market works. The free market will not sufficiently invest in R&E. This is one of the few cases where government intervention is justified.

Third, the current credit is extremely well-designed to squeeze the maximum increase in research out of the smallest amount of revenue cost. But good intentions do not guarantee results. The importance of R&E and the efficient design of the R&E credit do not necessarily mean that the credit will actually increase R&E.

To properly evaluate the R&E credit we would like to know if businesses alter their research plans in the presence of a tax credit. Unfortunately, economic evidence on this point is mixed and it is inconclusive.

Even if the credit increases research it may, at the same time, be draining investment funds from other important uses such as investment in plants and equipment. Because total investment in the economy must be equal to total saving, any additional research induced by the credit is likely to crowd out other types of investment.

The incremental R&E tax credit provides 20 cents of tax reduction for each dollar of R&E spending in excess of a base amount.

Each firm's base amount is average spending on research over the 1984-1988 period, indexed to the firm's own growth in sales. In essence, a firm is rewarded for increasing research spending over the amounts its spent in the mid-1980's, with an adjustment to take into account the firm's size.

As far as pure economic incentive is concerned, the current incremental R&E credit is about as well-designed and cost-effective as any credit practically can be. Unlike a flat credit, the current credit does not provide incentives for doing R&E, it provides incentives for increasing R&E.

For example, suppose a firm has annual growth in sales and research of 7 percent. Under current law, this firm would receive 20 cents of tax subsidy for each additional dollar of R&E. Under a flat credit of equal revenue cost, the firm would receive approximately three cents of tax subsidy for each additional dollar of R&E.

If all firms' research grew in tandem with their sales, there is no question that the current law incremental credit would be preferable to a flat credit. But, in reality, many firms have gone through a great deal since the mid-1980's. Some firms have entered new lines of business, while others have shed lines of business.

Some firms have evolved from fledgling start-up to market leaders. Still others have significantly reduced their research since the mid-1980's simply because research spending during that period was extraordinarily high.

Because of these types of changes, many firms are effectively blocked from ever receiving a R&E tax credit. Even after taking into account that many firms receive no incentive under current law, a revenue-neutral flat credit is still far less effective than current law. I estimate that the revenue-neutral flat credit provides between one-third and one-fifth of the economic incentive effect of the credit as it is currently structured.

But pure economics cannot be the sole factor guiding our decisions. There is much in the current structure that may be perceived as unfair. Take the example of two firms that both spend $50 million on research in 1995. One firm might receive $5 million in tax credits, while a second firm receives absolutely nothing. This enormous difference for two firms that otherwise may be identical is entirely attributable to the difference in their activities during the years 1984 to 1988.

In addition, the current credit can result in a serious misallocation of research dollars. Under a flat credit, the incentive effect may be small, but at least it is even. Under current law, a flat credit does not distort the allocation of resources across industries and does not result in unfair competition within industries.

Moreover, it is likely that over time more firms will become ineligible for the credit. Thus, the passage of time will reduce the aggregate effectiveness of the credit, as well as increase the distortion in the allocation of research dollars across industries.

With regard to the R&E tax credit, the two options most discussed are extending the current incremental structure and replacing the incremental structure with a flat credit. In my judgment, neither option will be particularly attractive over the long term.

As noted before, the current credit is extremely cost-effective. However, the extension of the credit would result in a wide dispar-

ity of tax benefits and tax incentives received by different firms. This is unfair and it is inefficient. It is likely that these negative features will become increasingly prominent over time.

The second most frequently discussed option is a flat credit. This type of credit is simple, provides uniform incentive, and distributes tax benefits in proportion to research spending, but its low incentive effects leaves it vulnerable to criticism.

I will hazard a guess that a compromise between extension of current law and a flat credit would be superior to either option individually. Under such a compromise the incremental rate would have to be reduced below 20 percent—perhaps to 16 or to 12 percent—and a flat credit of approximately 2 percent would be allowed as an option.

Under this credit all firms will receive some credit and incentive effects would be significantly less than current law or significantly more than under a flat credit. Economic distortions would exist, but they would be less than under current law because all firms would receive at least some credit.

This credit is not perfect, but it is probably the best that could be done. If the credit cannot be made permanent its incentive effects are diminished and the arguments in favor of extension are also diminished. In this case, allowing the credit to expire, pocketing the $2 billion of revenue savings, and using the savings for deficit reduction, should be given serious consideration.

This concludes my oral testimony. I am very grateful to this subcommittee for this opportunity to share my views.

Senator HATCH. Well, thank you. We are grateful to all three of you for coming.

[The prepared statement of Dr. Sullivan appears in the appendix.]

Senator HATCH. Dr. Gandhi, it seems difficult or impossible to design a research credit that only rewards companies for undertaking research that they would not have undertaken in the absence of the credit.

It also seems clear that our current research credit does not properly reward certain companies for their research, I think because of the way the base period is constructed.

Do you believe that the research credit should be better designed to more fully achieve its goals?

Dr. GANDHI. Yes, sir. I think what we want to keep in mind is that, as long as it is incremental and as long as the Congress would like to extend the credit, every so often we should go back and make sure that the base is properly designed. Currently the credit does not really provide incentive to do research that would not have been done independent of credit. We want to make sure that we stimulate research that would not have take place.

Senator HATCH. Can we determine the actual amount, or what amount of an actual R&D investment can be directly attributable to the existence of the R&D credit?

Dr. GANDHI. Well, in our study of the earlier credit we determined that, depending upon how the taxpayers react to the stimulating effect of the credit, it was somewhere between 15-36 cents for every dollar that they would receive in terms of credit.

Senator HATCH. The R&E tax credit was originally enacted in 1981. Then in 1986, and again in 1989, it was significantly modified. Could you comment on the problems that arose from the 1986 and 1989 modifications?

Dr. GANDHI. I think there are two considerations. One consideration is that the base, as included the moving average, really created a lot of problems and it really lost its stimulative effect.

In terms of the 1986 changes, by limiting the credit and making sure that some of the expense deduction is limited, it is difficult for us to identify how much spending is stimulated by the credit itself. Putting it together with the general business credit also makes it difficult for us to really delineate what exactly is the stimulative effect of the credit itself.

Senator HATCH. All right. Thank you.

Mr. Smith, since 1981 the Research and Experimentation Tax Credit has been extended six times, from periods ranging from 5 years to 6 months. Is there any way to place a dollar value on the amount of research that has not been spent because of the uncertainty of a research credit with an expiration date?

Mr. SMITH. That is a very difficult thing to measure. Some of the most recent research done by an economist named Bronwyn Hall has shown that the credit in the long run, if made permanent, could approximately double the effect of the revenue loss. But there really is, as Dr. Gandhi has stated, not enough evidence to really say much with a great deal of certainty.

Senator HATCH. Well, you mentioned in your testimony that Congress has always temporarily extended the credit because of revenue concerns, yet no revenue is actually saved by only making the credit temporary instead of permanent. Could you elaborate a little bit on that point?

Mr. SMITH. Yes. The problem that we face is, some companies are uncertain about what will happen with the credit and they do not always take into account the fact that it will be made permanent. We know of one company in particular that always bases its R&D plans on current law. And under current law, as you know, the credit expires after June 30.

So, they are basing their R&D plans upon the availability of no credit in future years. It is a conservative way of doing business planning, but, nevertheless, they feel that is all they can count on right now.

The net result of that is, if Congress again extends the credit, to a degree they're getting a windfall gain. That is, they're not performing more research as a result of the availability of the credit. Rather, they are getting a credit for the incremental research they might be performing in any event. So the credit, by itself, can be made more effective if, in fact, it is permanent because companies will then have to take it into account fully in their research plans.

Senator HATCH. Well, in your view would there be a permanent decrease in the amount of R&D carried on by private business in the country if there were no R&E credit?

Mr. SMITH. Yes, I think there would be some decrease relative to what would otherwise happen.

Senator HATCH. Some of our major trading partners have more generous R&D credits than the U.S. credit. How does the structure

of their tax credits differ from ours, and are there positive aspects of their credits that we could incorporate into our tax credit?

Mr. SMITH. Some of the credits are similar to ours in that they are incremental and they cover the same basic types of expenses.

We do not have the most recent data on Germany, but we do know that for a period of time they had a direct grant system rather than a tax credit system and the net effect of that grant system was essentially equivalent to a refundable credit, as it was a grant that companies received of a fixed dollar amount, purely for investments in R&D.

So, you did not face some of the limitations that U.S. companies face as a result of general business credit limitations and limitations that result from the alterative minimum tax, and simply firms having losses and not being able to use the credit currently.

Senator HATCH. Do you like that better than ours?

Mr. SMITH. There are certainly revenue costs that are associated with any liberalization in the credits of that regard. There are also issues that certainly came up prior to the 1986 Act with the possibility that some firms could zero out on their tax liability as a result of claiming credit, so there is always a tension there. But purely from the standpoint of increasing R&D, a refundable credit would probably be the most effective way of doing it.

Senator HATCH. You mentioned in your testimony both private rates of return and social rates of return in connection with the benefits of R&D. Could you explain the differences between private and social rates of return?

Mr. SMITH. This goes back to the issue of spill-over effects. When a private company engages in research and develops a product, other competitors will see that product, the marketplace will see it, and they will copy some of the features, they will take advantage of the break-throughs that have occurred.

A company simply cannot control all the spin-off effects of a basic new idea, and that new idea will result in other firms getting a rate of return based on the first company's research.

Beyond that, society as a whole will benefit as a result of both lower cost for new products and better capabilities, increased functionality, more productivity, lower costs. There are a variety of ways in which these spill-over effects occur.

Senator HATCH. You make a strong case as to why the research credit should be made permanent. Do you have any views on whether the credit should be structurally changed or simply made permanent in its current form?

Mr. SMITH. There are certainly problems with its current form. There are companies who are increasing their R&D spending who are not eligible for the credit and, arguably, should be eligible for the credit.

Any restructuring of the credit is going to involve some winners and some losers. That is, to the extent it is done on a revenue-neutral basis, as Dr. Sullivan has suggested, there will be winners and losers.

I think the most important thing that Congress can do is to, in fact, make it permanent. But, on the other hand, I would not preclude any review of the current structure.

Senator HATCH. All right.

Dr. Sullivan, in your view, is a dollar spent by the Federal Government in the form of a tax credit for research through the private sector better than a dollar spent on direct government research?

Dr. SULLIVAN. When it is spent in the private sector, do you mean in the form of a tax credit?

Senator HATCH. Tax credit, right.

Dr. SULLIVAN. I think that, generally, we favor the private sector to allocate resources better than the government because they are just better at it. But there is another issue as to what the order of magnitude of the effect of this credit is. Given that uncertainty, it is hard for me to make an evaluation of that statement with any type of precision.

Senator HATCH. All right. One of the biggest problems with the currently structured research credit is that it does not provide any incentive for companies to increase their R&D spending because of base year problems, and so on.

Do you believe that there is a way, such as through the optional flat credit idea, that the research credit could be enhanced to include those companies without reducing its effectiveness for companies who are benefitting already from the current credit?

Dr. SULLIVAN. Well, I would just like to modify your paraphrase of my statement.

Senator HATCH. Sure.

Dr. SULLIVAN. As Mr. Smith said, there would be winners and losers. The suggestion—I emphasize it is just a suggestion—that I made would take tax benefits away from the fast-growing companies and redistribute them to the slower growing companies. So, there would be some losers, and those firms who were losing benefits under this proposal would have less incentives.

The proposal that I suggested would be a compromise. It is not a wonderful proposal, but I think it tries to ameliorate the problems with either extreme of just having one single flat credit or just maintaining current law. So there would be a diminution of incentive effects under my proposal.

Senator HATCH. Well, given your role in improving the formula for calculating the research credit in 1989, do you believe that the tax credit is now working better than ever?

Dr. SULLIVAN. No, I do not. I believe that the credit, in terms of pure economic effects, is a wonderful credit. But more and more firms'—and this was anticipated in 1989—base period amounts become less relevant to their current experience, so these firms literally fall off a cliff and, over time, they are absolutely unable to receive a credit. This is not attractive, from an economic point of view, that some firms receive a large incentive and others do not.

Senator HATCH. Well, we are interested in all three of your viewpoints and would appreciate any help you can give the committee as to which way we should really go. You have been very helpful here today. We appreciate all three of you coming to testify.

Dr. SULLIVAN. Thank you.

Senator HATCH. Thank you so much.

Dr. GANDHI. Thank you, sir.

Senator HATCH. All right. We would now like our second panel to now come forward. This panel consists of Mr. Paul Cherecwich, who is vice president of tax and tax counsel for Thiokol Corpora-

tion, and who is testifying on behalf of the Aerospace Industries Association.

Second, we have Mr. Marty Glick, vice president and treasurer of Genentech, testifying on behalf of the R&D Credit/Section 861 Coalition.

Next, we have Mr. Robert Gregg, senior vice president of finance and legal, treasurer and chief financial officer of Sequent Computer Systems, testifying on behalf of the American Electronics Association.

Finally, we have Mr. Cliff Simpson, vice president of tax, export and audit of Novell, Inc., testifying on behalf of the Working Group on Research and Development.

So, we welcome all of you here. We will begin with Mr. Cherecwich, first. Happy to have you here. Good to see you, Paul.

STATEMENT OF PAUL CHERECWICH, JR., VICE PRESIDENT, TAX AND TAX COUNSEL, THIOKOL CORPORATION, OGDEN, UT, TESTIFYING ON BEHALF OF THE AEROSPACE INDUSTRIES ASSOCIATION

Mr. CHERECWICH. Thank you, Senator. I appreciate the opportunity to speak with you this morning. My name is Paul Cherecwich, and I am the vice president of tax and tax counsel for Thiokol Corporation, a Utah-based multi-national, with business operations in space, defense, and fastening systems industries. I am here today representing the Aerospace Industries Association of America as Chair of its tax matters committee.

AIA is a non-profit trade association representing the Nation's manufacturers of commercial, military, and business aircraft, helicopters, aircraft engines, missiles, spacecraft, and related components and equipment. With a membership of more than 50 of the Nation's largest manufacturers, AIA represents every significant employer in this industry.

The forces of international competition and the end of the Cold War are continuing to converge on the U.S. aerospace industry. Its members have been and continue to downsize. In 1994, U.S. aerospace sales fell nine percent, investment in new plant and equipment fell 8.4 percent, employment fell 7.8 percent, and the industry's trade surplus fell 5.5 percent.

In spite of this decline in business fortunes, the aerospace industry still maintains an important segment of the U.S. economy, providing 836,000 U.S. jobs and $3.85 billion of exports last year. Research and development is the lifeblood of the continued success of the aerospace industry, and that is what we want to address today.

We have heard from the earlier panel how the tax credit works. The one point that they did not emphasize adequately, in my view, is that when calculating the current year's ratio of R&D expenditures to sales, the sales figure that must be used is the average annual gross receipts for the preceding 4 years. So we have a base period limitation that is based upon the 1984-1988 ratio, but applied to the average of the last 4 years' sales.

Most aerospace companies are denied this credit because of the limitation, and it works against the industry in several ways. First, as the industry downsizes, R&D, as a percentage of current year sales, tend to be static or declining.

Second, as industry merges occur, multiple R&D programs are being combined and economies of scale are reducing total dollars expended. I note that this morning's newspaper indicated that Raytheon and E-Systems are combining; the trend is continuing.

Third, as the industry re-engineers itself and becomes more efficient and competitive, it also is conducting R&D in a more cost-effective manner.

Finally, as sales decline, the statutory formula for computing the ratio of current year expenditure to sales is very punitive. I would like to discuss that fourth point in more detail.

In the text of my submitted testimony is a chart showing what happens to a business that grows for four years and then suffers the 9 percent annual decline in sales that the aerospace industry is facing.

This business maintains its research as a constant percentage of annual sales. In the fifth year, when the sales of this company are declining and it reduces its R&D expenditures in terms of absolute dollars, we note that, the way the formula works, that company still gets a credit. So, it gets a credit even though its research dollars have gone down. Then when we get into year six and later there is absolutely no credit at all.

Right at the very moment when this business could use some encouragement to keep its R&D going, tax policy offers no encouragement to continue or maintain its level of its spending. The present credit is flawed in this regard.

No less a body than the Congressional Research Service, in its report on the research credit dated August 11, 1994, said, with respect to the dampening effects of the current design, "There is little in economic theory to support this." The Congressional Research Service report also goes on to say, "Research by firms whose outlays are shrinking is, in principal, just as valuable as research by expanding firms."

Our solution to this dilemma is to modify the credit to provide some incentive to aerospace and other firms that conduct important research but that cannot maintain the level of expenditures necessary to obtain benefits under the current incremental credit.

By doing so we would help those firms most in need of help and would discourage them from moving their R&D activity offshore in search of the credits that at least 16 other countries provide.

In calling for a change to the credit we recognize there are a few companies for whom the present law, incremental credit, works exactly as intended. These companies, including a few AA members, have growing sales and growing levels of R&D expenditures, and, therefore, we are suggesting that these companies not be penalized by any changes to the existing credit.

To accomplish the goals outlined in this paper we have a suggestion that is very similar to that of Dr. Sullivan. We propose that taxpayers should be permitted to elect a change from the current 20 percent incremental approach to a 5 percent credit on all qualified R&D expenditures once every 5 years, with the election, once made, binding for all future years.

AIA members believe that a 5 percent credit is a appropriate number to effectively modify behavior. It is interesting to note that an analysis of data obtained from the Statistics of Income Division

of the IRS shows that, in 1991, total research credits claimed were 4.1 percent of qualified expenditures, and for 1992, were 3.6 percent of qualified expenditures. This would seem to indicate that, in the aggregate, our proposal is not out of line.

We thank you for the opportunity to appear before you today and would appreciate your support for our industry. We welcome your support for this initiative. Thank you.

Senator HATCH. Well, thank you.

[The prepared statement of Mr. Cherecwich appears in the appendix.]

Senator HATCH. Mr. Glick, we will go to you.

STATEMENT OF MARTY GLICK, VICE PRESIDENT AND TREASURER, GENENTECH, INC., SOUTH SAN FRANCISCO, CA, TESTIFYING ON BEHALF OF THE R&D CREDIT/SECTION 861 COALITION

Mr. GLICK. Thank you. Mr. Chairman and members of the Finance Committee, my name is Marty Glick. I am vice president and treasurer of Genentech, a California-based leading biotechnology company that develops, manufactures, and markets human pharmaceuticals. I am testifying today on behalf of the R&D Credit/Section 861 Coalition, representing more than 5,000 companies.

There are three powerful reasons why the R&D credit should be made permanent. One, it is a critical investment by the government in the long-term strength of the U.S. economy. It will have a strong, positive impact in economic growth, productivity, and jobs; two, it will ensure our country remains economically competitive in the global marketplace; three, by stimulating corporate R&D, it would result in significantly higher returns and efficiencies than comparable government spending on civilian R&D projects.

I would like to discuss each of these in more detail. First, why will the R&D credit spur economic growth, productivity, and jobs? The tax credit is vitally important to the 5,000 research-intensive companies I represent today.

For example, Genentech invests over 40 percent of its revenues—that is not profits, that is revenues—in research; 10 times the national average. Our research intensity is necessary because it requires 10-12 years of R&D investment just to commercialize one product, and new products are essential to our success.

Genentech is one of the most research-intensive companies in the world. We invest an astonishing $120,000 in R&D for each employee. That is about 30 times the national average. Since our company was founded in 1976, our R&D investments have created 10 of the 25 genetically-engineered drugs now on the market. These drugs help to prevent and treat such diseases as diabetes, hepatitis, heart attacks, cystic fibrosis, and leukemia. The R&D credit is an important part of this history.

Next, I would like to discuss why the R&D credit will help ensure U.S. industry remains internationally competitive. Although the U.S. still leads the world in total dollars spent on R&D, we have fallen behind both Japan and Germany in terms of non-defense R&D spending as a percentage of the Gross Domestic Product.

This is an alarming trend, because numerous economic studies have concluded that R&D intensity is closely associated with economic growth. It is no coincidence that, in the 20 years between 1970 and 1991, Japan had the fastest growth rates in the world in both R&D spending and Gross Domestic Product.

The United States' poor performance is highlighted by the fact that various foreign countries are all at higher real R&D and gross domestic product growth than the United States.

I know from personal experience that foreign countries offer significant capital incentives to invest in their countries. If we are to maintain a global competitiveness we must not let the few incentives we have, like the R&D credit, lapse.

Finally, I want to discuss why an R&D tax credit for the government is a better investment than government spending on civilian R&D. Mr. Chairman, a permanent R&D credit will lead to an increase in productivity that will contribute to rising wages and standard of living. Taxpayers will benefit, both as consumers and as workers. The return from direct government spending has been shown to be extremely low.

On the other hand, researchers have found that the rate of return of corporate R&D is as much as 25 percent. As it was pointed out earlier, even more importantly, these studies show that the total return from corporate R&D can be as high as 56 percent when indirect benefits are counted.

As Mr. Smith noted, the indirect benefits from R&D are significant. A development in one industry can revolutionize the production process in many industries. A cost-reducing innovation in one company can be copied by competitors, driving down prices. A new drug for diseases like cystic fibrosis can significantly improve patients' quality of life.

This is not a time for the government to reduce incentives for R&D. The biotech industry and other industries in our coalition are at a critical juncture in history. Firm action is needed to maximize their R&D investment and remain internationally competitive.

At a time when we are all eager to ensure that government spending is productive, the R&D credit is an outstanding example of the cost-effective use of tax dollars.

In closing, Mr. Chairman, on behalf of the 5,000 companies in our coalition, we strongly urge the tax credit to be made permanent. We strongly believe that it is important that Congress make a statement now that U.S. R&D is important, that credits should be made permanent.

Thank you.

Senator HATCH. Thank you. We appreciate it.

[The prepared statement of Mr. Glick appears in the appendix.]

Senator HATCH. Mr. Gregg, we will go to you, now.

STATEMENT OF ROBERT S. GREGG, SENIOR VICE PRESIDENT OF FINANCE AND LEGAL, TREASURER AND CHIEF FINANCIAL OFFICER, SEQUENT COMPUTER SYSTEMS, INC., BEAVERTON, OR, TESTIFYING ON BEHALF OF THE AMERICAN ELECTRONICS ASSOCIATION

Mr. GREGG. Thank you, Mr. Chairman. Mr. Chairman and members of the subcommittee, my name is Bob Gregg. I am the senior

vice president of Finance and Legal for Sequent Computer Systems.

Sequent is based in Beaverton, Oregon, is a leading architect of Enterprise Information Technology Solutions. In 1994, Sequent had approximately 1,800 employees worldwide, with approximately half of our total revenue coming from sales outside the U.S. from production of products within the U.S.

I am testifying today on behalf of the America Electronics Association, AEA, an organization that represents some 3,000 U.S. technology companies based in 44 States, and which contribute to over 2 million jobs in the United States. More than 70 percent of AEA members employ less than 200 people.

AEA's companies, which range from small start-ups to the Fortune 500, span the breadth of the electronics industry and have made making the R&D credit permanent a top priority for AEA.

I want to thank this subcommittee for providing me the opportunity to testify today regarding the importance to the U.S. high-technology industry of a permanent R&D credit.

As an Oregon-based company, I would also like to express special thanks to Senator Packwood for his long-time support of the R&D credit, as well as his efforts in trying to address a technical glitch in the R&D credit definition of start-up companies.

This glitch severely impacts Sequent and has resulted in our receiving no credit since the credit structure was changed in 1989, even though our research expenditures have increased over 700 percent and, since the inception of the company, it has contributed to the employment of 300 skilled engineers in Oregon and over 600 technically skilled support personnel.

Sequent was founded in 1983 by 18 former Intel employees with a vision of the future and the innovative spirit that the R&D credit was designed to encourage. As a result of our successful R&D efforts in the middle 1980's, Sequent has grown from a small start-up company just over 10 years ago to the mid-sized company that it is today. Our success is largely due to the research and development undertaken by Sequent to design and manufacture a new generation of large commercial computer systems.

Before the structure of the credit was changed in 1989 and the start-up definition was written in such a way as to exclude certain start-up companies, the R&D credit was very important to Sequent and, I believe, worked as a strong incentive to get Sequent to spend more on R&D.

I would like to address two topics in my testimony today. First, making the R&D credit permanent is a top priority for AEA. I will address the reasons why we believe strongly that a permanent R&D credit would be an important public policy tool that would result in keeping good paying, high skilled jobs in the U.S.

Second, I would like to address the need for a technical correction of the glitch that we call the notch baby issue that impacts Sequent and other companies. With this correction, Sequent also believes the R&D credit should be made permanent.

Research and development leads to advances in scientific and technical knowledge, productivity improvements, and long-term economic growth. Without an outside stimulus such as that pro-

vided by the R&D tax credit, private companies will under-invest in R&D.

A permanent R&D credit will generate even more investment in R&D than that generated by temporary extensions because corporations will be able to rely on the continued availability of the credit, making the long-term R&D investment decisions.

Moreover, R&D credit promotes a range of highly-skilled, high-paying U.S. jobs. For all these reasons, the AEA strongly advocates a permanent extension of the R&D credit.

I will now address the technical glitch that needs to be corrected so that start-up companies like Sequent can utilize the credit. Under the current credit, only qualified research expenses over a fixed base amount are eligible for the credit.

In 1989, the base calculation was changed. Recognizing that companies in the start-up phase will experience a distorted relationship between research expenses and gross receipts in their initial years of operation, Congress provided a special fixed base for start-up companies.

Specifically, under those rules a start-up company is defined as any company with fewer than 3 years of both gross receipts and qualified research expenses during the base period, 1984 through 1988.

The problem with the three- out of 5-year test is that it necessarily misses any company that began in 1984, 1985, or 1986 of the base period, as contrasted with those starting in later years, even though these early base period starters would have had R&D to sales ratios well beyond 100 percent during many of the base years. We understand from those involved in putting the provision together in 1989 that this result was never intended.

Sequent is a perfect example of the unfairness enacted by this role. Sequent incurred its first year of research costs in 1983 and its first year of gross receipts in 1984. As a result, our fixed-base percentage is so high that all of the foreseeable future we will not receive any R&D credit, yet our history and our R&D-to-sales ratio show that we clearly are in a start-up phase and, thus, were the type of company Congress intended to include in the future credit eligibility.

Without this change, the credit's incentive value for companies like Sequent is zero. Without an R&D credit, Sequent will be at a distinct disadvantage against our competitors due to our misfortune of having our first year of both sales and R&D fall in 1984 rather than in 1987 or beyond.

The proposal that solves this problem is very simple. It would change the definition of a start-up company to include any company with its first year of both R&D and sales in 1984 or thereafter.

Based on a revenue estimate given on the proposal included in H.R. 11 in 1992, a bill vetoed by President Bush for reasons unrelated to this issue, the cost over 5 years would have been under $50 million. We would expect the cost to be similar today.

On behalf of the AEA, as well as Sequent, I hope you will seriously consider both making the credit permanent, and fixing this problem, whether through a technical correction or R&D credit legislation.

I would be happy to answer any questions.

Senator HATCH. Thank you, Mr. Gregg.

[The prepared statement of Mr. Gregg appears in the appendix.]

Senator HATCH. Mr. Simpson, we will turn to you, now.

STATEMENT OF CLIFF SIMPSON, VICE PRESIDENT, TAX EXPORT AND AUDIT, NOVELL, INC., SALT LAKE CITY, UT, TESTIFYING ON BEHALF OF THE WORKING GROUP ON RESEARCH AND DEVELOPMENT

Mr. SIMPSON. Thank you, Mr. Chairman. As vice president of Tax, Export and Internal Audit for Novell, Inc., I oversee the company's activities related to all matters of taxation, export policy, and internal audit.

I thank you, Mr. Chairman, for the opportunity to testify today before your subcommittee on the importance of making permanent the research and development tax credit.

I commend you also, Mr. Chairman, for holding these hearings. I also commend your leadership, along with that of Senator Baucus, in introducing Senate bill S. 351 to permanently extend the credit.

I am testifying today on behalf of the Working Group on Research and Development, a broad-based coalition of companies from a variety of industries jointly seeking the permanent extension of the R&D tax credit.

I am also appearing in my capacity of vice president of Tax for Novell, Inc. Novell, Inc. is an operating systems software company and an industry leader in providing network services and application software. Our growth has taken us from 14 employees in 1983 to almost 8,000 currently.

Approximately 35 percent of the total number of our employees are directly involved in research and development efforts. For that reason, I believe I have seen firsthand the benefits of the R&D tax credit on job growth and increased productivity.

According to the Tax Reform Act of 1986, the R&D credit was originally limited to a 5-year term in order to enable Congress to evaluate the operation of the credit. While it is understandable that the Congress would want to initially adopt a credit on a trial basis, the credit has proven to be effective and such a stance is no longer necessary.

A recent study on the R&D credit, entitled the R&D Credit: The Importance of Permanence, conducted by the Policy Economics Group of KPMG Peat Marwick, concludes that "a tax credit for research and experimentation was enacted with the goal of offsetting the tendency to under-invest in industrial research. The R&D tax credit has been a cost-effective tool for stimulating private R&D activity."

We believe that the R&D credit has played a significant role in placing American business ahead of their international competition and in developing new markets and product as well as stimulating private sector R&D activity.

Foreign governments are competing intensely for U.S. research investments by offering tax and other financial incentives. We can no longer assume that American companies will automatically choose to site their R&D function in the U.S. Congress and the ad-

ministration must make a strong and permanent commitment to retaining R&D investment in the United States. The best way to do this is by permanently extending the existing R&D tax credit.

The KPMG Peat Marwick study that I cited concluded that a one dollar reduction in the after-tax price of R&D stimulates approximately one dollar of additional private R&D spending in the short-run, and about two dollars of additional R&D in the long-run.

The study states, "The credit has been a public policy success. The best available evidence now indicates that the increase in R&D due to the tax credit equals or exceeds the credit's revenue costs."

But, after all, what we are talking about is an investment in jobs and in people. Investment in R&D is ultimately an investment in people, their education, their jobs, their economic security, and their standard of living.

My experience has been that more than 75 percent of expenses qualifying for the R&D tax credit go to salaries—high-paid salaries—for researchers and technicians for example, providing high-skilled, high-wage jobs to U.S. workers. Investment in R&D and investment in people is one of the most effective strategies for economic growth and competitive vitality.

Research projects cannot be turned off and on like a light switch. If corporate managers are going to take the benefits of the R&D credit into account in planning future research projects they need to know that the credit will be there when the research is performed.

In order to increase their R&D efforts, businesses must search for, and hire, scientists, engineers, and support staff. They must often invest in new equipment. If the credit is to provide an effective incentive for increased R&D activity, the practice of periodically extending the credit for short periods must be eliminated and the credit must be made permanent.

Making the existing R&D credit permanent best serves the country's long-term economic interests, as it will eliminate the uncertainty over the credit's future and allow R&D performing businesses to make important long-term business decisions regarding research spending and investment.

By creating an environment favorable to private sector R&D investment, jobs will remain in the United States. Investment in R&D is an investment in people. A permanent R&D credit is essential for the United States' economy in order for its industries to compete globally.

You have heard today from other witnesses about certain ways in which the current R&D credit can be improved and expanded. While such enhancements may warrant attention, the current R&D credit has withstood the test of time and has been subject to significant legislative and private sector scrutiny and evaluation.

Studies have confirmed its cost effectiveness and its ability to create incentives. I sincerely hope that any discussions for improvement will not delay immediate action on permanently extending the existing credit.

The most important thing Congress can do is to provide an environment that encourages U.S. technological advancement and leadership by finally making permanent the existing R&D tax credit. It is an example of a good program that is working.

Thank you again, Mr. Chairman, for the opportunity to offer my testimony today. Of course, I would be happy to answer any questions.

Senator HATCH. Well, thank you so much, Mr. Simpson. we appreciate having you here today.

[The prepared statement of Mr. Simpson appears in the appendix.]

Senator HATCH. Let me start with you, Mr. Cherecwich. You mentioned that downsizing in the aerospace industry has resulted in R&D spending declining as a percentage of sales. Why is that?

Mr. CHERECWICH. We are under a lot of pressure to maintain at least some degree of stable earnings, even though the industry is declining and sales are declining. We are having to cut expenses everywhere.

We also are doing re-engineering activity, as I indicated, and are trying to figure out how to do things more efficiently so that the absolute amount of R&D dollars being expended is getting lower as well.

I also do not think that we should overlook the problems associated with merging two large companies. There are always duplicate programs going on, at least one might assume that people are pursuing similar activities. And, as they are getting the benefits of consolidating their companies, they wind up reducing any surplus R&D.

There is no sense in having somebody on the east coast and somebody on the west coast working on the same thing. If you merge an east coast and a west coast company you are going to wind up one place or the other performing that research. The result is, the absolute dollar value of research is going down.

On the other hand, I do quote the Congressional Research Service, where they say, "Research by firms whose outlays are shrinking is, in principal, just as valuable as research by expanding firms."

Senator HATCH. That is interesting. Does the fact that the structure of the research credit is based on the percentage of R&D to sales as opposed to simple absolute dollars of R&D spending not protect companies whose revenue is declining so long as the percentage to sales increases?

Mr. CHERECWICH. If the percentage of research-to-sales increases, yes, that would protect them. But I know that the way current credit works, you can have a decline in absolute dollars of research money spent from year one to year two and still get a credit.

If you were to look at my example attached to my formal testimony, I show that in year five the absolute amount of research dollars being spent went down, and yet that company still gets a credit. The structure of the credit is not achieving the kind of incentive that the drafters thought it was going to achieve when it rewards somebody for decreasing levels of expenditures.

I also note that it is very difficult, given the way we have this overlap of the 1984 to 1988 base period percentage with this averaging system of the prior years sales, to sit down with the head of our R&D department and talk about the kind of benefit that he can take into account.

I simply cannot do it the way the current credit is structured. The best I could tell him in the past few years has been, well, maybe we will get a credit, maybe we will not; it all depends on how these numbers ultimately fall out. So, the planning aspect of it just does not seem to be there.

Senator HATCH. Well, as I understand it, your proposal would give companies an opportunity every five years to elect to change from the current incremental credit to a flat 5 percent credit. Presumably this would allow companies that are not getting the use of the incremental credit to at least get some credit.

Now, would an update in the base period to cover more recent years not be effective in helping companies who are suffering a declining percentage of R&D spending to sales?

Mr. CHERECWICH. Updating that base period would work fine. But then we would have to come back here in four or five years to address the issue all over again. I think if we can fix this thing permanently, both by making the credit permanent and by having a simple, easy-to-administer plan, then we would not be back in here talking to you again.

Senator HATCH. All right. What effect do you think moving to a flat rate credit would have on your R&D expenditures and to your investment in R&D as a whole; would we not be moving away from an incremental approach?

Mr. CHERECWICH. We would perhaps be moving away from a incremental approach. Moving to a flat rate credit would enable me to sit down with our director of research and work out with him what his plans are going forward in the future.

The budgeting process does not take place at some period of time after we have closed the year, calculated the credit from last year, and seen what's going on. We start our budget cycle for next year early in this year.

By having the flat rate credit, I would be able to sit down with him and, as we are discussing how much money to spend on R&D and where to spend that money on R&D, we will be able to take this into account in our planning.

It may be a situation where, yes, our absolute dollars are shrinking, but they would not shrink as much if we did not have this credit, or they might stay in the United States instead of going someplace offshore if we did not have this credit.

Senator HATCH. All right.

Mr. Glick, as I understand it, a company such as Genentech, who is engaged in medical research, has available to them either the research credit, or, for research into rare diseases, a credit for orphan drug research which, of course, I helped to bring about.

How does the orphan drug credit relate to the research credit? And I am aware that the orphan drug credit expired December 31st of last year.

Mr. GLICK. Well, the orphan drug credit is focused on clinical testing for rare diseases. It provides the whole Orphan Drug Act provides a very strong incentive to go after diseases that companies might not otherwise go after.

There is a company now going after a disease that I think affects only a couple of hundred children, that their immune system breaks down, and the orphan drug is a critical part of their efforts.

About half of the orphan drugs are currently being worked on, I believe, by the biotech industry, so the whole orphan drug issue is extremely important to us.

The credit would be a very strong incentive. The way it works is, you get the orphan drug credit in lieu of the regular research credit. It is a more powerful credit, a higher rate. We would certainly strongly endorse getting the orphan drug credit extended, made permanent.

The one change that would be very important to the industry is, that the credit needs to be part of a carry-forward. Under prior law, either you claimed the orphan drug credit or you lost it.

And, as most biotechnology companies are in a lost carry-forward position because of the research intensity and the long lead times to get new products under prior law, most companies could not take the credit.

So, we would strongly endorse having the orphan drug credit made permanent, and the main change being to have it has a carry-forward, as all other credits in the law currently are.

Senator HATCH. I see.

Now, your testimony emphasizes the importance of the permanent research credit. You have just gotten through saying that you would like to see the orphan drug research credit made permanent. Do you think the currently structured R&E credit should be extended as it is now, or do you think that we can make certain changes that might improve it? If so, what changes would you make?

Mr. GLICK. Well, permanence is the main message, I think, of today. It is extremely important for both the entire coalition I am testifying on behalf of, and the biotech industry and Genentech, that the credit be made permanent. We are, right now, going through a 5-year planning cycle deciding as of, literally today, which research projects to continue, which not to continue.

And, knowing whether the credit is there or not will have a direct impact on whether we invest in some of the higher-risk projects in the AIDS and cancer area. So, this is a very important issue to us.

We are very sensitive to the fact that there has been some issues raised on the structure. We have some concerns ourself and we would look forward to working with the committee on trying to change those. But I think our strong emphasis right now is on permanent extension of the credit.

Senator HATCH. Thank you.

Mr. Gregg, do you think a permanent credit without structural modifications would be important to the growth of high-tech start-up companies in the future?

Mr. GREGG. Oh, absolutely no question about it. Sequent started in 1983. When you are trying to calculate how much you are going to spend on research and development, particularly when you are trying to provide returns to your venture capital investors and ultimately to your public investors as we have been doing since 1987, you have got to make those decisions about R&D expenditures at the margin.

It is those additional expenditures, the real difficult decisions to make for your next generation product, that without a permanent

credit those decisions are almost impossible to make. In speaking for Sequent specifically, we have made very tough research and development decisions over the last 5 years and we definitely take whether we have got a credit into account when we make those decisions.

Senator HATCH. All right.

Could you once again explain the so called "notch baby" issue and what should be done to correct it? Is the change that you proposed in your testimony for those start-up companies supported by all companies affected by the notch baby problem, or are there other alternatives that you might have?

Mr. GREGG. This is a classic, very technical glitch, and one of those unintended results of changing the legislation in 1989. Very simply, if we just change the start-up definition to include those companies that happened to be, just by sheer luck or whatever, formed in 1984, 1985, or 1986, it eliminates the problem for any companies that are in this very technical situation.

Senator HATCH. Well, if the research tax credit were made permanent today with the technical glitch corrected that you are talking about, what changes in business strategies, for instance, would take place in your company or similar companies?

Mr. GREGG. We are making decisions today. We just finished our 1995 spending plans in the last three months. When we make those plans, we have to anticipate what we are going to spend in 1996, 1997, and 1998 on research and development.

At the same time, as the vice president of Finance at Sequent, my responsibility is to return our shareholders' value back to our shareholders. It is basically understood that we will return about a 10-percent return to those shareholders; anything less than that, my stock price will be severely impacted.

When we make our R&D decisions, any credit that we have will result in a direct incremental investment that I will make in research and development while still being able to return those returns to the investors.

So, it is absolutely at the margin. What is particularly discouraging, but also encouraging if we can get this permanent, is the types of expenditures that are at the margin.

In research and development, the first projects to get cut are the ones that look like they are going to involve a little higher risk and, therefore, offer a potentially much higher return, which I believe, as far as tax policy, is the very research we absolutely want to encourage as opposed to routine R&D.

Senator HATCH. Thank you.

Mr. Simpson, what role has the research credit played in Novell's phenomenal growth?

Mr. SIMPSON. I believe it has played a significant role. Research projects, by their nature, are somewhat uncertain. I think as far as providing the capital to offset some of that risk, it has just been critical.

To Novell and to others in our industry, research is the most critical aspect, I would say, of our business. That is how we stay competitive, through the development of technologies. We have gone to great lengths to acquire technologies.

As we evaluate projects, we analyze the company's budget situation and the impact of the R&D credit on it. Projects on the margin are the ones that do not make it into the budget and are not funded. It is always a very difficult issue as far as, should a particular project be in or out.

In Novell's case, we spend, on a financial statement basis, 17 percent of our revenues on research and development, which is high even in our industry, but we are very committed to the development of new technologies. The R&D credit is critical. The credit is critical in offsetting that risk and in developing those products.

Senator HATCH. Well, how might the credit be more effective in helping new high-tech companies to get off the ground and become profitable, to begin with, but more profitable as time goes on?

Mr. SIMPSON. I think that the review of the base period merits discussion as far as how incentives can be provided to start-ups. I think at that phase it is absolutely critical that they receive the necessary capital to fund projects. I mean, they are risky projects. The capital is not necessarily there. That would merit some additional study. It is absolutely necessary, I think, that Congress move ahead with permanence.

And, while I am not suggesting that structural changes should not be reviewed, I think that permanence sends a strong message, to both smaller companies as well as larger ones, that the credit will be there and will be made available.

Senator HATCH. As you can see from the testimony that we have been getting here today from some of the other witnesses, there are many companies who undertake research who find the research credit unavailable because of declining sales or because of other problems with the way the credit works.

In your opinion, how can the credit be restructured so that all firms are given an incentive to increase their level of research expenditures?

Mr. SIMPSON. I would say, first off, I believe permanence is the priority. That sends the message that there is a program there and it is made permanent. I do think that, as several of the other witnesses have suggested, there are structural problems.

It becomes complicated with the revenue offsets, and we would certainly be more than happy to work with the appropriate parties on how that might be developed. I understand the problem. I think, in some segments of the economy, it is due to a transition out of defense spending, perhaps, and you have to look at the issues fairly specifically to come up with solutions. I think a base period restructure has some merit. But, policies can always be improved.

For example, there is another issue, just to throw this out on the table, with regard to Novell. One could argue that companies that spend a great amount in increased R&D are limited in the benefits they receive in that there is a 50 percent limitation on the available credit beyond the base year amount.

Arguably, Novell is not receiving the full benefit of the tax credit because of the 50 percent limitation. So, there are lots of ways to approach improving the credit. I am certainly sympathetic to the other companies and the other industries, that they are feeling some of the restrictions of the credit.

Senator HATCH. Well, thank you. I appreciate this panel very much. I think we are learning a lot about this and I hope we can do a very good job before this year is out. I personally would like to make it permanent, as you know. Thank you for being here. We appreciate your testimony.

Our third panel has one witness, a very important witness, in my eyes. Mr. Donald Alexander, a partner of the Washington law firm of Akin, Gump, Strauss, Hauer & Feld, who is testifying on behalf of the Ad Hoc 861 Coalition. Mr. Alexander, we welcome you to the committee and look forward to taking your testimony at this time.

STATEMENT OF DONALD C. ALEXANDER, PARTNER, AKIN, GUMP, STRAUSS, HAUER & FELD, WASHINGTON, DC, TESTIFYING ON BEHALF OF THE AD HOC 861 COALITION

Mr. ALEXANDER. Mr. Chairman, the subject that I am here to discuss with you ties directly into the subject discussed by the previous two panels.

The previous panelists, particularly Mr. Simpson, pointed out that the United States is falling behind some of our foreign competitors in research and development expenses.

At least 16 foreign countries provide vast incentives to perform research in those countries, and we need a permanent solution, a permanent solution that would encourage the research that is vital to our National growth, and a permanent solution which would not provide an incentive for a company now engaged in research in Utah to move that research to Germany and Japan.

The regulations under Section 861 provide just such an incentive, Mr. Chairman. The way they do it is to treat expenditures incurred for research in the United States by a worldwide company as if a substantial part of such expenditures had been incurred abroad.

They do this for the purposes of computing the foreign tax credit, and the foreign tax credit is vital to prevent double taxation to companies that have foreign operations.

By allocating through this accounting fiction research expenditures actually incurred here, incurred in Utah, to foreign income, they reduce the foreign tax credit, thus creating a tax disincentive to conduct research in the United States and a tax incentive to move that research abroad.

This double taxation created by regulations issued in 1977 has been addressed by Congress several times. Congress made it clear early on that it did not like what Treasury and IRS were doing. Congress has enacted a whole series of temporary moratoria to prevent these harsh regulations from taking effect.

At one time in 1992, Treasury agreed with Congress and Treasury changed its own regulations to provide a much fairer and much more generous allocation of research expenses conducted in the United States to U.S. income, thus mitigating this problem of double taxation.

Unfortunately, that relief expired, and unfortunately the last moratorium that Congress has enacted to prevent the 861 regulations from coming into effect expired last December. A permanent solution is badly needed.

Treasury has the authority to craft such a permanent solution and implement it by regulations. In fact, the 1977 regulations were

reasonably fair for the first year, and then became increasingly harsh.

Treasury, in 1992, discovered that it had the authority to allocate 64 percent of U.S. research expenses to U.S. income for foreign tax credit purposes. Surely Treasury has the authority to accept what Congress did when it last addressed this issue and give taxpayers, including those companies that testified earlier, a permanent and reasonable rule that will reduce double taxation, and that will reduce the present incentive that the 1977 regulations have permitted to take effect, to move research abroad.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Alexander appears in the appendix.]

Senator HATCH. Well, thank you, Mr. Alexander. We appreciate your expertise and your appearing before the committee here today, as we have all the witnesses.

As I understand it, you have mentioned regulations that Treasury issued in 1977 that require multi-national corporations to allocate part of their research and development spending to income earned overseas.

Now, this reduces the amount of foreign tax credits available to a company, and the effect is that companies with foreign sales lose part of their R&D deduction, which gives these firms an incentive to move their research overseas. As I understand it, that is the point you are making.

Mr. ALEXANDER. That is correct, sir.

Senator HATCH. All right. Now, these regulations have been suspended time after time, you have brought out here today.

Mr. ALEXANDER. That is right.

Senator HATCH. Has it always been Congress who has suspended the regulations, or has the Treasury Department suspended them from time to time?

Mr. ALEXANDER. The Treasury suspended these regulations in 1992. The Deputy Assistant Secretary of the Treasury has testified that the regulations were too harsh and that a permanent solution was needed. Unfortunately, the relief granted by Treasury was only short-term relief, creating the problems that have been discussed earlier by the other two panels in connection with the R&D credit. We have the same problem here, sir.

Senator HATCH. Well, what is going to happen in 1995 if the neither the Treasury, nor the Congress, acts on this issue now that the latest moratorium has expired?

Mr. ALEXANDER. The expiration of the last moratorium means that the 1977 regulations are now in effect. It means that the incentive to move research abroad is there by regulation. By regulations that need not have taken that harsh a position, but by regulations which would be in effect, finally, if the Treasury does not do something about them, or if Congress does not.

We recommend in our statement, Mr. Chairman, that this is a matter that Treasury should solve and should solve promptly. But, if Treasury does not solve the problem, then Congress should step in and solve it for them.

Senator HATCH. All right. Now, you stated that the Treasury Department is studying whether they have appropriate authority to

modify the regulation. So, just to make this point clear, it seems to me that if Treasury had the authority to issue the regulation originally they have the authority to modify them. Do you agree with that statement?

Mr. ALEXANDER. I certainly agree with that, Mr. Chairman. I think that the question of lack of authority borders on the frivolous. Of course Treasury has the authority to issue regulations that have a reasonable basis. Clearly the 1992 action of the Treasury had a reasonable basis, and Treasury could implement that permanently.

Senator HATCH. All right.

Mr. ALEXANDER. If Treasury can decide, as it seems to have just decided, that you can check the box to decide whether your organization will report as a partnership or as a corporation, Treasury can surely issue reasonable regulations under 861.

Senator HATCH. Just a couple of more questions. Do you have any idea what the revenue effect of the Treasury might be of keeping last year's 64 percent apportionment figure versus whatever figure would result from the enforcement of the 1977 legislation?

Mr. ALEXANDER. No, sir, I do not have a current figure. A response, of course, is that Treasury did have the authority and right—and I think the duty—to give the relief that it gave in 1992. It should have given that relief permanently.

Treasury, having that authority under the statute, would find, if I understand the rules correctly, a zero revenue cost by Treasury's continued exercise of that authority.

Senator HATCH. Well, other than the incentive to move U.S. research overseas that you mentioned in your testimony, does this issue have any effect on a company's willingness to spend more on research?

Mr. ALEXANDER. Certainly it does. It inhibits a company engaging in research, just as the operation of the credit and the nature of the credit, discussed earlier today, inhibits a company's decision to spend more on research.

It not only inhibits the company's decision to spend more, but it inhibits the company's decision and affects the company's decision on where to spend the research.

Why should the United States tax laws, and particularly regulations issued under the very broad provision of those laws, cause companies to have to move research abroad?

Senator HATCH. You make a lot of good points. You are making the point that a lot of our research is going abroad, plus we are reducing research without the appropriate incentives and we are not comparable to some of the other major industrialized nations, particularly Germany and Japan.

Mr. ALEXANDER. We are not, and we should be more comparable for the future of this country, Mr. Chairman.

Senator HATCH. Well, thank you. I think you make some good points. I have really appreciated everybody who has testified here today, and especially you, Mr. Alexander. All the witnesses have been very helpful to us.

I hope we can get this matter straightened out here. I will just leave this open for all witnesses, that any further help you can give us, we would like to have it, because I would like to get this done

as well as we possibly can. I am going to do everything in my power to try and get it done.

Thank you for appearing here today.

Mr. ALEXANDER. Thank you, Mr. Chairman.

Senator HATCH. With that, we will recess the committee until further notice.

[Whereupon, at 11:03 a.m., the hearing was concluded.]

APPENDIX

ADDITIONAL MATERIAL SUBMITTED

PREPARED STATEMENT OF DONALD C. ALEXANDER

INTRODUCTION

Chairman Hatch, Senator Bradley, and Members of the Subcommittee on Taxation and IRS Oversight, my name is Donald C. Alexander. I appear before you today on behalf of the Ad Hoc 861 Coalition, a group of diverse companies interested in seeking a permanent solution to the almost 18 year controversy over Treasury Regulation Section 1.861-8(e)(3), the research and experimentation expense allocation rules. These rules are commonly referred to as the so-called "861 R&D allocation regulations." The companies on whose behalf I am testifying include Warner-Lambert Company, AlliedSignal Inc., Motorola, Inc., Pfizer Inc., The Procter & Gamble Company, and TRW Inc. These companies share the common characteristic of being research-intensive, U.S.-based companies with substantial global sales, precisely the type of firms that will drive our economy in the next century. Rather than encourage their prosperity, the 861 R&D allocation regulations hinder the growth of such companies.

As you know, Congress provided a temporary modification to the 861 R&D allocation regulations in the Omnibus Budget Reconciliation Act of 1993 ("OBRA '93"). We support the approach provided in OBRA '93, and respectfully request that you work with the Administration to ensure that such an approach is promptly adopted through regulations. Otherwise, corrective legislation will be needed.

861 R&D ALLOCATION REGULATIONS: BACKGROUND AND PROBLEMS

Since first issued in 1977, the 861 R&D allocation regulations have been the subject of significant debate at both the legislative and administrative level. Under the regulations, U.S. companies with foreign operations are required to treat a portion of their domestic research and development expenses as if they were conducted abroad for purposes of determining their foreign tax credits. Since no foreign country allows for a deduction of R&D conducted in the U.S., many U.S. companies thus effectively lose a deduction for these expenditures.

Whether the example is Warner-Lambert performing R&D in Ann Arbor, Michigan, TRW performing R&D in Cleveland, Ohio, or AlliedSignal performing R&D in Morristown, New Jersey, the problem with the 861 R&D allocation regulations is the same. The regulations penalize U.S.-based companies that perform the bulk of their R&D operations in the U.S. by requiring these companies to engage in an accounting fiction which leads to double taxation. Requiring a U.S. company to treat U.S. R&D expenditures as if performed in a foreign country creates an incentive to move such operations abroad. This is the only way to ensure that the expenses of such operations would become a direct deduction in the computation of overall taxes. Moving research abroad runs counter to the goal of fostering U.S. investment in R&D and is clearly not in our national interest.

The 861 R&D allocation problem was created by Treasury's overzealous effort in 1977 to draft regulations without a clear understanding of congressional intent. Since 1977, Congress and the Administration have advocated and adopted a number of temporary moratoria to prevent the full implementation of the 861 R&D allocation regulations. Beginning in 1981 and continuing through 1986, Congress suspended the 1977 regulations and allowed taxpayers to allocate 100 percent of their domestic deductions for R&D to U.S. source income. In 1987, this moratorium was modified to allow a 50 percent exclusive apportionment, among other changes. From 1988 through 1992, with the exception of a short period in 1988 and 1989, Congress

enacted a series of provisions that generally provided for a 64 percent exclusive apportionment.

In 1992, the Chairmen of the Finance and Ways and Means Committees urged Treasury Secretary Brady to deal with the unsatisfactory problems associated with the regulations administratively. Treasury responded, but only on a temporary basis. It is important to note that this interim response was more generous than the most recent moratorium, which was enacted as part of OBRA '93. The OBRA '93 moratorium expired December 31, 1994. Therefore, the 1977 regulations must be applied for future years unless a regulatory or legislative solution is adopted.

PERMANENT SOLUTION IS NEEDED

None of the aforementioned moratoria provided what research-intensive companies need most desperately—permanent, reasonable guidance as to the proper method for allocating R&D expenses. The Ad Hoc 861 Coalition believes that the most effective solution would be to modify existing 861 R&D allocation regulations, following the approach provided for in OBRA '93.

We sincerely appreciate the fact that the Treasury Department is focusing now on this issue, and hope that an agreement can be reached that provides a permanent and reasonable method of allocation. We ask for your assistance in achieving this goal, and request that you provide a legislative remedy to this problem if a fair regulatory solution is not forthcoming as soon as practicable.

TREASURY HAS AMPLE AUTHORITY TO ISSUE REASONABLE 861 R&D REGULATIONS

Treasury Department officials have stated that they are making a determination as to whether appropriate authority exists to modify the 861 R&D regulations, and they are reviewing possible options. We strongly believe that such authority is clear. As explained below, Congress has already given Treasury the authority to draft and implement reasonable 861 R&D regulations.

Section 861, enacted in 1954, provides rules for defining "gross income from sources within the United States"—that is, domestic income. Section 861(b) provides for the deduction of expenses, losses, and other items properly apportioned or allocated to such gross income. The statute does not specify the specific expenses—R&D, for example—which should be included under section 861, nor does the statute indicate the manner or details of computing such deductions. In other words, Congress gave Treasury the authority to determine which expenses to include and what methodologies were appropriate, as long as the method reasonably apportioned or allocated such expenses.

Over the years, a number of authoritative opinions, memoranda and other documentation have addressed the issue of whether Treasury has authority to modify the 861 R&D regulations. For example, Erwin N. Griswold, the constitutional scholar, wrote a legal opinion in 1992 stating that the Treasury Department has broad authority to issue regulations for the allocation and apportionment of deductions, and that regulations issued under such authority may be challenged successfully only if Treasury can offer no reasoned basis for their issuance. That is, such regulations may be struck down only if they are unreasonable and plainly inconsistent with the statute.

DOMESTIC R&D CREATES JOBS AND ENHANCES U.S. COMPETITIVENESS

Providing reasonable, definitive guidance to research-intensive companies is essential for two basic reasons: maintaining U.S. jobs and sustaining American competitiveness. As has been so clearly articulated by the other panelists today, U.S. based R&D is critical to our nation's continued economic growth. American technology has been a major source of U.S. export strength, which is vital to creating high-wage jobs and enhancing U.S. companies' positions in the global economy.

First, the 861 R&D regulations inherently contradict the policy objectives of the section 41 R&D credit by effectively disallowing the benefits of the credit. U.S. R&D policies should not work at cross purposes; they should foster—not impede—U.S. investment in R&D. Unfortunately, the 861 R&D regulations penalize companies that perform their R&D in the United States.

Second, research-intensive companies need a permanent solution to the 861 problem in order to compete with foreign businesses who benefit from numerous R&D incentives offered by foreign governments. These foreign companies are not penalized for the R&D performed within their borders. Most of our trading partners have aggressive policies to attract R&D operations. By increasing overall U.S. R&D costs, the 861 R&D regulations provide a competitive disadvantage for U.S. R&D performers vis-a-vis foreign companies performing R&D outside of the U.S.

CONCLUSION

Over seventeen years of confusion is enough. We urge you to work with the Administration to ensure that a permanent, reasonable regulatory solution to the R&D expense allocation issue is adopted as soon as possible, and to enact corrective legislation if such relief is not promptly forthcoming. We look forward to working with you and the Treasury Department to achieve this goal.

Thank you for providing me with an opportunity to testify. I would be pleased to answer any questions that you may have.

PREPARED STATEMENT OF PAUL CHERECWICH, JR.

INTRODUCTION

My name is Paul Cherecwich, Jr., I am the Vice President of Tax and Tax Counsel for Thiokol Corporation, a Utah based multinational with business operations in the space, defense and fastening systems industries. I am here today representing the Aerospace Industries Association of America, Inc. (AIA), as the Chair of its Tax Matters Committee.

AIA is the non-profit trade association representing the nation's manufacturers of commercial, military and business aircraft, helicopters, aircraft engines, missiles, spacecraft and related components and equipment. With a membership of more than fifty of the nation's largest manufacturers, AIA represents every significant employer in this industry.

The forces of international competition and the end of the Cold War continue to converge on the U.S. aerospace industry. Its members have been and continue to downsize—in 1994 U.S. aerospace sales fell19 percent, investment in new plant and equipment fell 8.4 percent, employment fell 7.8 percent and the industry's trade surplus fell 5.5 percent. In spite of this decline in business fortunes, the aerospace industry still remains an important segment of the U.S. economy. In 1994 it provided 836,000 U.S. jobs and $38.5 billion of exports from the U.S. Research and development (R&D) is the lifeblood for the continued success of the U.S. aerospace industry. R&D is what I would like to talk about today.

THE R&D TAX CREDIT AND ITS IMPLEMENTATION

A U.S. tax credit is currently provided under §41 of the Internal Revenue Code for increasing R&D expenditures on an incremental basis. Taxpayers only obtain the credit to the extent their current year's ratio of R&D expenditures to sales exceeds that same ratio for the base period 1984-1988. When calculating the current year's ratio of R&D expenditures to sales, the sales figure that must be used is the average annual gross receipts for the prior four years.

Most aerospace companies are denied the R&D credit because of the base period limitation. This limitation works against the industry in several ways:

1. As the industry downsizes, R&D as a percentage of current year's sales is static or declining.
2. As industry mergers occur, multiple R&D programs are being combined and economies of scale are reducing total dollars expended.
3. As the industry "re-engineers" itself to become more efficient and competitive, it is also learning to conduct R&D in a more cost effective manner.
4. As sales decline, the statutory formula for computing the ratio of current year R&D expenditures to sales is punitive.

Let me discuss the fourth point in more detail. Attached to my testimony is a chart showing what happens to a business that grows for four years, and then suffers the nine percent annual decline in sales that the aerospace industry is facing. This business maintains its research at a constant percentage of annual sales. Because of the operation of the base period formula, this business would be entitled to an R&D credit while its overall business is growing, but would not get a credit if it suffered business declines.

NEED FOR CHANGE

Right at the very moment when the business in the example needs to keep its R&D going, our tax policy offers no encouragement to maintain its level of R&D spending constant as a percentage of sales, let alone increase spending.

The solution to this dilemma is to modify the credit to provide some incentive to aerospace and other firms that conduct important research but that can not maintain the level of expenditures necessary to obtain benefits under the current incremental credit. By doing so, we would help those firms most in need of help, and would discourage them from moving their R&D activity offshore in search of the credits that at least sixteen other countries provide.

In calling for a change in the R&D credit, we recognize that there are a few companies for whom the present law incremental credit works exactly as intended. These companies (including a few AIA members) have growing sales, and growing levels of R&D expenditures. Therefore, we are suggesting that these companies not be penalized by any changes to the existing credit.

PROPOSAL

To accomplish the goals outlined in this paper, AIA proposes that taxpayers should be permitted to elect to change from the current twenty percent incremental approach to a five percent credit on all qualified R&D expenditures once every five years (1995, 2000, 2005, etc.). The election, once made, would be binding for all future years.

Thank you for the opportunity to appear before you today. We appreciate the Committee's support for our industry and would welcome your support for this initiative.

IMPACT OF BASE PERIOD AND AVERAGE SALES COMPUTATION ON RESEARCH CREDIT

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
Sales	$1,000,000	$1,100,000	$1,210,000	$1,331,000	$1,211,210	$1,102,201	$1,003,003	$912,733	$830,587	$755,834
R&D @ 3% of Sales	$30,000	$33,000	$36,300	$39,930	$36,336	$33,066	$30,090	$27,382	$24,918	$22,675
Average Sales Base	N/A	$1,000,000	$1,050,000	$1,103,333	$1,160,250	$1,213,053	$1,213,603	$1,161,854	$1,057,287	$962,131
Base Period @ 3%	N/A	$30,000	$31,500	$33,100	$34,808	$36,392	$36,408	$34,856	$31,719	$28,864
Increase in R&D	N/A	$3,000	$4,800	$6,830	$1,529	($3,326)	($6,318)	($7,474)	($6,801)	($6,189)
Credit @ 20%	N/A	$600	$960	$1,366	$306	$0	$0	$0	$0	$0

NOTES: First Year Credit is Computed Under Start-Up Rules.
Sales Growth at 10% Until Year 4, Whey They Began to Decline at 9%.

PREPARED STATEMENT OF NATWAR M. GANDHI

In 1981 Congress created the research tax credit to enhance the competitive position of the U.S. 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 slightly over $1.5 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 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, no one has been able to estimate the credit's net benefit to society. Given the absence of empirical data, 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. But, over time, the fixed base of the credit has the potential to become too generous for some taxpayers, resulting in undue revenue losses, and too restrictive for others, resulting in less overall research stimulated by the credit. If the credit is extended, Congress may want to provide for reviewing this base periodically 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.

Mr. Chairman and Members of the Committee: 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 and newly available data, we have four major observations to offer: [1]

—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. But, over time, the fixed base of the credit has the potential to become too generous for some taxpayers, resulting in undue revenue losses, and too restrictive for others, resulting in less overall research stimulated by the credit. If the credit is extended, Congress may want to provide for reviewing and adjusting this base 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 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.

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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).

CORPORATIONS USING THE RESEARCH CREDIT

In tax year 1992 corporations earned slightly over $1.5 billion worth of research credits.[2] Most was earned by large corporations in the manufacturing sector—74 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), electronic machinery, motor vehicles, and nonelectronic machinery. (Attached Tables 1 through 3 provide 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 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.

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 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 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.

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.

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. Similarly, 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 credit was equal to the average of qualified expenditures for the 3 previous tax years or 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. 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 be much higher.

The revision of the credit in 1989 significantly increased the effective incentive of the credit by breaking the link between current spending and future base

[2] These data were extracted from the Internal Revenue Service's Statistics of Income and exclude credits earned by individuals, partnerships, and S corporations.

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 4 provides a sample computation under the new rules).

A concern with 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. Our earlier work showed that many firms maintained substantially different growth rates in their spending and sales over extended periods of time. To the extent that taxpayers change their spending behavior over time, the credit computation will be too generous for some taxpayers, resulting in undue revenue losses, and too restrictive for others resulting in less overall research stimulated by the credit. If many corporations fall into either of these categories, there may be a need to adjust the base to ensure that the credit continues to provide an attractive incentive at an acceptable revenue cost.

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 four reasons for questioning research expenditures. Rather than for qualifying, innovative research, revenue agents believed the expenditures were for (1) adapting existing capabilities, (2) routine or cosmetic alterations, (3) overhead and administration, or (4) ordinary testing. In general, most agents found it difficult to distinguish spending for new products or functions from spending that made 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 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 like 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. When detailed project accounting does not exist, both IRS and the taxpayer may find it difficult to separate out the cost of personnel employed in specific projects years after the fact. Thus, the costs of administering the credit, according to an IRS official, are substantial for both IRS and the taxpayer.

CONCLUSION

Given the lack of empirical data 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, it may also want to ensure that the credit continues to provide 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 periodically and adjusted as needed.

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

Table 1: Number of Corporations Earning the Credit and Amount of Credit Earned, by Industry, 1992

Industry	Number of corporations earning the credit	Percent of total	Amount of credit earned (dollars in millions)	Percent of total
Agriculture	96	1	$4.2	-
Mining	19	-	3.5	-
Construction	46	1	2.3	-
Manufacturing	5,026	65	1,157.7	76
Transportation and public utilities	145	2	98.3	6
Wholesale trade	432	6	25.2	2
Retail trade	98	1	8.0	1
Finance, insurance and real estate	97	1	17.8	1
Services	1,790	23	198.2	13
Total	7,749	100	1,515.4	100

Notes: These data exclude credit recipients that are individuals, partnerships, or S-corporations. The numbers are based on sample data and, consequently, are subject to sampling error. A dash represents less than .5 percent. 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.

Table 2: Number of Corporations Earning the Credit and Amount of Credit Earned, by Manufacturing Industry, 1992

Manufacturing industry	Number of corporations earning the credit	Percent of total	Amount of credit earned (dollars in millions)	Percent of total
Food	122	2	14.9	1
Textile	40	1	3.9	-
Lumber	23	-	.5	-
Furniture	30	1	1	-
Paper	38	-	15.5	1
Printing	384	8	8.2	1
Chemicals	519	10	356.7	31
Petroleum refining	26	1	23.9	2
Rubber	146	3	9.2	1
Stone, glass	65	1	6.5	1
Primary metals	44	1	5.1	-
Fabricated metals	296	6	9.6	1
Machinery, except electric	556	11	160.5	14
Electronic machinery	1,545	31	203.2	18
Motor vehicles	43	1	198.4	17
Transport	46	1	12.3	1
Instruments	713	14	97.3	8
Other	391	8	30.9	3
Total	5,026	100	1,157.7	100

Notes: These data exclude credit recipients that are individuals, partnerships, or S-corporations. The numbers are based on sample data and, consequently, are subject to sampling error. A dash represents less than .5 percent. 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.

Table 3: Number of Corporations Earning the Credit and Amount of Credit Earned, by Asset Size, 1992

(Dollars in millions)

Asset size class	Number of corporations earning the credit	Percent of total	Amount of credit earned (dollars in millions)	Percent of total
$0 - less than $1	2,220	29	$29.3	2
$1 - less than $10	3,138	40	111.5	7
$10 - less than $50	1,146	15	106.5	7
$50 - less than $100	323	4	67.7	4
$100 - less than $250	303	4	83.4	6
$250 - less than $500	170	2	86.8	6
$500 - less than $1,000	132	2	87.5	6
Greater than $1,000	317	4	942.8	62
Total	7,749	100	1,515.4	100

Notes: These data exclude credit recipients that are individuals, partnerships, or S-corporations. 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.

Table 4: Sample Calculation of the R&E Tax Credit for 1990[3]

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		
3. 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

(268690)

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

RESPONSE TO A QUESTION SUBMITTED BY SENATOR CONRAD

Question. According the President's fiscal year 1996 budget, the Federal government currently spends about $73 billion a year on research and development. Meanwhile the cost of permanently extending the R&D credit is only about $8.1 billion over 5 years. Are there areas where research and development which is currently funded by the federal government could be more efficiently accomplished through the private sector? In other words, are there areas where it would be more productive to cut federal spending on R&D and use those funds to pay for an extension of the R&D credit?

Answer. One of the motivating factors behind the research tax credit is the belief that the private sector can identify socially beneficial research projects more effectively than can the federal government. The credit does not encourage companies to invest in one particular sector or field over another. It would be difficult to predict what private sector research projects would replace the federal research projects that might be cut in order to fund an extension of the credit.

PREPARED STATEMENT OF MARTY GLICK

I. INTRODUCTION

Mr. Chairman and distinguished members of the Subcommittee:

My name is Marty Glick. I am Vice President and Treasurer of Genentech, Inc. I am appearing today on behalf of the R&D Credit/Section 861 Coalition ("Coalition") and Genentech.

On behalf of the Coalition and Genentech, I would like to thank you for convening this hearing and for providing Genentech and the Coalition the opportunity to testify and participate in your Subcommittee's consideration of whether the research and experimentation tax credit, commonly known as the R&D Credit, should be made permanent.

A. R&D Credit/Section 861 Coalition

I am also pleased to be able to represent today the members of the R&D Credit/Section 861 Coalition. The Coalition is comprised of several prominent trade associations and their many members, including the American Electronics Association, the Biotechnology Industry Organization, the Business Software Alliance, the Electronic Industries Association, the Information Technology Industry Council, the Pharmaceutical Research & Manufacturers of America, and the Software Publishers Association. These trade associations represent several thousand companies who employ several million U.S. workers. The industries represented by the Coalition are among the most dynamic and fastest growing industries in the United States. The members of these associations are closely following this issue and are very strong and active supporters of a permanent R&D Credit.

B. Genentech. Inc.

Genentech, with headquarters in South San Francisco, California, is a pioneer biotechnology company that discovers, develops, manufactures and markets human pharmaceuticals for significant unmet medical needs. The company is traded on the New York and Pacific stock exchanges.

Genentech employs over 2,700 people, about 900 of which are involved in research and development. The products currently manufactured and marketed by Genentech in the United States include Protropin® human growth hormone for treating children with growth hormone inadequacy; Nutropin® human growth hormone also for treating growth hormone inadequacy in children and for children's growth failure due to chronic renal insufficiency; Activase® (tissue-plasminogen activator) to dissolve blood clots in the arteries of heart attack patients and patients with blood clots in the lungs; Actimmune® for treating chronic granulomatous disease, an inherited immune system deficiency; and Pulmozyme® (DNase), a new therapeutic drug for cystic fibrosis.

Genentech has a strong commitment to the development of new biotech products to serve our nation's health needs. In recent years, Genentech has reinvested as much as 45% of its revenues (or over $300 million annually) into research and development. This figure is one of the highest in the United States.

The products Genentech is currently researching and investigating include a potential treatment for severe cases of breast and ovarian cancer; an AIDS vaccine being evaluated as a prophylactic to prevent HIV transmission; and an insulin-like growth factor to treat Type II diabetes.

To ensure continued scientific excellence, in late 1992, Genentech opened a 275,000 square foot, $85 million facility in California, currently the world's largest research facility devoted solely to biotechnology research.

II. IMPORTANCE OF A PERMANENT R&D CREDIT

Mr. Chairman, like the other members of our Coalition, intensive research and development efforts are vital in our company's ability to retain its economic viability and develop the products and services demanded and needed by American consumers. We strongly and whole-heartedly urge Congress to make the R&D Credit permanent.

Since its inception, the R&D Credit has provided a valuable economic incentive for U.S. companies to increase their investment in research and development in order to maintain their competitive edge in the global marketplace. A permanent R&D Credit is critical to fast-growing R&D intensive companies such as those in the biotechnology industry and the many other industries represented by the Coalition.

For these companies, an incentive to increase investment in R&D plays a critical role in determining whether future research projects, many of which span up to twelve years in length, are started, continued or abandoned.

A permanent R&D Credit is important both to enable U.S. companies to remain competitive internationally and to encourage U.S. industry to continue R&D activities in the U.S. rather than moving such activities offshore. Most of the major industrialized European and Asian countries (including the United Kingdom, France, Germany, Japanese and others), as well as Canada, offer various R&D-related tax and financial incentives to assist native companies and to encourage foreign companies to locate R&D projects within their borders. These incentives lower the cost of R&D in these foreign jurisdictions and provide foreign companies competitive advantages over U.S. industries absent similar U.S. R&D incentives.

III. EFFECTIVENESS OF R&D CREDIT

The R&D Credit has been effective in achieving the goals for which it was originally enacted. A key finding of the 1994 study by Rudy Penner on behalf of the KPMG Peat Marwick Policy Economic Group entitled "Extending the R&E Tax Credit; The Importance of Permanence" is that the marginal effect of one dollar of the R&D Credit has been to stimulate one dollar of additional private R&D spending in the short-run and as much as two dollars of additional R&D spending in the long-run.

Opponents of the Credit have argued that the Credit is not needed since R&D activities will be done with or without a credit. Mr. Chairman, this is simply not true for the biotech industry and the similarly research-intensive industries represented by the Coalition. Although high technology companies will always conduct R&D, more projects exist than can be funded and promising ideas must often be cut from the list. The R&D Credit provides an effective financial incentive for companies to engage in marginal R&D projects which might otherwise be cancelled. These projects have, and will continue to produce important technological advances. The Credit has and is currently supporting such valuable medical research efforts as breast cancer, cystic fibrosis, AIDs, and other disease related research that otherwise, because of economic considerations, may not be done or maintained at existing levels without the Credit's support. Indeed, the Credit could well make the difference in finding cures for such diseases. With important projects like these, the R&D Credit is needed not only to benefit American industry but to benefit society as a whole and the quality of life of all Americans.

In the medical arena alone, the R&D Credit has stimulated numerous companies that are developing a strong base of "knowledge workers" engaged in such in-house R&D efforts as Theratec (innovative drug delivery systems); Wescor (instrumentation development for clinical labs); UBTI (independent testing of medical devices, pharmaceuticals and chemicals); and Sarcos (research on prosthetic elbow devices).

IV. LACK OF PERMANENCE REDUCES EFFECTIVENESS OF R&D CREDIT

Despite its success, the incentive benefit of the current R&D Credit has been reduced because of its temporary and uncertain nature. In industry today, product development initiatives and research projects frequently have significantly long lead times—often up to twelve years in duration—and corporate decision makers are hesitant to factor in the Credit's benefits in light of the uncertainty over the long-term availability of the Credit.

History has shown their hesitancy is well-founded. While the Credit has been renewed six (6) times since 1981, in one instance the Credit was renewed for only six

months and on two occasions, the R&D Credit was actually allowed to expire only to be renewed retroactively. Further, adding to the frustration of American industry has been the fact that each time the Credit has been extended, its supporters have had to find revenue offsets to "pay for" the Credit which have become a permanent part of the Tax Code while the Credit remains only temporary. Supporters of the Credit feel they have had to "pay for" the Credit time and time again. This pattern of short-term extensions and lapses in the Credit followed by periods of uncertainty, reduces our ability to factor the R&D Credit into planning for long-term projects and thereby reduces the incentive value and effectiveness of the R&D Credit.

V. R&D CREDIT SHOULD BE MADE PERMANENT

The biotechnology industry provides a good illustration of the importance of permanence for the Credit. Typically, it takes up to twelve years and hundreds of millions of dollars of R&D spending to successfully develop a single new drug. Each potential drug is subject to numerous scientific and regulatory hurdles, as well as normal competitive risks before a biotech company can market a new prescription drug.

Company management faces the same dilemma over and over again. It must fund research, which like all research efforts is high-risk, over a long period of time while showing a profit to raise equity to fund the research. This requires management to keep marketing expenses, administrative expenses and non-research costs at a minimum, as well as make difficult and painful decisions on which research projects to fund and which to abandon. Given the lean budgets companies must maintain in order to remain competitive, R&D projects frequently are the swing items in the budget. Thus, management is constantly faced with the dilemma of whether it must drop some of its promising but higher risk R&D projects in order to meet financial targets. The R&D Credit is critical to companies and their long-term R&D projects and can make the marginal difference in whether a particular project is retained or abandoned. In fact, this is precisely the result Congress intended when it first enacted the R&D credit—namely that the Credit would provide the additional incentive to encourage real increases in R&D.

Mr. Chairman, that is why we need permanence. The R&D Credit can most effectively incentivize R&D projects if decisionmakers know the Credit will be there for the long run. It simply does not make sense to continue our historic pattern of temporary extensions which reduce the Credit's true incentive value and overall effectiveness.

VI. BACKGROUND ON R&D CREDIT—A GOOD INVESTMENT

The R&D Credit was originally enacted in 1981 to provide an incentive for companies to increase existing levels of R&D in the United States. The Credit was designed to encourage industry to increase R&D and applies only to increases in domestic R&D above a specified base amount.

Under the current credit, taxpayers are eligible to receive a credit equal to 20% of Qualified Research Expenditures or "QREs," in excess of a specified base amount. The current year base amount is calculated by applying a historical R&D spending-to-revenue ratio (using 1984-1988 amounts) to the taxpayer's average revenues for the preceding four years. However, the base amount can never be less than 50% of current year QRE's, which will reduce the Credit's marginal rate to 10%. This effective rate is further reduced to 6.5% because corporations must reduce their tax deduction for R&D expenses by an amount equal to the credit. These rules effectively leverage the Credit such that a U.S. taxpayer must spend $100 on QREs to receive $6.50 of R&D tax credit.

QREs are limited to domestic spending and consist primarily of salaries and wages paid for direct research, supervision and support of R&D, 65% of payments to outside contractors for R&D, certain R&D supplies, computer time sharing directly related to R&D activities, and basic research payments to universities. The Credit does not apply to other related R&D expenditures supporting R&D activities such as R&D facilities, overhead (or depreciation), computers, equipment, infrastructure, executive compensation or most employee fringe benefits. In fact, roughly one-half of a company's financial statement R&D does not qualify for the Credit thereby further limiting its effective rate. Hence, the Credit's narrow base limits abuse and will in fact apply only to direct, legitimate R&D efforts. Moreover, since the conduct of R&D is a labor intensive activity, the single biggest component of the credit base historically has been wages and salaries. These wages and salaries tend to be for engineers, scientists, researchers and their direct assistants, which generally comprise "middle-class" jobs, a critical sector of job growth in our economy. Further,

pharmaceutical developmental efforts are often conducted at university hospitals, thereby assisting the university systems.

In short, the Credit allows the private sector (rather than the government) to determine where R&D dollars are most efficiently allocated, rewards incremental R&D domestic spending, is highly leveraged, encourages middle-class job growth, and enhances the ability of U.S. companies to compete in the global marketplace.

VII. CONSIDERATION OF STRUCTURAL CHANGES TO R&D CREDIT

Mr. Chairman, as you know, there have been ongoing discussions on the various ways the Credit's current structure might be improved in order to enhance its effectiveness, such as having a rolling base period, making the Credit a flat rate with no reference to a base period, reducing the maximum fixed base percentage limitation below 16%, and eliminating the 50% minimum base rule. Alternatively, some have suggested that the current structure be retained but that taxpayers be given a right to elect at specific times to change to alternate rules.

We recognize the existing limitations on the effectiveness of the Credit for some industries. In connection with discussions concerning improvements to the Credit, we urge the Congress to consider ways in which the Credit can be made more effective. However, we do not believe that Congress should delay permanence while studying whether the Credit ought be revised. Accordingly, we believe making the Credit permanent should be the first priority.

VIII. CONCLUSION

Mr. Chairman, in closing, I again thank you for inviting me to appear before you today. I and the many other members of the R&D Credit/Section 861 Coalition look forward to working with you and the other members of the Subcommittee in achieving permanence for the R&D Credit.

PREPARED STATEMENT OF ROBERT S. GREGG

Mr. Chairman and Members of the Subcommittee. My name is Bob Gregg. I am the Senior Vice-President of Finance & Legal, Treasurer and Chief Financial Officer of Sequent Computer Systems. Sequent Computer Systems is based in Beaverton, Oregon, and is a leading architect of enterprise information technology solutions. In 1994, Sequent had approximately 1800 employees worldwide, with approximately half of our total revenue coming from sales outside the U.S. from the production of products within the U.S.

I am testifying today on behalf of the American Electronics Association ("AEA")—an organization that represents some 3,000 U.S. technology companies based in 44 states and which contributes to over 2 million jobs in the United States. More than 70 percent of AEA members employ less than 200 people. AEA's companies, which range from small start-ups to the Fortune 500, span the breadth of the electronics industry, from silicon to software, to all levels of computers, communications networks, and systems integration have made making the R&D credit permanent a top priority for AEA.

I want to thank this Subcommittee for providing me this opportunity to testify today regarding the importance to the U.S. high technology industry of a permanent R&D credit. As an Oregon based company, I would also like to express special thanks to Senator Packwood for his long-time support of the R&D credit as well as his efforts in trying to address a technical glitch in the R&D credit definition of start-up companies. This glitch severely impacts Sequent and has resulted in our receiving no credit since the credit structure was changed in 1989, even though our research expenditures have increased over 700 percent since the inception of the company and have contributed to the employment of over 300 highly skilled engineers in Oregon, and over 600 technically skilled support personnel.

Sequent was founded in 1983 by 18 former Intel employees with a vision of the future and with the innovative spirit that the R&D credit was designed to encourage. As a result of our successful R&D efforts in the middle 1980's, Sequent has grown from being a start-up company just over 10 years ago to the mid-sized company that it is today. Our success is largely due to the research and development undertaken by Sequent to design and manufacture a new generation of large commercial computer systems (which have come to be known as symmetric multi-processing computers).

Before the structure of the credit was changed in 1989 and the start-up definition was written in such a way as to exclude certain start-up companies, the R&D credit was very important to Sequent even though we couldn't currently use any of the

credit dollars we were entitled to because we had net operating losses, as many small companies in our position do. The credit was very important to us, nonetheless, because it reduced our effective tax rate for book accounting purposes, which in turn reduced our cost of capital. As a result, I believe that it worked as an incentive to get Sequent to spend more on R&D.

I would like to address two topics in my testimony today. First, since making the R&D credit is a top priority for the AEA, I will address the reasons why we believe strongly that a permanent R&D credit would be an important public policy tool that would result in keeping good paying, highly skilled jobs in the U.S. Second, I will address the need for a technical correction of the glitch that we call the "notch baby issue" that impacts Sequent. With this correction, Sequent also believes that the R&D credit should be made permanent.

I. THE IMPORTANCE OF A STABLE R&D TAX CREDIT

Research & Development leads to advances in scientific and technical knowledge, which in turn leads to productivity improvements and long-term economic growth. Private companies cannot capture all of the "spill-over" economic and social benefits resulting from their investment in R&D. Private companies will therefore under invest in R&D without an outside stimulus—such as that provided by the R&D tax credit.

According to a 1992 study by economists Baily and Lawrence, the ratio of R&D spending to output rose over 40 percent in the 1980's when the R&D tax credit was in effect for the longest period of time. The growth in R&D spending during this period was directly correlated to the value of the R&D credit, with the growth rates decreasing as Congress cut back on the value of the credit.

A permanent R&D credit will generate even more investment in R&D than that generated by temporary extensions because corporations will be able to rely upon the continued availability of the credit when making long term R&D investment decisions. As the 1994 study by the KPMG Peat Marwick economics group indicates "a one-dollar reduction in the after-tax price of R&D stimulates approximately one dollar of additional private R&D spending in the short run, and about two dollars of additional R&D in the long run."

The real benefit from a public policy perspective is that the R&D credit stimulates increased research investment at the margin. Because all companies have limited R&D budgets, marginal projects are most likely to be cut. The R&D credit provides marginal funding to encourage companies to engage in more R&D projects than they could otherwise afford. Those projects at the margin in a company's R&D budget are generally those involving greater risks with longer term potential rewards.

Moreover, the R&D credit promotes a range of highly skilled, high-paying U.S jobs. The R&D credit is primarily based on salaries paid to individuals engaged in direct research, direct supervision of such research or direct support of such research. In addition, the credit only applies to research conducted in the United States. A permanent R&D credit, therefore, will provide added incentive for America's youth to obtain the skills necessary to pursue skilled, high-wage careers in R&D. Accordingly, for all of these reasons, the AEA strongly advocates a permanent extension of the R&D credit. I will now address the technical glitch that needs to be corrected so that start-up companies like Sequent can utilize the credit.

II. THE TECHNICAL GLITCH AFFECTING START-UP COMPANIES LIKE SEQUENT

Under the current credit, only qualified research expenses over a fixed base amount are eligible for the credit. In 1989 the base calculation was changed so that the base is now computed by multiplying the ratio of a company's qualified research expenses to gross receipts for 1984-1988 by the company's average gross receipts in the prior four years.

Recognizing that companies in a start-up phase will experience a distorted relationship between research expenses and gross receipts in their initial years of operation, Congress provided a special fixed base for start-up companies. Specifically, under those rules a start-up company is defined as any company with fewer than 3 years of both gross receipts and qualified research expenses during the base period (1984-1988).

The problem with this three out of five year test is that it necessarily misses any company that began during the early years of the base period, as contrasted with those starting in the later years of that period or thereafter. Indeed, any successful company that starts selling or starts R&D in the early years of that period would not have stopped R&D spending or sales during the later years of that period. As such, any company with its first year of both gross receipts and R&D falling in 1984, 1985 or 1986, will not be considered to be a start-up even though its R&D

to sales ratio could have been well beyond 100% during many of the base years. We understand from those involved in putting the provision together in 1989 that this result was never intended.

Sequent is a perfect example of the unfairness exacted by this rule. Like many companies in the early 1980's, Sequent was funded by venture capital. This initial capital allowed the founders of the company nearly two years to develop a marketable product without the immediate need to generate revenue to cover operating costs. As a result, in these early years of operations, the Company's R&D as a percentage of sales was extremely high, in some years, well over 100%.

Sequent incurred its first year of research costs in 1983 and its first year of gross receipts in 1984. As a result, our fixed base percentage is so high that for all of the foreseeable future we will not receive any R&D credit. Yet our history and our R&D to sales ratio show that we were clearly in a start-up phase and thus, were the type of company Congress intended to include in future credit eligibility.

Without This Change The Credit's Incentive Value is Zero For Companies Like Sequent: We agree that the best policy goal of the credit should be to cause companies to spend more on R&D than they otherwise would without the credit. This increased R&D effort is beneficial to society because companies will be better able to bring new and more efficient technologies to society. In Sequent's case however, the credit doesn't work because of the technical glitch. Unless this glitch is rectified, we will simply never get any R&D credit.

The Credit Actually Puts Sequent At a Competitive Disadvantage Vis-a-Vis its Competitors: More importantly, the current start-up company definition puts Sequent at a significant disadvantage when we try to compete with an already established company, or a new company. Either of these companies will get a 20% incentive for the extra R&D they spend in developing that next generation of product. We, in contrast, will get no help.

The high technology industry has evolved and changed over the 10 years since Sequent began business. The one over-riding main stay in surviving in the market place is having a competitive edge. Without an R&D credit, Sequent will be at a distinct disadvantage against our competitors due to our misfortune of having our first year of sales and R&D fall in 1984, rather than 1987 or beyond.

Proposal: The proposal that solves this problem is very simple. *It would change the definition of a start-up company to include any company with its first year of both R&D and sales in 1984 or thereafter.* Based on a revenue estimate given on this proposal when it was included in H.R. 11 in 1992—a bill that was vetoed by President Bush for reasons unrelated to this issue—the cost over 5 years would have been under $50 million. I would expect that the cost would be similar today. On behalf of the AEA as well as Sequent, I hope that you will seriously consider both making the credit permanent and fixing this problem, whether through a technical correction or in other R&D credit legislation.

III. CONCLUSION

Technological change is directly or indirectly responsible for at least two-thirds of U.S. productivity growth since the Great Depression. During this time, the U.S. has become increasingly reliant on technology-based production. AEA believes that America cannot remain complacent; technology prowess in the past does not assure technology success in the future. U.S. technological dominance is no longer unassailable. We must encourage—through a permanent R&D credit—further development of tomorrow's technologies and industries.

Sequent is a perfect example of an innovative, leading edge technology company doing business in this rapidly changing market place in an industry where having a competitive advantage can mean the difference between success and failure. We ask that you acknowledge the oversight I have explained in the 1989 tax legislation with respect to the start-up definition and ask for your support in making this technical correction as well as in making the R&D credit permanent.

I would be happy to answer any questions you may have.

PRESENT LAW AND BACKGROUND RELATING TO THE RESEARCH AND EXPERIMENTATION TAX CREDIT

Scheduled for a Hearing

Before the

SUBCOMMITTEE ON TAXATION AND IRS OVERSIGHT

of the

SENATE COMMITTEE ON FINANCE

on April 3, 1995

Prepared by the Staff

of the

JOINT COMMITTEE ON TAXATION

March 31, 1995

JCX-20-95

INTRODUCTION

The Subcommittee on Taxation and Internal Revenue Service (IRS) Oversight of the Senate Committee on Finance has scheduled a hearing on April 3, 1995, on the research and experimentation ("R&E") tax credit. The R&E tax credit, which was enacted in 1981 and extended several times since, is currently scheduled to expire after June 30, 1995.

This document,[1] prepared by the staff of the Joint Committee on Taxation, provides a description of present-law tax rules (Part I) and legislative background of the R&E tax credit (Part II).

I. PRESENT LAW

General rule

Section 41 of the Internal Revenue Code provides for a research tax credit equal to 20 percent of the amount by which a taxpayer's qualified research expenditures for a taxable year exceed its base amount for that year. The research tax credit is scheduled to expire such that it will not apply to amounts paid or incurred after June 30, 1995.

A 20-percent research tax credit also applies to the excess of (1) 100 percent of corporate cash expenditures (including grants or contributions) paid for basic research conducted by universities (and certain nonprofit scientific research organizations) over (2) the sum of (a) the greater of two minimum basic research floors plus (b) an amount reflecting any decrease in nonresearch giving to universities by the corporation as compared to such giving during a fixed-base period, as adjusted for inflation. This separate credit computation is commonly referred to as the "university basic research credit" (see sec. 41(e)).

Computation of allowable credit

Except for certain university basic research payments made by corporations, the research tax credit applies only to the extent that the taxpayer's qualified research expenditures for the current taxable year exceed its base amount. The base amount for the current year generally is computed by multiplying the taxpayer's "fixed-base percentage" by the average amount of the taxpayer's gross receipts for the four preceding years. If a taxpayer both incurred qualified research expenditures and had gross receipts during each of at least three years from 1984 through 1988, then its "fixed-base percentage" is the ratio that its total qualified research expenditures for the 1984-1988 period bears to its total gross receipts for that period (subject to a maximum ratio of .16). All other taxpayers (so-called "start-up firms") are assigned a fixed-base percentage of .03.[2]

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[1] This document may be cited as follows: Present Law and Background Relating to the Research and Experimentation Tax Credit (JCX-20-95), March 31, 1995.

[2] The Omnibus Budget Reconciliation Act of 1993 included a special rule designed to gradually recompute a start-up firm's fixed-base percentage based on its actual research experience. Under this special rule, a start-up firm (i.e., any taxpayer that did not have gross receipts in at least three years during the 1984-1988 period) will be assigned a fixed base percentage of .03 for each of its first five taxable years after 1993 in which it incurs qualified research expenditures. In the event that the research credit is extended beyond the scheduled June 30, 1995 expiration date, a start-up firm's fixed-base percentage for its sixth through tenth taxable years after 1993 in which it incurs qualified research expenditures will be a phased-in ratio based on its actual research experience. For all subsequent taxable years, the taxpayer's fixed-base percentage will be its actual ratio of qualified research expenditures to gross receipts for any five years selected by the taxpayer from its fifth through tenth taxable years (sec. 41(c)(3)(B)).

In computing the credit, a taxpayer's base amount may not be less than 50 percent of its current-year qualified research expenditures.

Eligible expenditures

Qualified research expenditures eligible for the research tax credit consist of: (1) "in-house" expenses of the taxpayer for wages and supplies attributable to qualified research; (2) certain time-sharing costs for computer use in qualified research; and (3) 65 percent of amounts paid by the taxpayer for qualified research conducted on the taxpayer's behalf (so-called "contract research expenses").

To be eligible for the credit, the research must not only satisfy the requirements of present-law section 174 but must be undertaken for the purpose of discovering information that is technological in nature, the application of which is intended to be useful in the development of a new or improved business component of the taxpayer, and must pertain to functional aspects, performance, reliability, or quality of a business component. Research does not qualify for the credit if substantially all of the activities relate to style, taste, cosmetic, or seasonal design factors (sec. 41(d)(3)). In addition, research does not qualify for the credit if conducted after the beginning of commercial production of the business component, if related to the adaptation of an existing business component to a particular customer's requirements, if related to the duplication of an existing business component from a physical examination of the component itself or certain other information, or if related to certain efficiency surveys, market research or development, or routine quality control (sec. 41(d)(4)).

Expenditures attributable to research that is conducted outside the United States do not enter into the credit computation. In addition, the credit is not available for research in the social sciences, arts, or humanities, nor is it available for research to the extent funded by any grant, contract, or otherwise by another person (or governmental entity).

Relation to deduction

Deductions for expenditures allowed to a taxpayer under section 174 (or any other section) are reduced by an amount equal to 100 percent of the taxpayer's research tax credit determined for the taxable year. Taxpayers may alternatively elect to claim a reduced research tax credit amount under section 41 in lieu of reducing deductions otherwise allowed (sec. 280C(c)(3)).

II. LEGISLATIVE BACKGROUND

The research tax credit initially was enacted in the Economic Recovery Tax Act of 1981 as a credit equal to 25 percent of the excess of qualified research expenses incurred in the current taxable year over the average of qualified research expenses incurred in the prior three taxable years. The research tax credit was modified in the Tax Reform Act of 1986, which (1) extended the credit through December 31, 1988, (2) reduced the credit rate to 20 percent, (3) tightened the definition of qualified research expenses eligible for the credit, and (4) enacted the separate, university basic research credit.

The Technical and Miscellaneous Revenue Act of 1988 ("1988 Act") extended the research tax credit for one additional year, through December 31, 1989. The 1988 Act also reduced the deduction allowed under section 174 (or any other section) for qualified research expenses by an amount equal to 50 percent of the research tax credit determined for the year.

The Omnibus Budget Reconciliation Act of 1989 ("1989 Act") effectively extended the research credit for nine months (by prorating qualified expenses incurred before January 1, 1991). The 1989 Act also modified the method for calculating a taxpayer's base amount (i.e., by substituting the present-law method which uses a fixed-base percentage for the prior-law moving base which was calculated by reference to the taxpayer's average research expenses incurred in the preceding three taxable years). The 1989 Act further reduced the deduction allowed under section 174 (or any other section) for qualified research expenses by an amount equal to 100 percent of the research tax credit determined for the year.

The Omnibus Budget Reconciliation Act of 1990 extended the research tax 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 extended the research tax credit for six months (i.e., for qualified expenses incurred through June 30, 1992).[3]

The Omnibus Budget Reconciliation Act of 1993 ("1993 Act") extended the research tax credit for three years -- i.e., retroactively from July 1, 1992 through June 30, 1995. The 1993 Act also provided a special rule for start-up firms, so that the fixed-base ratio of such firms eventually will be computed by reference to their actual research experience (see

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[3] For an analysis of the issues presented by the extensions and modifications of the research tax credit, see Joint Committee on Taxation, Description and Analysis of Tax Provisions Expiring in 1992 (JCS-2-92), at 60-68.

footnote 2 supra).[4] The three-year extension of the research tax credit provided for by the 1993 Act was estimated by the Joint Committee on Taxation to reduce Federal Government receipts by $4.851 billion during the 1994-1998 fiscal year period.

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[4] The 1993 Act also provided a temporary rule for allocation of research expenses between U.S. and foreign income. The 1993 Act rule generally is identical to temporary rules in effect prior to the enactment of the 1993 Act for allocating research expenses, except that the percentage of U.S.-incurred research expenses allocated to U.S. source income (and the percentage of foreign-incurred research expenses allocated to foreign source income) is 50 instead of 64. The 1993 Act provision applies to the taxpayer's first taxable year (beginning on or before August 1, 1994) beginning immediately after the taxpayer's last taxable year to which Revenue Procedure 92-56 applies, or would have applied had the taxpayer elected the benefits of the Revenue Procedure (which generally applied to a taxpayer's first two taxable years beginning after August 1, 1991).

PREPARED STATEMENT OF CLIFF SIMPSON

Mr. Chairman and members of the Subcommittee, my name is Cliff Simpson, and I am the Vice President of Tax, Export and Audit for Novell, Inc. In that capacity, I oversee the company's activities related to all areas of taxation, export policy and internal audit. I thank you for the opportunity to testify before your Subcommittee today on the importance of making permanent the research and development (R&D) tax credit. I want to commend you, Mr. Chairman, for holding hearings on the need to permanently extend the R&D credit, and for your leadership—along with Senator Baucus—in introducing S. 351, a bill to permanently extend the credit. When you introduced S. 351 you stated that a permanent R&D tax credit must be the cornerstone of any long-term program for economic growth. I could not agree with you more. Accordingly, I hope that your bill becomes part of the tax legislation moving through Congress this year and is enacted into law.

I am testifying today on behalf of the Working Group on Research and Development, a broad-based coalition of companies from a variety of industries jointly seeking the permanent extension of the R&D tax credit. Representative industries include computer hardware and software, telecommunications, biotechnology, pharmaceutical and electronics.

I am also appearing in my capacity as Vice President of Taxation of Novell, Inc. Novell is an operating system software company and developer of industry-leading network services and application software. Our growth has taken us from 14 employees in 1983 to more than 7,900 today. Approximately thirty-five percent of our total number of employees are directly involved in R&D. We maintain offices in more than 40 cities in North America. Around the world we have country subsidiaries from Germany, France and the U.K. to Australia. In Japan, we are the majority partner in Novell Japan, Ltd., a joint venture with Cannon, Fujitsu, NEC, Sony, Softbank and Toshiba.

R&D TAX CREDIT LEGISLATIVE HISTORY

The R&D credit was enacted in 1981 to provide an incentive for companies to increase their U.S. R&D activities. As originally passed, the R&D credit was to expire at the end of 1985. Recognizing the importance and effectiveness of the provision, Congress did not let it expire. In fact, since 1981 the credit has been extended six times. In addition, the credit's focus has been sharpened by limiting both qualifying activities and eligible expenditures, and altering its computational mechanics. The credit has been the focus of significant legislative activity and has undergone refinement many times since its inception.

In 1986, the credit lapsed, but was retroactively extended and the rate cut from 25 to 20 percent. In 1988, the credit was extended for one year. However, the credit's effectiveness was reduced by decreasing the deduction for R&D expenditures by 50% of the credit. In 1989, Congress extended the credit for another year and made changes that were intended to increase the incentive effect for established as well as start-up companies. In the 1990 Budget Reconciliation Act, the credit was ex-

tended again for 15 months through the end of 1991. The credit was extended through June 30, 1992, by the Tax Extension Act of 1991. Finally, in OBRA 1993, the credit was retroactively extended through June 30, 1995—its current expiration date.

According to the Tax Reform Act of 1986, the R&D credit was originally limited to a five-year term in order "to enable the Congress to evaluate the operation of the credit." While it is understandable that the Congress would want initially to adopt the credit on a trial basis, the credit has proven to be effective and such a stance is no longer necessary.

This pattern of temporarily extending the credit has reduced the incentive effect of the credit. The U.S. research community needs a stable, consistent R&D policy in order to optimize its contribution to the nation's economic growth and sustain the basis for ongoing technology competitiveness in the global arena.

WHY DO WE NEED AN R&D TAX CREDIT?

Credit offsets the tendency for underinvestment in R&D

The single biggest factor behind productivity growth is innovation. Two-thirds to 80% of productivity growth since the Great Depression is attributable to innovation. In an industrialized society R&D is the primary means by which technological innovation is generated.

Firms can not capture fully the rewards of their innovation because the rate of return to society from innovation is twice that which accrues to the individual company. This situation is aggravated by the high risk associated with R&D expenditures. Eighty percent of such projects are believed to be economic failures.

Therefore, economists and technicians who have studied the issue are nearly unanimous that the government should intervene to bolster R&D. The most recent study, *Extending the R&D Credit: The Importance of Permanence (November 1994),* conducted by the Policy Economics Group of KPMG Peat Marwick, concludes that " . . . [A] tax credit for research and experimentation was enacted with the goal of offsetting the tendency to underinvest in industrial research. The R&E tax credit has been an effective—and cost-effective—tool for stimulating private R&D activity"

The credit helps U.S. businesses remain competitive in a world marketplace

The R&D credit has played a significant role in placing American businesses ahead of their international competition in developing and marketing new products. It has assisted in the development of new and innovative products; providing technological advancement, more and better U.S. jobs, and increased domestic productivity and economic growth. This is increasingly true in our knowledge- and information-driven world marketplace.

Research and development must meet the pace of competition. In many instances, the life-cycle of new products is continually shrinking. As a result, the pressure of getting a product to market is intense. Without robust R&D incentives encouraging these efforts, the ability to compete in world markets is diminished.

Continued private sector R&D is critical to the technological innovation and productivity advances that will maintain U.S. leadership in the world marketplace. Foreign governments are competing intensely for U.S. research investments by offering tax and other financial incentives. Since 1981, when the credit was first adopted, there have been dramatic gains in R&D spending. However other countries also offer incentives for R&D and U.S. firms spend only one-third as much as their German counterparts on R&D, and only about two-thirds as much as Japanese firms.

We can no longer assume that American companies will automatically choose to site their R&D function in the U.S. Congress, and the Administration, must make a strong and permanent commitment to attracting and retaining R&D investment in the United States. The best way to do that is by permanently extending the existing R&D tax credit.

The credit provides a targeted incentive for additional R&D investment, increasing the amount of capital available for innovative and risky ventures

The R&D credit reduces the cost of capital for businesses which increase their R&D spending, thus increasing capital available for these risky ventures.

Products resulting from R&D must be weighed for their financial viability. Market factors are providing increasing incentives for controlling the costs of business, including R&D. Based on the cost of R&D, the threshold for acceptable risk either rises or falls. By reducing the costs of R&D, you make it possible to increase R&D efforts. In most situations, the greater the scope of R&D activities, or risk, the greater the potential for return to investors, employees and the public at large.

The R&D tax credit is a vital tool in keeping U.S. industry competitive because it frees-up capital to invest in leading edge technology and innovation. It makes available additional financial resources to companies seeking to accelerate research efforts. It lowers the economic risk to companies seeking to initiate new research, which will potentially lead to enhanced productivity and overall economic growth.

Private industrial R&D spending is very responsive to the R&D credit, making the credit a cost effective tool to encourage economic growth

The KPMG Peat Marwick 1994 study, referenced above, concludes that a one-dollar reduction in the after-tax price of R&D stimulates approximately one dollar of additional private R&D spending in the short-run, and about two dollars of additional R&D in the long-run. That, in turn, implies long-run gain in GDP. The study states, "The credit has been a public policy success . . . The best available evidence now indicates that the increase in R&D due to the tax credit equal or exceed the credit's revenue cost."

Research and Development is About Jobs and People

Investment in R&D is ultimately an investment in people, their education, their jobs, their economic security, their standard of living. Dollars spent on R&D are primarily spent as salaries for engineers, researchers and technicians.

When taken to market as new products, incentives that support R&D translate to salaries of employees in manufacturing, administration and sales. Of exceptional importance to Novell and the rest of the electronics industry, R&D success also means salaries to people in our distribution channels who bring our products to our customers, as well as service providers and developers of complementary products. And, our customers ultimately drive the entire process by the value they put on the benefit of advances in technology. Benefits that often times translate into their ability to compete. By making other industries more competitive, research within the electronics industry contributes to preserving and creating jobs across our entire economy.

My experience has been that more than 75 percent of expenses qualifying for the R&D credit go to salaries for researchers and technicians, providing high-skilled, high wage jobs to U.S. workers. Investment in R&D, in people working to develop new ideas, is one of the most effective strategies for economic growth and competitive vitality.

The R&D credit is a market-driven incentive

The R&D credit is a meaningful, market-driven way to encourage private sector investment in research and development expenditures. Any taxpayer that increases their R&D spending and meets the technical requirements provided in the law can qualify for the incentive. Instead of relying on government-directed and controlled R&D spending, businesses of all sizes, and in all industries, can best determine what types of products and technology to invest in so that they could ensure American business remains competitive in the world marketplace.

THE R&D CREDIT SHOULD BE MADE PERMANENT TO HAVE OPTIMUM INCENTIVE EFFECT

Research projects cannot be turned off and on like a light switch. If corporate managers are going to take the benefits of the R&D credit into account in planning future research projects, they need to know that the credit will be there when the research is performed. Research projects have long horizons and long gestation periods. Furthermore, firms generally face longer lags in adjusting their R&D investments compared, for example, to adjusting their investments in physical capital.

In order to increase their R&D efforts, businesses must search for and hire scientists, engineers and support staff. They must often invest in new physical plant and equipment. There is little doubt that a portion of the incentive effect of the credit has been lost over the past thirteen years as a result of the constant uncertainty over the continued availability of the credit.

The KPMG Peat Marwick 1994 study, referenced above, concluded that permanence is necessary to realize the full effectiveness of the R&D credit. The study concludes that "if the credit were to be made permanent and less subject to occasional structural modification, its cost-effectiveness would be further increased."

If the credit is to provide an effective incentive for increased R&D activity, the practice of periodically extending the credit for short periods must be eliminated, and the credit must be made permanent. Only then will the full potential of its incentive effect be felt across all the sectors of our economy.

CONCLUSION

Making the existing R&D credit permanent best serves the country's long term economic interests as it will eliminate the uncertainty over the credit's future and allow R&D performing businesses to make important long-term business decisions regarding research spending and investment. Private sector R&D stimulates investment in innovative products and processes that greatly contribute to overall economic growth, increased productivity, new and better U.S. jobs, and higher standards of living in the United States. Moreover, by creating an environment favorable to private sector R&D investment, jobs will remain in the United States. Investment in R&D is an investment in people. A permanent R&D tax credit is essential for the United States economy in order for its industries to compete globally as international competitors have chosen to offer direct financial subsidies and reduced capital cost incentives to "key" industries.

Finally, you will undoubtedly hear today from other witnesses about certain ways in which the current R&D credit can be improved and expanded. Policy makers may wish to consider ways in which to enhance the credit's incentive effect and expand its utilization. While such enhancements may warrant attention, the current R&D credit has withstood the test of time and has been subject to significant legislative and private sector scrutiny and evaluation. Studies have confirmed its cost effectiveness and its ability to create incentives for additional U.S. conducted R&D. I sincerely hope any discussions of improvement will not delay immediate action on permanently extending the existing credit. The most important thing Congress can do to provide an environment that encourages continued U.S. technological advancement and leadership is to underscore the federal government's commitment to world economic leadership by finally making permanent the existing R&D credit. It is an example of a good program—that is working.

Thank you again, Mr. Chairman, for the opportunity to offer my testimony before this Committee. I would be happy to answer any questions you or other members of the Subcommittee would like to ask.

PREPARED STATEMENT OF LINDEN C. SMITH

Good morning, my name is Lin Smith. I am a Managing Director at Barents Group LLC, a wholly owned subsidiary of KPMG Peat Marwick LLP. I direct the Firm's practice in performing economic and revenue estimating studies of tax policy changes considered by the federal government. I am pleased to appear before the subcommittee this morning to discuss the importance of not only extending the research and experimentation credit before it expires on June 30 of this year, but also to discuss the importance of making the credit permanent. While there have been a number of legitimate concerns raised regarding a possible restructuring of the credit to make it more effective for certain taxpayers, there is as yet no consensus on how such a restructuring might be developed within likely revenue constraints. On the other hand, it is also clear that the credit is now generally regarded as an effective means of stimulating domestic R&D spending.

In addition, it is also generally recognized that any tax incentive that is designed to encourage long-run investment plans will be more effective where taxpayers have some certainty regarding is continued availability. Perhaps the single most important reason why the credit has not been made permanent to date has nothing to do with the effectiveness of the credit or the possible need for restructuring. Rather, the key issue is revenue. A permanent extension of the credit may cost roughly $8 billion over the next 5 fiscal years. However, assuming the Congress will otherwise continue to temporarily extend the credit on a short-term basis, no net revenue is actually saved. Instead, the credit is simply made less efficient. That is, investors do not fully trust that the credit will always be available. As a result, this uncertainty is likely to lead investors to demand higher rates of return on their R&D investments than would be necessary with a permanent credit. Consequently, the periodic short-term extensions themselves impose a cost in the form of reducing the credit's effectiveness.

I would now like to very briefly discuss a few of the key findings in a report we prepared last fall for the Working Group on Research and Development.[1] In brief, these are:

- R&D is important to the Nation's long-term economic growth.
- There is a tendency for the private sector to under-invest in R&D.

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[1] "Extending the R&E Tax Credit: The Importance of Permanence," Policy Economics Groups, KPMG Peat Marwick LLP, November 1994.

- R&D growth has been sluggish in recent years and is lagging behind that of some of our major international competitors.
- Evidence collected over the past several years has shown the credit to be quite effective in stimulating increased R&D spending.
- Economic and financial theory suggests that the credit can be made more effective if permanently extended.

R&D is Important to Long-Run Economic Growth: Advances in scientific and technical knowledge are important factors explaining improvements in productivity and long-run economic growth. Innovations resulting from successful research and development (R&D) increase productivity, which contributes to increasing wages and standards of living. Movements over time in real total compensation per hour are strongly correlated with movements in productivity, and numerous economic studies over the past 20 years have documented a strong link between R&D and productivity growth.

There is a Tendency to Under-invest in R&D: The benefits of R&D are not fully reflected in private rates of return, which leads to under-investment in research. Social rates of return to R&D investments are typically about twice as high on average as private rates of return. Examples of the private and social rates of return to R&D for five research-intensive industries are given in Table 1. Documented cases of a particular industry or innovation for which the social rate of return to R&D was less than the private rate of return are rare. The difference between the two rates of return represents the benefits to innovation that the innovator is unable to capture—typically referred to as a spillover effect: companies can often piggyback on the R&D successes of others by copying their products and production processes. The resulting competition drives down prices, which pushes the private rates of return below the social rates of return. Similarly, cost-reducing innovations in one company or industry can lead to cost reductions in other companies or industries. The existence of such spillovers implies that there is a tendency to under-invest in industrial R&D. This is the fundamental justification for government intervention in the R&D market: a tax credit for R&D lowers the cost of private R&D investment, and helps to bring such investment up toward the socially desirable level.

The computer and semiconductor industries abound with examples of spillovers. The development by one manufacturer of a faster and more powerful microprocessor quickly leads to imitation by other manufacturers. Similarly, the development by one wordprocessor software company of a handy new feature—such as graphics capabilities or little buttons that automate complicated tasks—quickly leads to imitation by competitors. A similar process occurs in the pharmaceutical industry. This imitation cuts down the time period over which the original innovators can earn a return to their inventions. There are other broader kinds of spillovers, as well. The availability of increasingly inexpensive, powerful and user-friendly computers has had a broad impact on most industries—both high- and low-tech. There are a host of other more mundane innovations that have had a broad impact on society in excess of the returns to their inventors: hybridized fruits and vegetables that reduce demands on the water supply and reduce the need for pesticides; new kinds of thread that reduce the cost of textile manufacturing; new metal alloys that make cars and bicycles lighter and faster; and so on.

Table 1: Estimated Rates of Return to R&D Investments

Industry	Private Rate of Return	Social Rate of Return
Chemicals	13.3%	29.1%
Non-electrical machinery	24.0%	45.0%
Electrical products	22.4%	30.2%
Transportation equipment	11.9%	16.3%
Scientific instruments	16.1%	128.9%

Source: Jeffrey I. Bernstein and M. Ishaq Nadiri, "Interindustry R&D Spillovers, Rates of Return, and Production in High-Tech Industries," *American Economic Review Papers and Proceedings*, May 1988.

U.S. R&D Growth is Sluggish and is Lagging Our Competitors: The U.S. has not been faring well against its main competitors in terms of R&D effort. By virtue of its sheer size, the U.S. still dominates its major competitors in terms of total dollars spent on R&D. However, recent national and international trends in R&D spending show cause for concern about our continued competitiveness in research and development. First, the growth in real U.S. non-defense R&D spending has stagnated in recent years, as shown in Figure 1. The total and non-defense R&D spending growth rates are summarized in Table 2. This R&D slowdown is not due

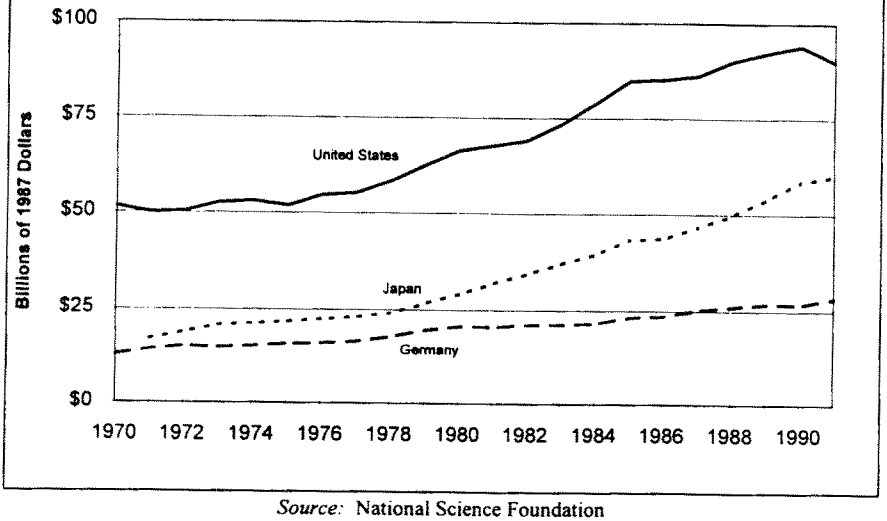
solely to the drop in federal R&D spending: real *industry-funded* R&D has shown slower growth in recent years. This is illustrated in Figure 2, which shows total U.S. R&D spending as a percentage of GDP, broken down by source of funds. Second, the U.S. is falling increasingly behind both Japan and Germany in terms of non-defense R&D intensity (R&D as a percentage of GDP). This trend is shown in Figure 3. In 1991, the most recent international data that we have, the U.S. spent 1.9 percent of its GDP on non-defense R&D, compared to 2.7 percent for Germany and 3.0 percent for Japan. The U.S. is gradually falling further behind: U.S. R&D intensity has remained flat since 1986, while that of Japan and Germany has continued to rise. The U.S. remains even with France (1.9 percent) and ahead of the UK (1.7), Italy (1.3), and Canada (1.4).

Table 2: Growth Rates of U.S. R&D and GDP, 1970-1991

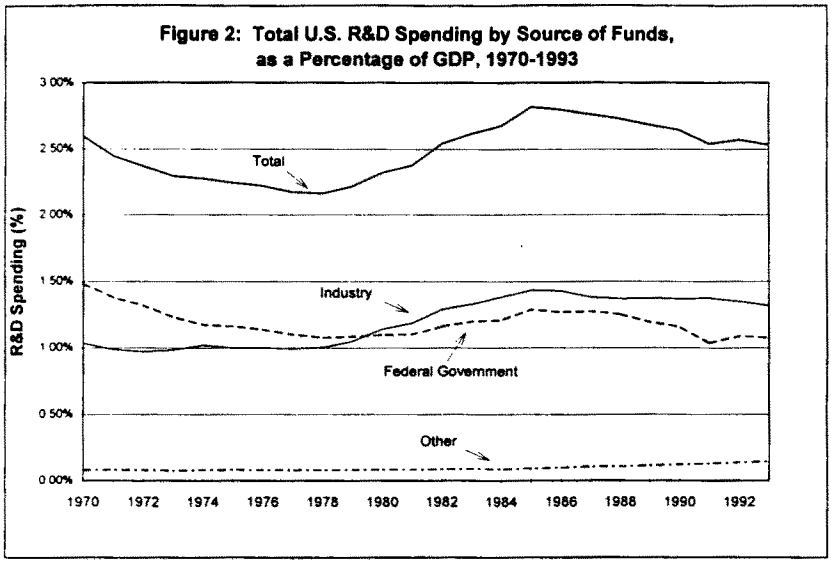
	1970-1980	1981-1990	1981-1985	1986-1990
Total R&D Growth Rate	1.6%	3.9%	6.5%	1.4%
Non-Defense R&D Growth Rate	2.5%	3.5%	4.9%	2.1%
GDP Growth Rate	2.5%	2.6%	2.5%	2.6%

Source: National Science Foundation.

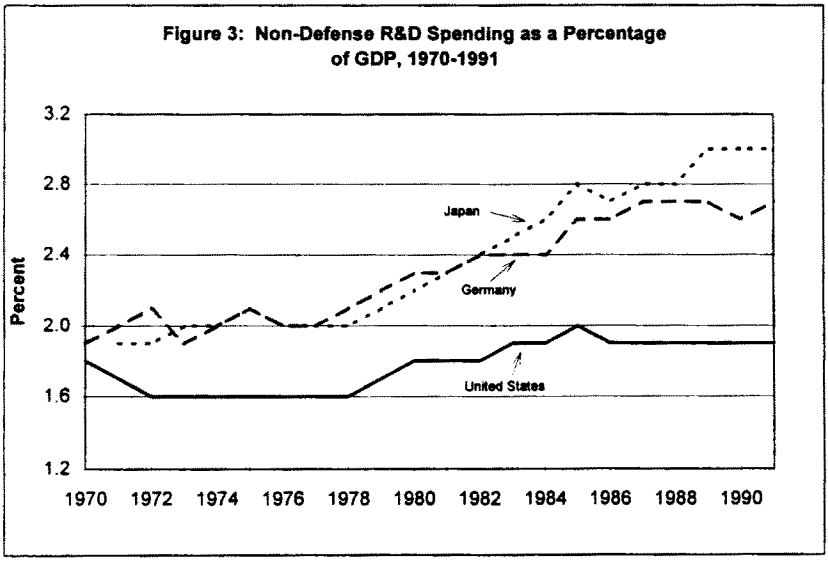
Figure 1: Constant-Dollar Non-Defense R&D Spending, 1970-1991



Source: National Science Foundation



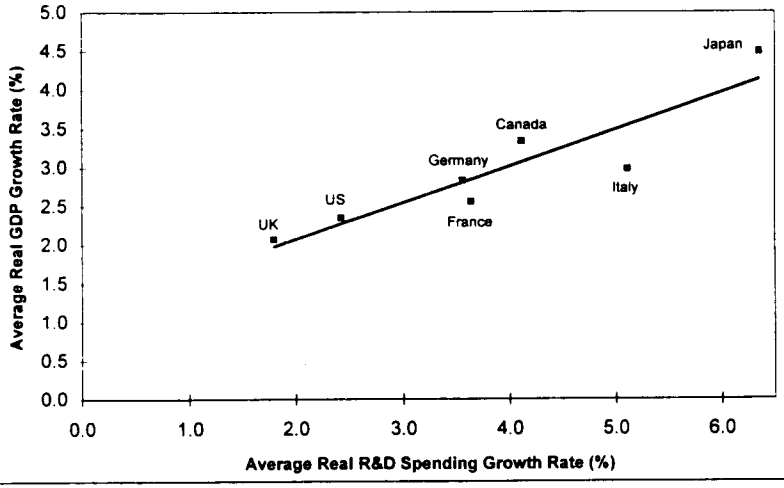
Source: National Science Foundation



Source: National Science Foundation

The importance of R&D to economic growth is illustrated in Figure 4: Across countries, faster growth in national R&D spending is associated with faster growth in GDP. While this diagram by itself does not demonstrate causation, several economic studies have concluded that measures of innovation are important factors explaining the differences in economic growth among countries.

Figure 4: Total R&D Spending Growth Versus GDP Growth, 1970-1991



Source: National Science Foundation

The R&E Tax Credit Has Been Quite Effective: The R&E tax credit has been shown to be effective in compensating for the potential to under-invest in research. Several recent studies have documented the credit's effectiveness. On average, it increases R&D investment by approximately $1 for each $1 of credit in the short run, and by as much as $2 over the longer run. This evidence stands in sharp contrast to the information available in 1989, when the R&E credit underwent its last major review. As summarized in the GAO's 1989 report on the credit, early studies from the first few years of the R&E credit indicated that one dollar of foregone tax revenues only stimulated between 15 and 36 cents of additional research spending. These early studies were rather limited in that they only had available a short timespan of data to examine. They were further limited in that they did not take complete account of the interactions of the credit with other provisions of the corporate tax code. The most recent studies cover the first ten years of the credit's history and are more credible on a technical level. They indicate that the additional research spending stimulated by the credit equals or exceeds its revenue cost.

The R&E Credit Should Be Made Permanent: Making the R&E credit permanent is justified. Permanence is necessary to realize the full potential effectiveness of the R&E credit. Its effectiveness will be further enhanced if the continual uncertainty regarding its future is removed. It is important to realize that R&D funding decisions involve consideration of the long-term costs and benefits of multi-year research projects. Research plans have long horizons and long gestation periods. They are also generally risky investments—all the more so because of their long-term nature. Furthermore, firms appear to face longer lags in adjusting their R&D plans compared, for example, to adjusting their investments in physical capital. In the pharmaceutical and biotechnology industries, the duration of the research process itself is compounded by the lengthy process of clinical trials and FDA approval. For highly competitive industries such as computer software, electronics and semiconductors, the effects of long gestation on the R&D decision process may be compounded by relatively short pay-back periods: new products can quickly become obsolete, or must be continually improved through an on-going research program. In addition, there is some evidence in studies of the credit's effectiveness indicating

lags of several years in the adjustment of companies to R&D tax incentives. This lag appears mainly to be due to the long-term nature of R&D plans.

If investors in long-term research projects cannot count on the availability of the credit over the lifetime of those investments, they will discount the future benefits that might be realized from the R&E credit and their investment levels will undoubtedly be lower than otherwise. In fact, we have worked with large, research-intensive companies who base their R&E investment decision on enacted law only. That is, they do not take the R&E credit into account in their investment decisions for years after the date at which the credit is scheduled to expire. Since such budgeting decisions are often made one- to two-years in advance, they have already reduced their planned R&E spending for 1995 and 1996 based on the enacted expiration of the credit as of June 30, 1995. They are engaging in less R&E spending than would be the case if future credits were assured. The more uncertain companies are about the long-term future of the credit, the smaller is its potential to stimulate increased research now and in the future. Permanence will remove that uncertainty and make the R&E credit more effective.

Enclosure.

KPMG Peat Marwick LLP

POLICY ECONOMICS GROUP

EXTENDING THE R&E TAX CREDIT: THE IMPORTANCE OF PERMANENCE

PREPARED FOR:

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PREFACE

This report was prepared for the Working-Group on Research and Development ("WORD") by the Policy Economics Group of KPMG Peat Marwick. Its purpose is to review the available evidence regarding the effectiveness of the tax credit for research and experimentation and to determine whether the credit's past performance justifies making it permanent. The report reviews the latest evidence from academic studies, as well as additional survey data from the National Science Foundation and tax return data from the Statistics of Income Division of the Internal Revenue Service

The report consists of an Executive Summary and nine parts. Part I is an introduction; Part II describes the data sources and limitations; Part III discusses the importance of R&D to economic growth; Part IV compares R&D trends in the U.S., Japan and Germany, and describes the R&D incentives provided by these and other large industrialized countries; Part V provides detail on patterns of U.S. R&D activity; Part VI discusses the effectiveness of the R&E tax credit at stimulating additional R&E spending; Part VII explains the importance of permanence to the effectiveness of the tax credit; Part VIII discusses aspects of the credit's structure; and Part IX presents the conclusions of our report.

Two important abbreviations are used throughout this report: (a) R&D refers to research and development, and (b) R&E refers to research and experimentation. R&D is defined as basic and applied research in the sciences and in engineering, and the design and development of prototype products and processes. R&E is a more restrictive term referring to that subset of R&D which consists of investigations aimed at discovering new scientific information that may or may not have specific immediate commercial applications - essentially, basic and applied research, but not development. In general, the tax credit applies only to certain R&E spending. However, exceptions are allowed for certain kinds of development expenses.

The analysis reported in this paper was led by Dr. Rudolph G. Penner, the National Director of Economic Studies, and was advised by Mr. Linden C. Smith, a Principal. The principal analyst for the project was Dr. David M. Skanderson, a Senior Consultant.

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EXECUTIVE SUMMARY

The tax credit for research and experimentation (R&E) has been the subject of frequent policy reviews, impending expiration dates, short-term or retroactive extensions, and occasional structural modifications since its enactment in 1981. Since its original 5-year term, the longest period of stability has been for only 3 years, with the shortest being for just six months. Recent evidence has led analysts to two key conclusions: (a) the R&E tax credit has been a cost-effective means for increasing the nation's research effort, and (b) if the credit were to be made permanent and less subject to occasional structural modification, its cost-effectiveness would be further increased.

Technological change and advances in scientific knowledge are critically important factors contributing to improvements in productivity, real wages and general long-run economic growth. R&D has a strong, positive impact on economic growth and productivity. This is increasingly true in our knowledge- and information-driven world marketplace. Technological innovations, by their very nature, generally yield widespread benefits: innovations in one field may revolutionize production processes in other fields, or lead to improvements in health or environmental quality. This makes it unlikely that businesses will generally be able to capture the full benefits of their costly and risky R&D investments. As a result, from the point of view of the overall economy's best interests, businesses will tend to underinvest in research. For this reason, a tax credit for research and experimentation was enacted with the goal of offsetting the tendency to underinvest in industrial research. The R&E tax credit has been an effective — and cost-effective — tool for stimulating private R&D activity.

Despite the powerful arguments in its favor, the R&E tax credit has had an erratic legislative history. In the 13 years since its enactment in 1981, the R&E credit has been modified four times and extended six times — once for just six months. It was even allowed to expire in 1986 and 1992, only to be renewed retroactively later. It is currently due to expire again in June of 1995.[1] The credit's uncertain future is likely to lessen its ability to continue stimulating increases in R&D. In their 1992 campaign document, Putting People First, Bill Clinton and Al Gore called for the enactment of a permanent extension of the R&E tax credit "to stimulate private investment in civilian R&D." A permanent extension has been included, as well, in several previous budget proposals. The House of Representatives has twice passed a permanent extension — in 1989 and 1993 — but on both occasions the credit was ultimately extended on a temporary basis. The credit's future remains as uncertain as ever.

[1] A brief legislative history of the R&E credit is provided at the end of this report.

According to the Tax Reform Act of 1986, the R&E tax credit was originally limited to a five-year term in order "to enable the Congress to evaluate the operation of the credit." While it is understandable that the Congress would want initially to adopt the credit on a trial basis, such a stance no longer appears to be justified. Evidence from the 13-year history of the credit indicates that it has been an effective tool for stimulating additional R&D activity. The most recent estimates by academic researchers now indicate that the additional research spending stimulated by the credit equals or exceeds its revenue cost. It is recognized that fiscal constraints have been partly responsible for the irregular cycle of short-term renewals. However, continuing to adopt an on-again, off-again short-term approach to stimulating long-term research is a more costly and less efficient policy than permanence. The policy goal of increasing private-sector research spending would be better served by eliminating the uncertainty over the credit's future.

The Working-Group on Research and Development (WORD) asked the Policy Economics Group of KPMG Peat Marwick to examine the most recent economic evidence and official Internal Revenue Service statistical information in order to determine whether a permanent extension of the R&E credit is warranted. Our conclusions are that the credit's effectiveness warrants a permanent extension, and indeed that permanence may well increase its effectiveness. The current short-term approach to subsidizing long-lasting R&D investments imposes unnecessary additional risks on R&D-performing companies, and does not best serve the country's long-term economic interests. To achieve the maximum possible benefits from the credit, it should be made permanent. The key findings of our study are:

- Private industrial R&D spending is highly responsive to the R&E credit. A one-dollar reduction in the after-tax price of R&D stimulates approximately one dollar of additional private R&D spending in the short run, and about two dollars of additional R&D in the long run. That, in turn, implies long-run gains in GDP. The credit has been a public policy success. This success is all the more impressive in light of the credit's erratic legislative history.

- The credit has proven effective, even though the effective marginal credit rate is below the 20 percent statutory rate. Taxpayers claiming the credit must forego the deductibility of part of their R&E expenses. As a result, for corporate taxpayers facing a 35 percent income tax rate, the highest effective marginal rate of credit available is 13 percent, or $13 for each additional $100 of qualified R&E spending. Companies with rapidly increasing R&E may earn a marginal credit of half that rate. Some firms face a marginal rate of *zero*, even though they are increasing their research efforts. These marginal credit rates are further eroded by the limitations imposed under the General Business Credit and the Alternative Minimum Tax.

- Of the $78.2 billion of industry-funded R&D performed in 1991, $39.7 billion — about 50 percent — was reported to the IRS as qualifying for the R&E credit. A portion of the non-qualifying R&D spending is accounted for by depreciation on special-purpose capital and equipment, certain overhead costs, and 35 percent of

contract research expenses, which are all necessary to carrying out research and experimentation. From the $39.7 billion in qualified spending, $1.5 billion in tentative credits were actually earned. This implies an average tentative credit equal to 3.8 percent of qualified R&E ($3.80 per dollar of qualified R&E spending), or 1.9 percent of total R&D, before recognizing the additional reductions due to foregone deductions, the General Business Credit and the Alternative Minimum Tax.

- At the macroeconomic level, the growth rates of U.S. total and non-defense R&D spending increased after 1981; but the growth has slowed since 1986. This slowdown may be attributable to a number of factors, including the slowdown in GDP growth and shrinking of the manufacturing sector in the late-1980's; the 1986 reduction in the credit rate, tightening of the definition of qualified R&E expenses, and inclusion of the credit in the General Business Credit; the 1988 partial disallowance of deductions for qualified R&E; and the post-1986 increase in uncertainty over the future of the credit. The slowdown occurred both in real dollar terms and as a percentage of GDP ('R&D intensity'). In terms of non-defense R&D intensity, Japan and Germany have increased their lead over the U.S.

- The R&E credit benefits highly research-intensive start-up companies, even when they have little or no current tax liability. Capital investment in these companies is based on the after-tax earnings expected in the future, once products in development become commercialized. The availability of the credits to offset current and future tax expense increases a company's valuation by increasing projected after-tax earnings, making it easier to attract risk capital.

- The R&E credit is generally effective in stimulating increased research spending; however, there are certain circumstances where the structure of the credit limits its incentive effect. Specifically, for some research-intensive companies the fixed-base percentage assigned under current law is too high to provide a realistic spending target, given their current business conditions. Therefore, they receive no incentive for additional increases in R&E. Policymakers may wish to consider ways in which to enhance the credit's incentive effect and increase its utilization, but such a review should not delay a permanent extension of the R&E credit given its June 30, 1995 expiration date.

These points are discussed in greater depth in the pages that follow.

EXTENDING THE R&E TAX CREDIT: THE IMPORTANCE OF PERMANENCE

I. INTRODUCTION

The Working-Group on Research and Development ("WORD") asked the Policy Economics Group of KPMG Peat Marwick to examine the available economic evidence on the effectiveness of the tax credit for research and experimentation (R&E) and to determine whether the credit's past performance justifies making it a permanent feature of the Internal Revenue Code.[2] This report reviews the most recent academic studies on the credit's effectiveness. The academic evidence is supplemented by the most recent survey data available from the National Science Foundation and by tax return data from the Statistics of Income Division of the Internal Revenue Service.

The tax credit for research and experimentation was originally enacted as part of the Economic Recovery and Tax Act of 1981. It has never been a permanent part of the tax code. In the 13 years since its enactment, the R&E credit has been modified four times and extended six times — once for just six months. It was even allowed to expire in 1986 and 1992, only to be renewed retroactively later. It is currently due to expire again in June of 1995.

The arguments in favor of a government stimulus to scientific research are widely accepted by economists. Technological change and advances in scientific knowledge are known to be important factors contributing to long-run improvements in productivity and economic growth. In addition, technological innovations generally yield widespread benefits to society. Individual inventors and innovators are generally unable to capture all of the benefits of their successful innovations. While these 'spill-over' effects are beneficial to society, they provide no incentive to perform R&D. This is why a government tax credit is necessary: Businesses left to themselves will have inadequate incentives to invest in R&D to the extent that would be most desirable to society at large. By reducing the cost of R&D, the tax credit helps to overcome the tendency of businesses to underinvest in scientific research.

The R&E tax credit's effectiveness is supported by substantial economic evidence. In addition, considerable political support appears to exist for making the credit permanent. In Putting People First, their 1992 campaign document, then-candidates Bill Clinton and Al Gore, called for permanent enactment of the R&E credit as part of their technology policy. A permanent extension was included, as well, in several past budget proposals. And, in both 1989

[2] While the tax credit of interest applies to research and *experimentation*, the credit is often referred to as the 'R&D credit' in common parlance. The terminology is further blurred by the fact that certain development cost can qualify as experimentation under the tax credit (for example, in software and pharmaceuticals). In addition, the economic literature almost universally addresses research and *development* — in part due to an inability to distinguish between experimentation and development in the available data. We will use the technically most appropriate terminology for each instance throughout this report.

and 1993, the House of Representatives passed a permanent extension. On both occasions, however, the credit was ultimately extended on a temporary basis. Budgetary constraints appear to have been partly, if not entirely, responsible for the failure to make the credit permanent.

This report begins by discussing the importance of R&D activity to economic growth. We discuss the wealth of evidence linking technological innovation to improvements in productivity and living standards. We discuss, as well, the evidence of a tendency to underinvest in R&D. Next, we show how U.S. R&D performance compares to that of Japan and Germany, and summarize the different incentives for R&D provided by these countries. This is followed by a description of the distribution of U.S. R&D activity across geographic regions, across major industries, and across companies of different sizes. Next, the economic evidence regarding the tax credit's effectiveness in stimulating research is reviewed. We then discuss how uncertainty over the credit's future (due to its temporary status and erratic legislative history) erodes its effectiveness, and how permanence could make it even more effective than it has been. Finally, we describe how the current structure of the R&E tax credit limits or eliminates its incentive effects for some research-intensive companies.

II. DATA SOURCES AND LIMITATIONS

The data used in this study are the most recent data available from the National Science Foundation (NSF) and from the Statistics of Income Division of the Internal Revenue Service (SOI). The NSF data are based on the "Survey of Research and Development in Industry," which is administered by the U.S. Bureau of the Census. [3] They represent national estimates of the total expenditures on R&D performed in the U.S. by industrial firms — whether U.S.- or foreign-owned. The sampling unit is the enterprise, or company, defined as a business organization consisting of one or more establishments under common ownership or control. It is a sample survey in which it is intended that all R&D-performing companies, both privately and publicly held, are included or represented. All manufacturing industries are included, as are certain non-manufacturing firms known (based on earlier samples) to conduct R&D. Information from individual companies in the sample is used to develop national estimates on an industry-by-industry basis.

The NSF data provide: (1) national estimates of total R&D performed by industry in the U.S.; (2) the portion of the effort that is financed by U.S. government funds; (3) the amount financed by the companies themselves or by other non-Federal sources, such as state and local governments or other industrial firms; and (4) industry and geographic breakdowns of the data. Companies with multiple establishments are assigned to an industry class based on the establishment with the highest value of payroll. While survey respondents are provided with detailed definitions to help them determine which expenses to include or exclude from the R&D data they provide, the statistics reported by the NSF are still subject to response and conceptual errors caused by differing interpretations of the definitions and by variations in company accounting procedures. Therefore, the data are better indicators of changes in, rather than absolute levels of, R&D spending.

Corporation tax return data are based on unpublished tabulations prepared by the Statistics of Income Division from its 1991 Corporation Returns data file (the most recent year for which data are available). The SOI data represent estimates based on a stratified statistical sampling from the set of all tax returns filed by for-profit corporations. The sampling procedure is designed to collect information from tax returns of all the largest corporations and from a sample of smaller corporations.[4] The tabulations requested were restricted to the set of corporations that filed Form 6765, "Credit for Increasing Research Activities," excluding S corporations, RIC's, REIT's, FSC's and DISC's.[5] This resulted in a sample of 9,299 returns, from which specific return line items were obtained, aggregated by SOI into broad industry and

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[3] Reported in *Science & Engineering Indicators—1993*, National Science Board, Washington, DC: U.S. Government Printing Office, 1993.

[4] Details of the SOI sampling methodology are contained in Internal Revenue Service, Statistics of Income, *Corporation Income Tax Returns*, Washington, DC: U.S. Government Printing Office.

[5] Regulated Investment Companies (RIC's), Real Estate Investment Trusts (REIT's), Foreign Sales Corporations (FSC's), and Domestic International Sales Corporations (DISC's) are either not subject to corporation income taxes or are only subject to tax on a share of their income.

asset- size classifications to avoid disclosure of individual taxpayer information. These returns represent about one-quarter of one percent of all 1991 corporate return filers, but 21 percent of the book asset value of all corporate filers. Industry coding used in SOI data is determined by the predominant source of corporate receipts. For consolidated groups with numerous activities and lines of business, these data should be interpreted with caution. For example, a manufacturing business may well have substantial revenues from servicing products or from a financial subsidiary. In addition, these tax return data are collected from returns as originally filed. They do not include audit adjustments, or carrybacks of losses or credits.

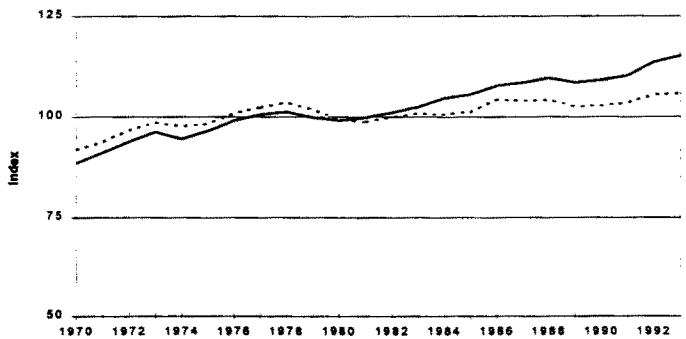
The SOI data may understate the amount of qualified R&E actually performed in the U.S. in 1991, since it may be the case that not all R&D performers filed for the tax credit. Some performers of qualified R&E might not have filed due to ignorance of the credit or due to being unaware that they qualified for the credit. Others — namely those who only perform a small amount of R&E — may have concluded that the extra paperwork, record-keeping and other effort involved in the credit were not justified by the expected benefits of the credit. Some companies that qualified for the credit, but had no tax liability against which to claim the credit may also not have filed the form. Data are not available for estimating how large or small this measurement error may be.

Data on productivity and compensation come from the U.S. Department of Commerce, as reported in the Economic Report of the President, 1994.

III. R&D AND ECONOMIC GROWTH

R&D activity produces ideas and information about new materials and compounds, about new ways of combining and using them, about new production processes, and about new ways of designing new or existing products for the satisfaction of the wants of consumers and producers. Such advances in scientific and technical knowledge are important factors explaining improvements in productivity and long-run economic growth. Innovations resulting from successful research and development (R&D) increase productivity, which contributes to increasing wages and standards of living. As illustrated in Figure 1, movements over time in real total compensation per hour are strongly correlated with movements in productivity (as measured by output per hour). Numerous economic studies of the R&D-productivity link conducted over the past 20 years indicate that: (a) company-funded industrial R&D investments yield a rate of return of about 35 percent, on average, in terms of increased productivity; (b) by contrast, direct government spending on R&D yields less than 5 percent, on average; and (c) basic research yields the greatest productivity increases.[6] This evidence indicates that it is more cost effective

Figure 1: Productivity & Total Compensation



Source: U.S. Department of Commerce

[6] Zvi Griliches, "The Search for R&D Spillovers," *Scandinavian Journal of Economics* Vol. 94 (Supplement), 1992, S29-S47. Zvi Griliches and Frank R. Lichtenberg, "R&D and Productivity Growth at the Industry Level: Is there Still a Relationship?" in *R&D, Patents, and Productivity*, edited by Z. Griliches, Chicago: University of Chicago Press, 1984, 465-96. Zvi Griliches and Frank R. Lichtenberg, " Interindustry Technology Flows and Productivity Growth," *Review of Economics and Statistics*, May 1984, 324-29. Frank R. Lichtenberg and Donald Siegel, "The Impact of R&D Investment on Productivity — New Evidence Using Linked R&D-LRD Data, *Economic Inquiry* Vol. 29, April 1991, 203-228. Edwin Mansfield, "Basic Research and Productivity Increase in American Manufacturing," *American Economic Review* Vol. 70, December 1980, 863-73.

for government to subsidize private-sector research by generally reducing its cost with a tax credit than it is for the government to spend directly on R&D. In this way, critical decisions about what kinds of research may most profitably be undertaken are left to the private sector.

In designing an appropriate public policy approach to R&D activity, it is important to understand that R&D is a 'public good': innovations in one field may yield widespread benefits beyond the private benefits to the innovator. Developments in one sector often have 'spillover' effects which may revolutionize production processes in other sectors. Once an innovation is achieved, it can often be copied by competitors, who drive down prices. A cost-reducing innovation in one company, or one industry, leads to cost reductions in other companies and industries. As well, new technologies can play an important role in suggesting and prompting further innovations. This, in turn, generates an even greater social return. For example, computer and semiconductor innovations have transformed most sectors of the economy — both high-tech and low-tech. Just-in-time inventory management — made possible by computer technology — makes both high-tech manufacturers and low-tech discount retailers more productive and more competitive. Developments in pharmaceuticals and biotechnology — such as treatments for breast cancer, cystic fibrosis and AIDS — translate directly into increases in the quality of life. There is considerable economic evidence indicating that R&D — especially when privately funded — has a strong, positive impact on productivity and economic growth. Therefore, taxpayers — as consumers and as workers — will benefit if more R&D is encouraged.

Despite the evident widespread benefits to society of scientific research, businesses left to themselves will not necessarily have the incentive to invest in research to the extent that would be consistent with the best interests of the overall economy. This is because businesses are not generally able to capture the full benefits of their costly and risky R&D investments *precisely because of* the spillover effects of technological innovations. The private and social returns to R&D have been extensively studied.[7] The evidence accumulated over the past 20 years overwhelmingly supports the notions both that the rate of return to R&D expenditures is quite high, and that the benefits to society from R&D exceed (often by a large amount) the return to private innovators. The 'social' returns to R&D investments are on average twice as high as the private returns. The social returns can be many times higher for certain kinds of successful innovations, as shown in Table 1. Edwin Mansfield, et al., found that the median social rate of return to R&D was 56 percent, while the median private rate of return was only 25 percent. He also found that in 30 percent of his sample cases the private rates of return were so low that no company with the advantage of hindsight would have invested in the innovation; but the social

[7] For example, see Edwin Mansfield, John Raporport, Anthony Romeo, Samuel Wagner, and George Beardsley, "Social and Private Rates of Return from Industrial Innovations," *Quarterly Journal of Economics* Vol. 41, May 1977, 221-40. Zvi Griliches, "Returns to Research and Development Expenditures in the Private Sector," in *New Developments in Productivity Measurement*, edited by J.W. Kendrick and B. Vaccara. National Bureau of Economic Research Studies in Income and Wealth No. 44, Chicago: University of Chicago Press, 1980, 419-54. Jeffrey I. Bernstein and M. Ishaq Nadiri, "Interindustry R&D Spillovers, Rates of Return, and Production in High-Tech Industries," *American Economic Review Papers and Proceedings* Vol. 78 No. 2, May 1988, 429-434. The work in this area is also surveyed in Zvi Griliches, "The Search for R&D Spillovers," National Bureau of Economic Research Working Paper No. 3768, 1991.

rates of return were so high that, from society's point of view, the investments were well worthwhile. From this evidence, one can well imagine that there are likely to be many socially beneficial investments which are never undertaken because their private returns are expected to be too low. In addition, the evidence indicates that the rate of return to R&D investments is, on average, 1.5 to 2 times greater than the return on physical capital.

Table 1: Estimated Rates of Return to R&D Investments, 1981[8]

Industry	Private Rate of Return	Social Rate of Return
Chemicals	13.3%	29.1%
Non-electrical machinery	24.0%	45.0%
Electrical products	22.4%	30.2%
Transportation equipment	11.9%	16.3%
Scientific instruments	16.1%	128.9%

Source: Bernstein and Nadiri, 1988, *op. Cit.*

One could argue that, in theory, R&D incentives (including tax credits, grants and patent systems) could lead to an overinvestment in R&D in some cases.[9] But the empirical evidence cited and summarized above strongly favors the underinvestment hypothesis — social rates of return to R&D in both industry and agriculture are generally well in excess on private rates of return.

Because of this underinvestment in R&D the U.S. government, and governments in many other industrialized countries, have long provided favorable tax treatment for investments in research. The U.S. government allows current deductibility of non-capital scientific research and experimentation (R&E) expenses. And, in 1981 the Congress enacted a special tax credit for scientific R&E with the goal of offsetting the tendency to underinvest in industrial research.

[8] Bernstein and Nadiri estimate total rates of return to R&D investments based on variable cost reductions and inter-industry spillovers of R&D. Private rates of return represent the real value of an industry's reduction in its own variable cost due to an increase in its own R&D. The social rate of return to an industry's R&D equals its private rate of return plus the sum of reductions in other industries' variable costs due to spillovers of the first industry's R&D.

[9] For example, see the arguments in Partha Dasgupta and Joseph Stiglitz, "Uncertainty, Industrial Structure, and the Speed of R&D," *Bell Journal of Economics* Vol. 11, 1980, 1-28.

IV. INTERNATIONAL R&D TRENDS AND INCENTIVES

The growth rates of both total and non-defense U.S. R&D spending increased after 1981, but declined noticeably after 1985, as shown in Table 2. This is the case in terms of both constant-dollar amounts *and* 'R&D intensity' (R&D as a percentage of GDP).[10] Non-defense R&D spending grew at an average rate of 4.9 percent from 1981 to 1985, but at an average rate of just 2.1 percent from 1986 to 1990 (which does not include the fall of 4.5 percent in the recession year 1991). The slowdown may be due to a number of factors. These include , the slowed pace of GDP growth and the shrinking of the U.S. manufacturing sector (in terms of both the number of firms and output) in the late 1980's, the 1986 tightening of the definition of qualified R&E expenditures, the 1986 reduction in the statutory rate of credit (from 25 percent to 20 percent), the 1986 inclusion of the credit in the General Business Credit, the increase in uncertainty surrounding the credit, and the 1988 partial disallowance of deductions for R&E expenses.

Table 2: Growth Rates of U.S. R&D and GDP, 1970-1991

	1970-1980	1981-1990	1981-1985	1986-1990
Total R&D Growth Rate	1.63%	3.94%	6.46%	1.41%
Non-Defense R&D Growth Rate	2.54%	3.47%	4.89%	2.06%
GDP Growth Rate	2.49%	2.56%	2.49%	2.62%

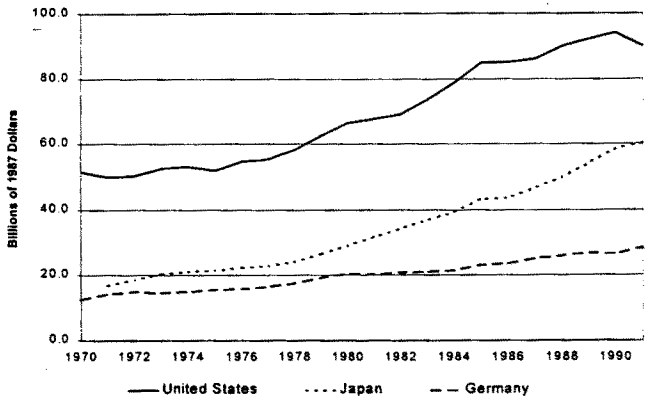
Source: National Science Foundation

The trends in non-defense R&D and R&D intensity are illustrated in Figure 3.[11] While the U.S. leads in total dollars spent, it lags behind both Japan and Germany in terms of non-defense R&D intensity. In fact, U.S. non-defense R&D intensity has been flat at 1.9 percent after peaking at 2.0 percent in 1985, while Japan's continued to grow to 3.0 percent. While Germany's R&D intensity has been fairly stable at 2.7 percent since 1987, it is at a significantly higher level than in the U.S.

[10] R&D intensity is a measure of the fraction of a country's annual product that it devotes to R&D activity.

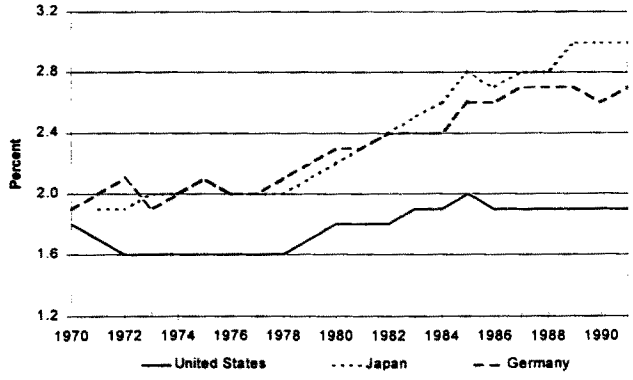
[11] German data are for the former West Germany only. R&D spending for Japan and Germany were converted into U.S. dollars using purchasing power parity exchange rates computed by the O.E.C.D.

Figure 2: Non-Defense R&D Spending in U.S., Japan & Germany, 1970-1991



Source: National Science Foundation

Figure 3: Non-Defense R&D as a Percentage of GDP in U.S., Japan & Germany, 1970-1991

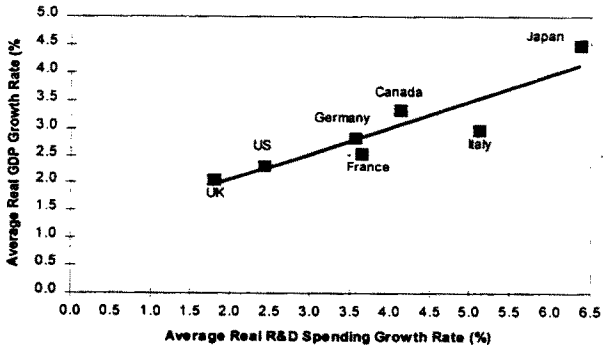


Source: National Science Foundation

The importance of R&D in economic growth is illustrated in Figure 4: Across countries, faster growth in national R&D spending is associated with faster growth in GDP. While this diagram by itself does not demonstrate causation, numerous economic studies have concluded that measures of innovation are important factors explaining the differences in economic growth among countries.[12]

Some of our major trading partners and competitors provide generous tax incentives for R&E, including both deductibility of current research expenses (and, in some cases, capital expenses) and special tax credits. The definition of qualified expenses is similar across countries, focusing on scientific research and experimentation. Japan provides a 20 percent tax credit for qualified expenditures in excess of a base amount, up to 10 percent of current tax liability. In addition, there is a 7 percent flat credit for qualifying depreciable property used in the research and development of basic technology (including new materials, biotechnology, advanced electronics, and robotics). Canada has experimented with various forms of tax incentives since 1962. The law in effect since 1984 provides a flat-rate credit equal to 20 percent of qualified expenditures, with higher rates for small companies and for research in certain disadvantaged geographic areas. Credits may offset up to 75 percent of tax liability. Canada also allows deductibility of capital expenses attached to scientific research. Germany provides tax incentives to R&D through investment grants and special depreciation allowances for equipment acquired for R&D purposes, in addition to current deductibility of R&D expenses. The UK has special allowances and favorable depreciation schedules for capital expenditures related to scientific research.

Figure 4: Total R&D Spending Growth versus GDP Growth in Major Industrialized Countries, 1970-1991



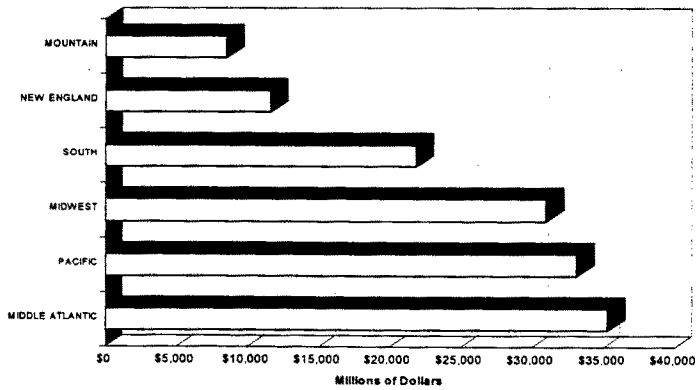
Source: National Science Foundation

[12] See the recent survey by Jan Fagerberg, "Technology and International Differences in Growth Rates," Journal of Economic Literature Vol. 32, No. 3, 1994, 1147-1175.

V. PATTERNS OF U.S. R&D ACTIVITY

Figures 5 through 9 present a snapshot of R&D activity in the U.S. in 1991 (the most recent data available).[13] Total U.S. R&D spending amounted to $102.3 billion, $78.2 billion of which was private R&D spending. On a regional basis, the Middle Atlantic states lead the country with $35.3 billion total R&D spending, followed closely by the Pacific Region with $33.1 billion.[14] On a state basis, California leads the country with $28.3 billion in total spending, followed by New York, Michigan, New Jersey and Massachusetts.

Figure 5: Total R&D Spending, by Region, 1991

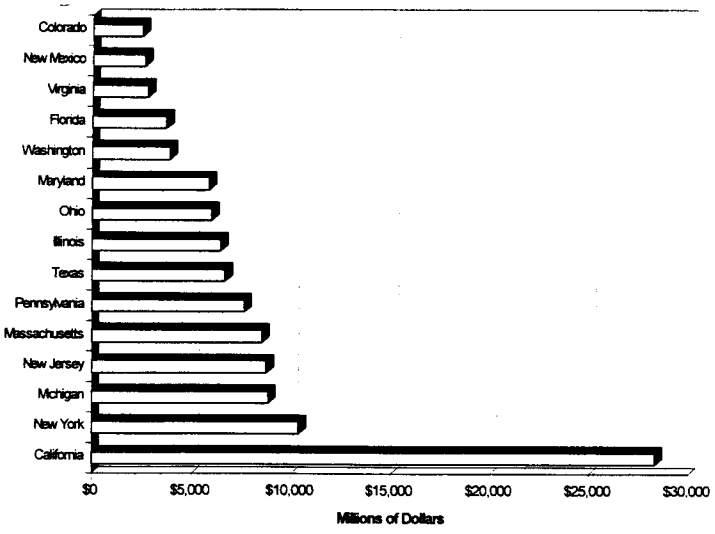


Source: National Science Foundation

[13] Figures 5, 6 and 9 show *total* R&D spending, which includes both private and federal sources. For many states, including Texas and Washington in the top 15, the NSF does not separately report private spending due to disclosure concerns. While private and federal spending are positively correlated across states, the ranking in Figure 6 is not preserved exactly when stated in terms of private spending. For the top five states, private industry spending was as follows: California, $12.5 billion; Michigan, $8.1 billion; New Jersey, $7.0 billion; New York, $6.8 billion; Massachusetts, $5.0 billion.

[14] MIDDLE ATLANTIC: Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania. PACIFIC: Alaska, California, Hawaii, Oregon, Washington. MIDWEST: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin. SOUTH: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia. NEW ENGLAND: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont. MOUNTAIN: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming.

Figure 6: Total R&D Spending, Top 15 States, 1991



Source: National Science Foundation

At the industry level, Figures 7 and 8 show qualified R&E spending and average R&E intensities (total qualified company R&E spending as a percentage of gross receipts) based on IRS data on corporations filing for the R&E credit in 1991. Among the most research-intensive are high-tech industries such as Instruments & Related, Electrical and Electronic Equipment (which includes computers and semiconductors), Chemicals & Allied (which includes pharmaceuticals and biotechnology), and Services (which includes computer software, systems design and computer programming).[15] Of course, the industry averages tend to mask the fact that certain high-tech companies (especially start-ups) have far higher R&E intensities.

Table 3 displays the top ten industry earners of tentative R&E credits in 1991. The first column of numbers indicates the proportion of taxpayers filing for the R&E credit that was

[15] The idustry classifications are the two-digit Standard Industry Classifications (SIC) for the manufacturing sector, and one-digit SIC's for the non-manufacturing sectors. These classifications can be misleading. For example, computer software is not commonly thought of as a 'service' industry.

accounted for by each industry. The next column gives the proportion of the total reported qualified R&E spending accounted for by each industry. The third column tells what fraction of the reported tentative credits was earned by each of the industries. The final column is a running summation of the numbers in the third column. Manufacturing as a whole accounted for 81 percent of the total tentative credits generated.[16] The Chemicals industry was the top earner of tentative credits, followed by Machinery and by Electrical and Electronic Equipment. The Services industry, which includes many high-tech industries such as pre-packaged software, ranked fourth.

Table 3: Top 10 Tentative R&E Credit Earners, 1991

Industry	Fraction of Credit Filers	Fraction of Total Qualified R&E	Fraction of Total Tentative Credits	Cumulative Fraction of Tentative Credits
Chemicals & allied products	7.3%	20.3%	21.2%	21.2%
Machinery, except electrical	8.2%	16.0%	17.6%	38.8%
Electrical & electronic equip.	17.0%	13.5%	13.4%	52.2%
Services	23.2%	5.8%	10.4%	62.6%
Motor vehicles & equipment	0.5%	12.8%	10.0%	72.6%
Instruments & related	9.7%	8.5%	7.2%	79.8%
Transport. & public utilities	1.9%	7.1%	4.3%	84.1%
Petroleum & coal products	0.4%	2.3%	2.7%	86.8%
Wholesale & retail trade	11.3%	1.8%	2.6%	89.4%
Trans. equip., ex. motor veh.	0.7%	3.1%	1.7%	91.1%

Source: Statistics of Income Division, Internal Revenue Service

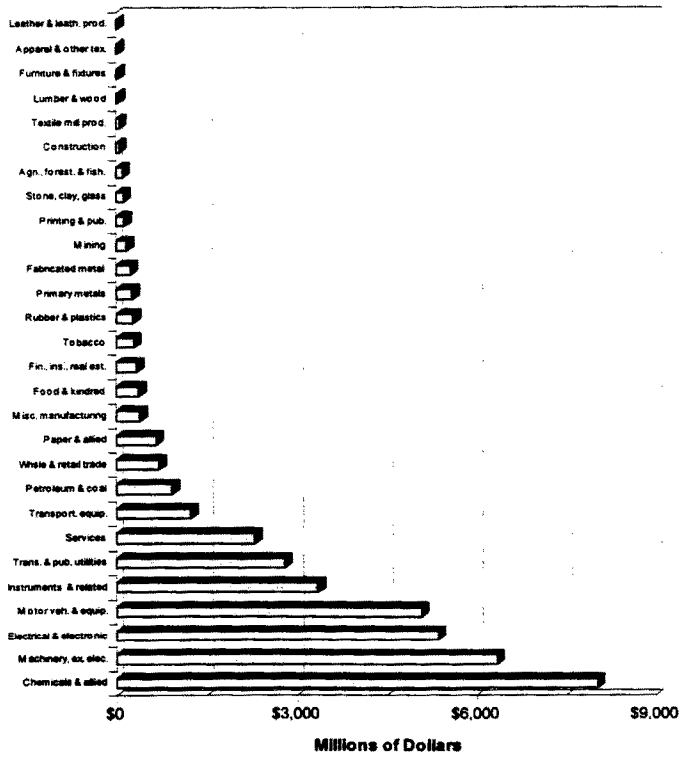
The statistics for tentative credits should be interpreted with caution, however, as they do not correspond precisely to the actual credits that were claimed by taxpayers. The amount of tentative credits actually claimed depends importantly on factors such as limitations imposed by the General Business Credit (GBC) and Alternative Minimum Tax (AMT), as well as on whether the company has a current federal tax liability to offset. Since firm-level tax return data cannot be obtained, it is not possible to know how much of the tentative credits generated by taxpayers could actually be claimed in 1991, how much could be carried forward or carried back, or how the effects of the GBC and AMT may impact the distribution of credits across industries. It should be noted, however, that the proportion of filers affected by the AMT is generally higher in recession years, such as 1991, than in expansion years.

[16] Manufacturing does not include Services; Transportation and Public Utilities; Agriculture, Forestry and Fishing; Mining; Construction; Wholesale and Retail Trade; and Finance, Insurance and Real Estate.

It is worth noting that R&E credits represented the overwhelming majority of all new GBC's generated by corporations filing for the R&E credit in 1991.[17] A total of $5.86 billion of tentative GBC's were available in 1991, of which $3.98 billion consisted of carryforwards of GBC's from previous years, leaving $1.88 billion of new tentative credits. Of these new tentative credits, $1.54 billion — or 82 percent — consisted of tentative R&E credits. Only $1.15 billion of tentative GBC's (20 percent of the total available) were actually claimed in 1991.

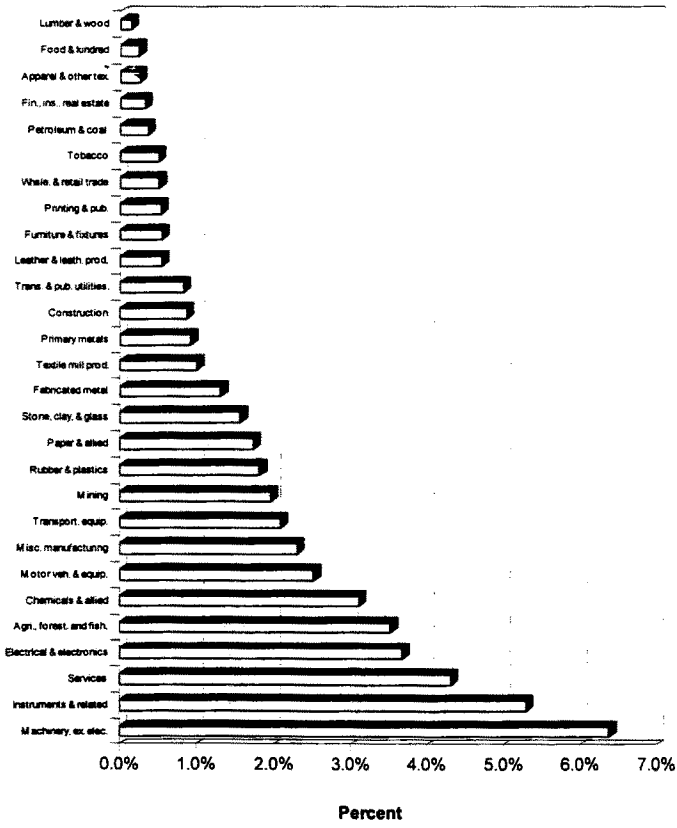
[17] In addition to the R&E credit, the GBC includes the investment tax credit, the jobs credit, the alcohol fuels credit, the low-income housing credit, the enhanced oil recovery credit, the disabled access credit, and the renewable electricity production credit. The key limitation attached to claiming tentative GBC's is that credits may not exceed 25 percent of net regular tax (if regular tax exceeds $25,000).

Figure 7: Qualified R&E Spending by Industry, 1991



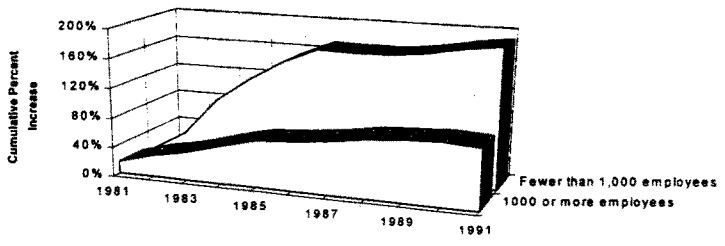
Source: Statistics of Income Division, Internal Revenue Service
(Industry classifications are clarified on Page 16)

Figure 8: Average R&E Intensity, by Industry, 1991



Source: Statistics of Income Division, Internal Revenue Service
(Industry classifications are clarified on Page 16)

Figure 9: Cumulative Percentage Increase in Total R&D Spending, by Firm Size



Source: National Science Foundation

As shown in Figure 9, small companies are an increasingly important source of R&D spending. The cumulative percentage increase in total R&D spending from 1980 to 1991 by firms with fewer than 1000 employees was 189 percent, compared to 81 percent for larger firms. The fraction of total U.S. R&D performed by companies with less than 1000 employees more than doubled from 4.6 percent in 1980, to 10.5 percent in 1991. The fraction of non-federally funded R&D performed by these companies also more than doubled from 5.6 percent in 1980 to 12.4 percent in 1991.

However, the bulk of R&D is still performed by large companies: Companies with 10,000 or more employees performed 75 percent of total U.S. R&D (70 percent of non-federally funded R&D) in 1991. Table 4 presents SOI data on qualified R&E and tentative credits classified by asset size. Corporations with a book asset value of $250 million or more performed 83 percent of the qualified R&E in 1991, and earned 74 percent of the tentative credits. Those with book values of under $10 million performed 5.4 percent of the qualified R&E and generated 9.6 percent of the tentative credits.

Table 4: Qualified R&E and Tentative Credits, by Asset Size, 1991[18]

Book Value of Assets	Fraction of Credit Filers	Fraction of Total Qualified R&E	Fraction of Total Tentative Credits
$1 under $250,000	17.8%	0.4%	0.9%
$250,000 under $1,000,000	18.2%	0.7%	1.4%
$1,000,000 under $10,000,000	36.4%	4.3%	7.3%
$10,000,000 under $50,000,000	13.3%	4.6%	6.6%
$50,000,000 under $250,000,000	6.9%	7.0%	9.5%
$250,000,000 or more	6.6%	82.9%	74.1%

Source: Statistics of Income Division, Internal Revenue Service

[18] Excludes taxpayers reported in the 'Zero Assets' category; therefore, the columns may not sum to 100 percent. This category includes final returns of liquidating and dissolving corporations and of merging corporations whose assets and liabilities were reported in the returns of the acquiring corporations, as well as part-year returns of corporations.

VI. EFFECTIVENESS OF THE R&E TAX CREDIT

Has the R&E tax credit had the effect of increasing socially desirable research spending? Are the increases worth the lost tax revenue? Since the credit's enactment in 1981, numerous economists have sought to answer these questions. The exact magnitude of the incentive effect of the credit has been the subject of some disagreement. The evidence that was available when the credit was last considered for renewal indicated a relatively small, but positive effect of the credit on R&D expenditure. However, more recent and more sophisticated studies indicate a much more sizable effect than was found previously.

Early studies from the years immediately following the enactment of the credit tended to show a small positive effect on R&D. For example, surveys by Mansfield and by the National Science Foundation indicated only a modest increase in companies' R&D spending as a result of the credit.[19] Eisner, et al. could find no difference in the growth in R&D spending between firms that were eligible for the credit in 1981 and those that were not.[20]

Since the R&E tax credit's last major review and overhaul in 1989, considerable new evidence has accumulated on its effectiveness. Recent studies have been conducted by Bronwyn Hall of the National Bureau of Economic Research and the Hoover Institution; by Martin Baily and Robert Lawrence of the the University of Maryland and Harvard University, respectively; and by numerous others.[21] These recent studies have benefited from longer data series, which allow measurement of the longer-term effects of the credit. They have also corrected methodological deficiencies in earlier studies; for example, controlling for the influence of certain non-tax-related factors on companies' R&D spending. The studies indicate that at the margin one dollar of R&E credit stimulates approximately one dollar of additional private R&D spending over the short run, and as much as two dollars of extra R&D over the longer-run.[22] In other words, companies' R&D spending is quite sensitive to the price of R&D, especially over

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[19] Edwin Mansfield, "Public Policy toward Industrial Innovation: An International Study of Direct Tax Incentives for Research and Development," in The Uneasy Alliance: Managing the Productivity-Technology Dilemma, edited by Kim B. Clarck, Robert H. Hayes and Christopher Lorenz, Boston: Harvard Business School Press, 1985. NSF, Science Research Studies Highlights, 1982, 1984, 1985.

[20] Robert Eisner, Steven H. Albert and Martin A. Sullivan, "The New Incremental Tax Credit For R&D: Incentive or Disincehtive?" *National Tax Journal* Vol.37 No.2, 171-183.

[21] Bronwyn H. Hall, "R&D Tax Policy During the 1980's: Success or Failure? in Tax Policy and the Economy Vol. 7, edited by James Poterba, National Bureau of Economic Research, 1993. Martin Neil Baily and Robert Z. Lawrence, "Tax Incentives for R&D: What Do the Data Tell Us?" study commissioned by the Council on Research and Technology. Martin Neil Baily and Alok K. Chakrabarti, Innovation and the Productivity Crisis, Brookings Institution, Washington, DC, 1988. Philip G. Berger, "Explicit and Implicit Tax Effects of the R&D Tax Credit," Journal of Accounting Research, Vol. 32n No. 2, 1993. James R. Hines, Jr., "On the Sensitivity of R&D to Delicate Tax Changes: The Behavior of U.S. Multinationals in the 1980's," in Studies in International Taxation, edited by Alberto Giovannini, R. Glenn Hubbard, and Joel Slemrod, National Bureau of Economic Research, 1993. C.W. Swensen, "Some Tests of the Incentive Effects of the Research and Experimentation Tax Credit," Journal of Public Economics, Vol. 49, 1992.

[22] The 'short-run' in this case means within two years.

the longer run. The recent, more thorough studies contradict the evidence presented by the GAO in their 1989 report to the Congress.[23] At that time, the available evidence indicated that no more than one-half dollar of additional research was stimulated by each Treasury dollar spent. By contrast, Bronwyn Hall has estimated that the additional spending stimulated by the tax credit was about $2.4 billion per year on average (in 1987 dollars).[24] This compares favorably with the U.S. Treasury's estimates of revenue losses due to the credit ranging from $0.5 billion (1987 dollars) in 1982 to $1.9 billion (1987 dollars) in 1987. The estimates of Baily and Lawrence, and the other studies cited, support this conclusion.

In summary, the best available evidence now indicates that the increases in R&D due to the tax credit equal or exceed the credit's revenue cost. The differences in results between recent and previous studies are due mainly to two factors: (1) earlier studies failed to account for important interactions of the credit with the Internal Revenue Code, and (2) the slow adjustment of long-term R&D plans means that the full effect of the credit was not detectable in early studies. The direct increase in R&D spending understates the full economic impact of the credit, since the resulting long-run increases in productivity, GDP and standards of living are not taken into account.

The credit has proven effective, even though the effective marginal credit rate is below the 20 percent statutory rate. Taxpayers claiming the credit must forego the deductibility of part of their R&E expenses. Taxpayers must elect to either reduce their ordinary deductions of R&E expenses by the amount of credit claimed, or to receive credits at a marginal rate of 13 percent of qualified R&E spending rather than 20 percent. In fact, the highest effective marginal rate a corporation can receive is 13 percent ($13 dollars for each additional $100 of qualified R&E spending above the base amount), assuming it faces a corporate income tax rate of 35 percent.[25] Companies with rapidly increasing R&E are likely to earn a marginal credit of at most 6.5 percent, assuming a 35 percent corporate tax rate. Due to the operation of the fixed base period, some firms face a marginal rate of zero, even though they are increasing their research efforts. These marginal credit rates are further eroded by the limitations imposed under the General Business Credit and the Alternative Minimum Tax.

We can illustrate what these estimates of responsiveness imply for actual R&D spending: Let us assume a permanent R&E tax credit average effective marginal rate of 8 percent.[26] Then, the estimated one-dollar increase in R&D spending over the short run (within two years) arising

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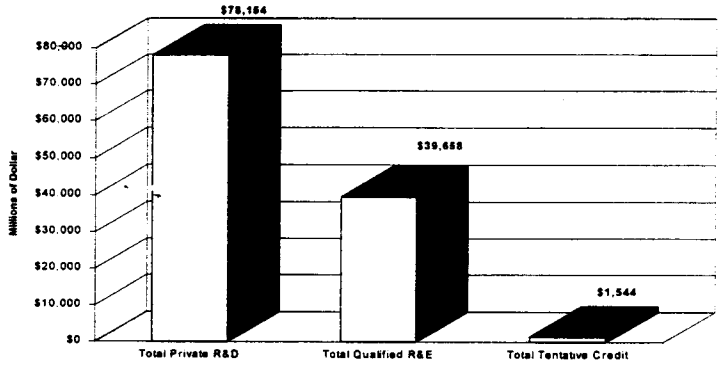
[23] Tax Policy and Administration: The Research Tax Credit Has Stimulated Some Additional Research Spending, Report to Congressional Requesters (GAO/GGD-89-114), September 1989.

[24] Hall reports an estimate of $2 billion in 1982 dollars, which we convert to 1987 dollars using the implicit GDP price deflator.

[25] In general, the effective marginal credit rate is 20 percent times one minus the effective corporate income tax rate. The 20 percent marginal credit rate is applied either to the amount of a company's qualified research and experimentation expenses in excess of a calculated base amount, or to one half of their qualified expenses, whichever is smaller. Larger corporate taxpayers generally experience a 35 percent marginal income tax rate. This rate applies to corporate taxable income in excess of $10 million.

[26] Hall estimated the average effective marginal rate of credit for a sample of about 800 publicly traded firms to be 7.7 percent in 1990. The average rate is 10.5 percent when weighted by R&D spending in each firm.

Figure 10: Private R&D, Qualified R&E and Tentative Credits, 1991



Source: National Science Foundation and Statistics of Income Division, Internal Revenue Service

from one extra dollar of tax credits implies a short-run increase in aggregate R&D spending of about 8 percent. Given a *long-run* response of about two dollars of extra R&D spending for each additional dollar of credits, a permanent R&E tax credit with an average effective marginal rate of 8 percent would lead to a permanent, long-run increase in aggregate R&D spending of about 16 percent.

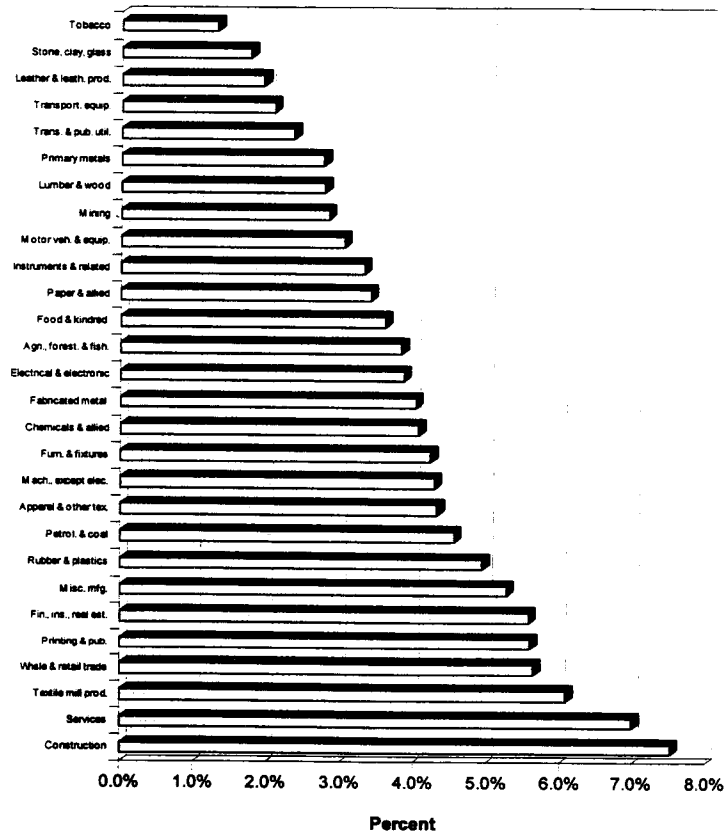
Of the $78.2 billion of industry-funded R&D performed in 1991, $39.7 billion — about 50 percent — was reported to the IRS as qualifying for the R&E credit. A portion of the non-qualifying R&D spending is accounted for by depreciation on special-purpose equipment, certain overhead costs, and 35 percent of contract research expenses. While such costs do not qualify for a credit, they are often fundamental to carrying on the qualified part of research and experimentation. From the $39.7 billion of qualified spending, $1.5 billion in tentative credits were generated, as illustrated in Figure 10. This implies an average tentative credit equal to 3.8 percent of qualified R&E spending ($3.80 for each $100 spent on qualified R&E), or 1.9 percent of total R&D spending, before recognizing the effects of foregone deductions, the General Business Credit and the Alternative Minimum Tax. The average effective rates of tentative credit for major industry groups are presented in Figure 11.

A recent analysis by the U.S. General Accounting Office, concluded that the credit does little or nothing to stimulate additional R&D by highly research-intensive startup companies (such as biotechnology companies) when they have no current tax liability due to net operating

losses and/or large loss carryforwards.[27] Their reasoning is that companies with no prospect of claiming the earned credits in the current year or in the near future will have to carry their credits forward several years, making their impact on the present value of a company's cash flows minimal. This conclusion fails to recognize that, under current financial accounting standards, the R&E credit can be a powerful tool even for firms in a loss-carryforward position — especially startup companies. Under FAS 109, companies may recognize in computing their after-tax earnings the value of credit carryforwards in the current year, even though the cash benefit may be deferred a number of years. Thus, the current and future availability of the credit increases current and expected future after-tax earnings, making equity financing more accessible. The cost of equity financing can be a critical determinant of R&D decisions of companies engaged in long-term, high-risk R&D with little or no current sales, since their R&D is funded largely by new equity. For such companies, the loss of the R&E credit would likely translate directly into reduced access to capital markets and, as a result, fewer technological breakthroughs.

[27] Tax Policy: Pharmaceutical Industry's Use of the Research Tax Credit, Report to the Chairman, Special Committee on Aging, U.S. Senate (GAO/GGD-94-139), May 1994.

Figure 11: Average Effective Rates of Tentative Credit, by Industry, 1991



Source: Statistics of Income Division, Internal Revenue Service

VII. THE IMPORTANCE OF PERMANENCE

Permanence is necessary to realize the full effectiveness of the R&E credit. It is important to realize that R&D funding decisions involve consideration of the long-term costs and benefits of multi-year research projects. Research plans have long horizons and long gestation periods. They are also generally risky investments — all the more so because of their long-term nature. The lags between the planning of R&D investments and their ultimate payoff (if successful) tend to be longer the more basic is the research. Furthermore, firms appear to face longer lags in adjusting their R&D plans compared, for example, to adjusting their investments in physical capital. In order to increase their R&D efforts, companies must search for and hire more scientists, engineers and support staff. They must often invest in new physical plant (such as special purpose laboratories) and equipment (such as computers and scientific instruments). This can be costly and time-consuming.

In the pharmaceutical and biotechnology industries, the duration of the research process itself is compounded by the lengthy process of clinical trials and FDA approval. This may add years to the overall process of bringing an innovation to market. For highly competitive industries such as computer software, electronics and semiconductors, the effects of long gestation on the R&D decision process may be compounded by relatively short pay-back periods: new products can quickly become obsolete, or must be continually improved through an on-going research program. In addition, there is some evidence in studies of the credit's effectiveness indicating lags of several years in the adjustment of companies to R&D tax incentives.[28] This lag appears mainly to be due to the long-term nature of R&D plans. The average lag in the adjustment of R&D spending in the U.S. to changes in the cost of R&D is about five years, with only about one-fourth to one-third of the adjustment taking place in the first year. This contrasts with an adjustment lag of about three years, on average, for investments in physical capital.[29]

In the context of such long-term planning, business managers will discount the future benefits that may be realized from the R&E credit when its future availability is uncertain. Businesses have no way of knowing for sure what the incentive effect of the credit will be over the lifetime of a project. The more uncertain is the long-term future of the credit, the smaller is its potential to stimulate increased research. This effect can be illustrated in simple capital-budgeting terms. Companies frequently evaluate prospective investments by looking at the present value of net cash flows expected from an investment over future years. Estimates of future cash flows must take into account the likelihoods of the various potential future circumstances that affect cash flows, such as the potential availability of tax credits. Tax credits

[28] Both Eisner, et al., and Hall, op Cit., report very low responsiveness of R&D spending in the initial year or two of the R&E credit, but an increased responsiveness in subsequent years.

[29] See, for example, Pierre A. Mohnen, M. Ishaq Nadiri and Ingmar R. Prucha, "R&D, Production Structure and Rates of Return in the U.S., Japanese and German Manufacturing Sectors," European Economic Review Vol. 30, 1986, 749-771.

for R&E lower the cost of R&E in each year that the credits are available, thus increasing the net cash flows per year from an R&E investment. However, the lower is the perceived probability that tax credits will be available in future years, the smaller will be the expected value of the future cost reductions, implying smaller expected future net cash flows, and thus lower expected rates of return on R&E investments. Therefore, the lower is the likelihood that R&E tax credits will be available in the future, the fewer will be the prospective R&E investments that meet a given company's investment profitability criterion. More uncertainty over future tax credits translates directly into fewer dollars being spent today on research and experimentation. The size of this uncertainty effect, however, is unknown. Measuring it would require very detailed data on individual companies' prospective R&E investment projects.

The increasingly erratic legislative treatment of the credit since its first renewal in 1986 has increased this uncertainty. It may have been prudent initially for the Congress to adopt the credit as a temporary measure in order to determine its effectiveness, but the recent economic evidence no longer supports a continued wait-and-see approach. Fiscal constraints may be partly responsible for the irregular cycle of short-term renewals. However, it must be recognized that continuing to adopt an on-again, off-again short-term approach to stimulating long-term research is ultimately a more costly and less efficient policy than permanence. The current short-term approach to subsidizing long-lasting R&D investments imposes unnecessary additional risks and costs on R&D-performing companies, and reduces the policy's effectiveness.

VIII. THE CREDIT'S STRUCTURE

The current structure of the R&E tax credit is generally effective at providing incentives for research-intensive companies, but there are certain circumstances where the current structure of the credit and its interaction with other provisions of the Internal Revenue Code limit its incentive effect for some companies. While this study makes no recommendation on how these constraints should be addressed, it may be useful for policymakers to focus on whether or how to enhance the incentive effect and increase the utilization of the R&E credit.

Under current law, a company's R&E tax credit is computed as 20 percent of either (a) the excess of qualified R&E (QRE) spending for the tax year over the company's computed base amount or (b) one-half of its QRE, whichever is smaller. A company's current-year base amount is computed as the product of its average gross receipts ('sales') for the prior four years and its 'fixed-base percentage.'[30] The fixed-base percentage equals the ratio of the company's QRE to its gross receipts for the period 1984 to 1988 (the 'base period'), and is capped at 16 percent. Under current law, there is no provision for altering the base period as a company's characteristics and business conditions change.[31] The credit, therefore, is effectively based on a company's current ratio of QRE to sales relative to what that ratio was for the 1984 to 1988 base period.

There are at least three general categories into which 'disadvantaged' research-performing companies fall. In each of the cases the companies' R&E spending is continuing to grow, and may even be growing at a faster rate than in past years. Nevertheless, they are unable to earn R&E credits. Since these companies are continuing to exert significant research effort, it is worth examining why the tax credit does not reward their efforts and encourage them to do more. First, there are those whose R&E intensity has fallen due to a short-lived jump in the growth rate of sales. Other things held constant, a temporary increase in the growth rate of sales for just a few years — due, for example, to a drug company's releasing a blockbuster new drug — has the effect of permanently lowering the company's QRE-to-sales ratio. The higher growth rate may be short-lived due to eventual competition from other new drugs and/or from generic versions of the same drug. The result of the fall in the company's QRE-to-sales ratio is that its R&E tax credits immediately start to fall in the first year of higher sales growth, and completely disappear within two or three years.[32] This holds true even if the sales growth rate returns to its

[30] We will use the terms 'gross receipts' and 'sales' interchangeably.

[31] An exception is provided for 'start-up' companies, which are assigned a fixed-base percent of 3 percent for the first five years, with a gradual phase-in of the regular rules over the following five years.

[32] The conclusions in all three cases are based on simulations we have conducted of the amount of credit generated by hypothetical companies under various scenarios for the growth rates of sales and QRE. The simulations postulate time-paths for gross receipts and qualified R&E spending for the years 1984 to 2000. The growth rates assumed are based on the experiences of actual publicly traded companies listed in Standard & Poor's Compustat database. We applied the tax credit computations specified under current law to calculate the amount of tentative credits that would be earned by the company in each year.

previous lower level.[33] From the company's perspective, the short-term growth spurt has no impact on the rates of return of prospective future R&E investments. Therefore, it is not generally reasonable to expect the company to simultaneously increase the growth rate of its R&E spending to match the increased sales growth — especially if research projects have lead times of one or two years.

Second, there are those whose R&E intensity falls over time as a natural part of the company life-cycle — evolving from an immature, highly R&D-intensive company with few products on the market to a mature corporation with many products and steady sales growth. This scenario applies to certain biotechnology/biopharmaceutical companies. 'Emerging' biotech companies may invest 25 percent or more of their sales in qualified R&E each year for many years until they get products on the market.[34] Years of clinical trials plus delays due to the FDA approval process, in addition to the years of actual research and development, may pass before a product can be marketed. In such a case, the company's base is set at 16 percent of gross receipts. While this 16-percent ceiling is initially advantageous for a company with an actual QRE-to-sales ratio much higher, it becomes a disadvantage as the company matures. As a natural result of successful R&D, salable products go to market and such a company's QRE-to-sales ratio will typically fall over time. If the company's QRE-to-sales ratio settles at below 16 percent, then it will never be able to earn credits once it matures. Having a fixed base frozen at 16 percent of gross receipts may present the mature company with an impossibly high spending target for earning tax credits, thus eliminating the intended incentive effect.

Third, there are companies with several diverse product lines whose company-wide R&E intensity has fallen due to a change in the product composition of its total sales. For example, the total company-wide sales of a large computer company may come from a combination of personal computers, mainframe computers, printers, disk drives, software, scientific instruments, product service, and so on. Each product line may have its own particular growth rates for sales and R&E spending and, thus, each has its own particular QRE-to-sales ratio. The company-wide QRE-to-sales ratio is the sales-weighted average of the individual product-line ratios. Therefore, the greater is the fraction of total company sales that is due to a given product line, the greater is the influence of that line's ratio on the company-wide ratio. It is the company-wide QRE-to-sales ratio which determines how much R&E credits the company may qualify for.

The problem, simply put, is this: if the company's sales mix tilts over time away from higher-R&E-intensity products toward lower-R&E-intensity products, then the R&E intensity of the company as a whole will decline, jeopardizing the company's ability to earn tax credits for its research in *all* of its product lines. This may occur due to market-driven circumstances that are beyond an individual company's control. This may happen, as well, simply as a result of success — as in the previous two cases. Even though the growth rate of R&E spending in each product

[33] On the other hand, if the company were unfortunate enough to have its sales growth rate fall below its R&E spending growth rate, it would eventually start to earn tax credits.

[34] So-called emerging companies should not be confused with start-up companies, which fall under special rules for the fixed-base percentage computation. An emerging company may have been in existence for several years prior to 1984, yet still be in the middle stages of maturity (due to the long product gestation periods).

line is stable, or even increasing, a period of rapid sales growth in one product line may reduce the QRE-to-sales ratio of the whole company and jeopardize its R&E credit status.

In summary, for certain companies, the fixed-base percentage assigned under the current 1984 to 1988 base period is too high to provide a research incentive, given the change in their business conditions since this base period. These companies currently do not earn, or soon will not earn any R&E credits even though they may continue to increase their R&E spending. Therefore, they receive no incentive for further increases in R&E.

Whether or how these structural problems should be resolved is far from clear. Some solutions may create new structural problems of their own, while other solutions could trigger large Treasury revenue losses. The structural problems are serious impediments to expanded R&D efforts for some companies and deserve careful study. However, given the June 30, 1995, expiration date of the current tax credit and the unambiguous benefits of a permanent extension of the credit, policymakers should not delay legislative action to resolve these structural issues.

IX. CONCLUDING REMARKS

While the growth rate of U.S. R&D spending — both total and non-defense — increased after enactment of the R&E tax credit in 1981, its growth rate slowed after 1986. This slowdown coincided with the narrowing of the definition of qualified research spending, the reduction in the statutory credit rate, the inclusion of the credit in the General Business Credit, the partial disallowance of R&E expense deductions, and the increase in the uncertainty surrounding the future availability of the credit. It may also be related in part to the general slowing of U.S. economic growth and shrinking of the manufacturing sector in the late 1980's. As R&D spending growth has slowed, the U.S. has fallen farther behind both Japan and Germany in terms of non-defense R&D intensity.

The R&E tax credit has successfully stimulated additional private research activity by reducing the after-tax cost to businesses of conducting research. Thus, the credit passes the two key tests of public policy success: it is supported by sound economic arguments, and it has proven effective in changing economic behavior in the desired manner. Nevertheless, the cycle of irregular and uncertain short-term extensions of the credit has probably made the credit less effective than it could have been. A continued unpredictable, short-term policy approach to influencing inherently long-term R&D investment decisions does not best serve the policy goal of increasing R&D spending. In order to achieve the greatest possible effectiveness and 'bang for the buck,' the R&E tax credit should be made permanent.

APPENDIX: HISTORY OF THE R&E TAX CREDIT

Since its original enactment as part of the Economic Recovery and Tax Act of 1981, the R&E tax credit has been modified four times and extended six times. The credit is currently scheduled to expire on June 30, 1995. It originally contained the following provisions:

- It equaled 25 percent of the qualified R&E expenditures that exceeded a base amount.
- The base amount equaled the average expenditures for the three previous years, or 50 percent of the current year's expenditures, whichever was greater.
- It contained a three-year carryback and 15-year carryforward provision.
- It was effective from July 1, 1981, through December 31, 1985.
- The credit excluded from the definition of qualified research any research done outside the United States, research in the humanities or social sciences, and research funded by another person or governmental entity.

The original R&E credit expired December 31, 1985. It was renewed retroactively the following October by Tax Reform Act of 1986. This Act modified the tax credit by more narrowly defining qualified expenditures, clarifying that the research was to be technological in nature. In addition, the Act

- reduced the credit to 20 percent of qualified research expenditures;
- excluded expenses of leasing personal property;
- established a separate 20 percent credit for payments to a university for basic research;
- made the credit part of the General Business Credit, thus subjecting it to a yearly cap; and
- made the tax credit effective from January 1, 1986, to December 31, 1988.

The Technical and Miscellaneous Revenue Act of 1988 extended the credit for one year. It also reduced deductions allowed under Sec. 174 for qualified R&E expenses by 50 percent of the credit determined for the year. In this way, taxpayers were limited in their ability to benefit twice from the same R&E expenditure.

The Omnibus Budget Reconciliation Act of 1989 removed the original three-year rolling average method of computing the base. This original formulation of the base had the effect of reducing the incentive for companies to undertake additional R&E spending: Under the three-year rolling average, R&E spending in a given year raised the taxpayer's base for the following years, thus lowering the credit the taxpayer would receive in subsequent years. Specifically, the 1989 Act contained the following provisions:

- The three-year rolling average was replaced by a base amount equal to the taxpayer's ratio of total qualified R&E expenses to total gross receipts for the period 1984 to 1988 (the 'fixed-base percentage'), multiplied by the average of the taxpayer's gross receipts

for the preceding four years. In no case will the fixed-base percentage exceed 16 percent. The base must still be no smaller than 50 percent of qualified R&E expenses.

- 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 three years between 1984 and 1988 were assigned a fixed base of 3 percent.
- The deduction allowed under Sec. 174 for qualified R&E was reduced by 100 percent of the R&E credit determined for the year (rather than the 50 percent reduction established in 1988).
- The Act effectively extended the credit for nine months by prorating qualified expenses incurred before January 1, 1991.

The Omnibus Budget Reconciliation Act of 1990 extended the credit through December 31, 1991, and repealed the special proration rule provided for by the OBRA of 1989. However, due to an apparently inadvertent drafting error, the special proration rule continued to apply to taxpayers with fiscal years ending in the fourth quarter of 1989.[35] The result was that such taxpayers ended up losing out on up to three months' worth of R&E credits (with the exact loss depending on the particular date of their taxable year end). A technical correction to this problem has been pending for several years (as part of a larger technical corrections bill). The correction was included in the House-Senate conference agreement for HR 11 in 1992, but the bill was vetoed by President Bush. It was also included in HR 3419, as reported out of the Ways and Means Committee, in 1993. The correction has not yet been passed into law.

The Tax Extension Act of 1991 extended the credit through June 30, 1992. The tax credit was then allowed to expire in 1992, and was subsequently renewed retroactively by the Omnibus Budget Reconciliation Act of 1993, which made the credit effective from July 1, 1992, through June 30, 1995. The Act also modified the fixed-base percentage for start-up companies by assigning them a fixed-based of 3 percent for each of their first five taxable years after 1993, and providing for a gradual five-year phase-in period after the fifth tax year. After the tenth year, the taxpayer's fixed-base percentage becomes the actual ratio of qualified research expenditures to gross receipts for any five years selected by the taxpayer from the fifth through tenth tax years.

[35] The provisions of the 1990 Act that repealed the special nine-month rule were made effective so as to apply only to taxable years beginning after December 31, 1990. The nine-month rule included in the 1989 Act, however, applied to taxable years beginning after October 1, 1989 and before October 1, 1990. As a result, the effective date of the repeal did not apply to taxpayers with taxable years ending in the fourth quarter of 1989. All other taxpayers with taxable years ending in 1990 are covered by the effective date in the 1990 Act.

PREPARED STATEMENT OF DR. MARTIN A. SULLIVAN

Good Morning Mr. Chairman and distinguished Members of the Subcommittee. My name is Martin Sullivan. I am a self-employed economist and an Adjunct Scholar at the American Enterprise Institute. It is an honor to be here today and I hope my views will be helpful to you.*

1. OVERVIEW

Research and development—like education and training, investment in plant and equipment, and adequate supplies of natural resources—is a critical component of U.S. economic growth and competitiveness. Because the output of research is technology and knowledge, all of the benefits of research are not necessarily embodied in products sold by the firm investing in research. Sometimes research by business adds to the body of scientific knowledge but not necessarily to increased profits. Sometimes research performed by one company cannot be translated into increased profit for that company, but can be utilized by other companies—perhaps, even competitors of that company. Thus, it is entirely possible that private sector left to its own devices will make less investment in research than is beneficial to the economy as a whole.

Because of this problem, the government's role with regard to research is an exception to the general rule that the free market works. When it comes to research, government intervention may actually improve economic efficiency. The Federal government provides incentives for research through the patent laws, through direct spending on research, and through favorable anti-trust rules.

Incentives are also provided through the Internal Revenue Code. One tax incentive for research is availability of expensing for investments in research. Expensing of research costs has been a permanent fixture of the Internal Revenue Code since 1954. A second incentive is tax credit for research. The Research and Experimental ("R&E") Tax Credit was originally enacted as part of the Economic Recovery Tax Act of 1981 and has been temporarily extended multiple times. The R&E credit is currently scheduled to expire on June 30, 1995.

In the face of widespread criticism about the effectiveness of the credit for increasing research spending, the credit was substantially restructured by the Omnibus Reconciliation Act of 1989. There is general agreement that the post-1989 formulation of the credit provides much greater incentive effects than prior law. However, while there is little dispute about the relative effectiveness of the two types of credit, there is no certainty as to the absolute amount of incentives provided by either. The economics profession does not provide definitive evidence about the responsiveness of research to changes in taxes.[1]

However large the incentive effects, there is no doubt that the credit's effectiveness will be increased by reducing uncertainty. If the credit is to be extended, it should be extended as soon as possible, and it should be extended permanently.

When the credit was restructured in 1989, there was a broad consensus that this was appropriate given the credit's small incentive effects. Whether or not the R&E credit should be restructured in 1995 is a tougher question, and the remainder of this statement will focus on this issue.

2. BACKGROUND ON DIFFERENT CREDIT STRUCTURES

A. Flat versus Incremental

Tax credits may be divided into two general categories: flat and incremental. Under a flat credit structure, the amount of research credit is calculated as a percentage of total qualified research expenditures. Under an incremental credit, the amount of research credit is calculated as the excess of qualified research expenditures over a base amount.

A flat credit is more simple and straightforward than an incremental credit. (This is particularly true in cases concerning corporate acquisitions and dispositions, and start-up companies.) Furthermore, because a flat credit would be available to all firm's investing in qualified research, a flat credit would generally provide uniform incentives for all firms that perform research. However, a flat credit may not be particularly effective in providing economic incentives when the revenue cost of the credit must be limited.

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*The views expressed in this statement are those of the author and do not necessarily reflect those of the American Enterprise Institute.

[1] For an overview of economic evidence on the price elasticity of research, see James R. Hines, Jr., "No Place Like Home: Tax Incentives and the Location of R&D by American Multinationals," in James M. Poterba, ed., *Tax Policy and the Economy*, 1994, Cambridge: MIT Press.

For a tax credit to be effective in increasing a taxpayer's research expenditure, it is not necessary to provide that credit for all the taxpayer's qualified research expenditures. Most research spending would occur irrespective of the availability of tax credits because, after taking into account risk, these projects have high expected profitability. Tax credits are most cost-effective when they do not reward projects which would have been undertaken in any event. If tax credits are focused on projects of borderline profitability, they can have the greatest impact for the least revenue cost.

Unfortunately, it is impossible in practice to determine in advance which research projects have borderline profitability and what amount of expenditures would be undertaken in the absence of an incentive. As an approximation, incremental credits use some measure each taxpayer's prior experience as a reasonable guess as to what might be undertaken in the absence of the credit. This approximation is the credit's base amount.

To the extent that incremental credits target benefits to expenditures that would have not otherwise been undertaken, incremental credits have the potential to be far more effective in terms of incentive per dollar of revenue cost than flat credits in inducing taxpayers to increased qualified expenditures.

B. Incremental Credits: Moving- versus Fixed-Base

Since its inception in 1981, the R&E credit has always been an incremental tax credit. From 1981 until its restructuring in 1989, the R&E credit had a base amount equal to a moving-average of previous qualified research. Generally, the base amount for any taxable year equaled average qualified expenditures in the three prior taxable years. Despite its incremental nature, this type of moving base credit was widely criticized as providing small and uneven incentives, and the poor performance of the pre-1990 credit has been widely documented.[2]

Under the prior-law moving base structure, any additional R&E increased tax credits in the current year, but these additions also increased the base amount in each of the following three years. Thus, an additional dollar of current year R&E increased tax credits by 20 cents in the current year, but reduced credits by 20 cents over the course of the following three years spread over the following in the following year. The net benefit in present value for each additional dollar of R&E was approximately 2 or 3 cents. These small incentives effects, as well as several other problems, make it clear that a moving-base incremental credit should not be considered a serious alternative.

Under a fixed-base credit structure, the base amount is not altered by current or future spending on research. Thus, when a firm increases its research spending, incentive is provided at the full rate of credit with no negative tax impact in later years. Under current law, the credit provides 20 cents of tax reduction for each dollar of R&E spending in excess of a fixed base amount. For each firm, the base amount is average spending on research over the 1984-88 period indexed to the firm's growth in sales. Thus, a firm is rewarded for increasing research spending over the amounts its spent in the mid-1980s adjusted for firm size.

3. DIFFERENCES IN THE INCENTIVE EFFECTS PROVIDED BY A FLAT AND CREDIT AND BY AN INCREMENTAL CREDIT

A measure known as the effective rate of tax credit is used to evaluate the incentive effects of tax credits. The effective rate of credit is percentage reduction in cost of an additional dollar of research due to a tax credit.

For most firms—those firms with growth in R&E above or at least roughly equal to growth in sales—the effective rate of credit under current law is 20 percent. This far exceeds the incentive effect of a flat credit of equal revenue cost. For example, suppose a firm has annual growth in sales and research of 7 percent. Under current law, this firm would receive 20 cents of tax subsidy for each dollar of additional R&E. Under a flat credit of approximately equal revenue cost), the firm would receive approximately 3 cents of tax subsidy for each additional dollar of R&E.

However, if a firm has growth in R&E that is not commensurate with its growth in sales, the firm may find that it will soon not be eligible for the credit. For example, suppose a firm has always had annual growth in research of 7 percent but since 1989 has enjoyed sales grow of 10 percent. Under current law, this firm would not be eligible for any tax credit in 1995 or in any year afterward. Under a flat credit of approximately equal revenue cost, the firm would receive 3 cents of tax subsidy for each additional dollar of R&E.

[2] See, for example, Robert Eisner, Stephen H. Albert, and Martin A. Sullivan, "The New Tax Credit for R&D: Incentive or Disincentive," *National Tax Journal*, 1984, Vol. 37, pp. 171-183.

Under current law, the credit is subject to a 50 percent base limitation. In essence, this base limitation cuts the effective rate of credit in half for firms that have rapid growth in R&E relative to sales. For example, suppose a firm has always had annual growth in research of 7 percent but since 1989 had annual sales declines of 2 percent. Under current law, this firm would face the base limitation and its effective rate of credit would be reduced from 20 to 10 percent. Under a revenue-neutral flat credit, this same firm would receive approximately 3 cents of tax subsidy for each additional dollar of R&E.

As we can see from the three above examples, under the current law incremental credit structure, a firm's effective rate of credit depends on its current research intensity—as measured by the ratio of research to sales—relative to its intensity over the 1984-88 base period. This is summarized in the following table.

Table 1. Comparison of the Effective Rate of Credit Under a Flat and Incremental Structure*

	Current R&E-to-Sales Ratio Compared to 1994-88			
	(A) Significantly Lower	(B) Similar or Higher	(C) Significantly Higher	Estimated Weighted Average**
Current Incremental Credit	0%	20%	10%	Approx 15%
Flat Credit	3%	3%	3%	3%

*This table assumes a revenue neutral flat credit is 3 percent, and ignores relatively minor effects of deferral in use of the credit due to lack of regular tax liability.

**Here it is assumed that 20 percent of R&E is performed by firms is not eligible for the credit because these firms are below base, and that 7 percent of all R&E is performed by firms facing the 50-percent base limitation.

As noted above, under a flat credit all firms performing research are eligible for the credit and receive the same amount of credit. However, the rate of effective credit is relatively small.

The last column of the table provides my best guess as to economy-wide average incentive effect. Since most firms do indeed maintain research-to-sales ratios similar or somewhat larger than those they has in 1984-88, most firms fall into the intermediate category where the effective rate of credit is the full 20 percent. Clearly, *in terms of pure aggregate incentive effect, the current credit structure is superior to a flat credit.*

One word of caution should be interjected here. It can be expected that over time, fewer and fewer firms will fall into category B and more and more firms will fall into categories A and C. This is because the relevance of the 1984-88 period will become an increasingly inaccurate measure of what is an appropriate base. Thus, it is likely that with the passage of time less firms will be eligible for the credit and the average effective rate of credit will decline even as the revenue costs of the credit increase.

4. THE ISSUE OF COVERAGE: THE HAVES AND THE HAVE NOTS

A. Reasons Firms Become Ineligible

There are many reasons why firms reduce their research expenditures relative to sales. Firms may have decided for good business reasons to expand, either through direct investment or acquisition into a low-tech business. For example, a manufacturer may decide to move into distribution of its products. This natural business move would substantially increase sales without a commensurate increase in research. This could easily cause a firm to be permanently shut off from receiving any research credits. (Conversely, a company that spins off its distribution arm and decide to focus on manufacturing would receive windfall benefits under the current credit structure without any increase in research spending.)

A firm may find it difficult to receive credits because the 1984-88 period were not particularly good sales years. Thus, its 1984-88 research-to-sales ratio is extremely high and cannot be indefinitely maintained. This is particularly the case for firms that were starting up during the 1984-88 period or otherwise had rapid research growth of that period.

While these are not the only reasons for firms being ineligible for the credit, they do illustrate that in many cases the 1984-88 base period is not an appropriate measure of what economists would like the base amount to be, i.e., the amount of R&E that a firm would undertake in the absence of a credit.

B. The Perception of Unfairness

There is much in the current structure that may be perceived as unfair. Take the example of two firms that both spend a $50 million dollars in 1995. One firm might receive $5 million in tax credits while the second receives nothing. This enormous difference is entirely attributable to the difference in their activities during the 1984-88 base period. While both of these firms may equally endeavor to increase research, the second may never be able to earn tax credits. The irony is that this firm is penalized for having high levels of 1984-88 research while the firm now receiving credit does not.

C. Economic Inefficiency of Uneven Incentives

Besides increasing the overall amount of research spending, it is also desirable that the R&E tax credit provide an incentive that is uniform across industries and across firms. A uniform research incentive promotes economic efficiency by encouraging firms to invest in the most productive research projects. Certainly, lack of uniformity is a serious problem under the current incremental credit and this problem is only likely to increase over time. By unlucky circumstances, some firms may find themselves ineligible for the R&E while their competitors receive large amount of credit. Resources may be improperly allocated in the economy as some firms are unable to receive any credit while others receive large amounts despite the fact that both their research programs are equally deserving of support.

As seen from the above chart, this will not be the case with a flat credit. Under a flat credit, the incentive effect may be small, but it is even. It does not distort the allocation of resources across industries and does not result in unfair competition within industries.

5. COMMENTS ON POSSIBLE ALTERNATIVES

With regard to the R&E credit, the two options most discussed are extending the current incremental structure and replacing the current structure with a flat credit. It is my judgment that neither option will be particularly attractive over the long term.

As noted before, the current credit is extremely cost effective. However, an extension of the current credit would result a wide disparity in tax benefits and tax incentives received by different firms. This is unfair and inefficient. And it is likely that these negative features will become increasingly prominent over time.

The second most frequently discussed option is a flat credit. This type of credit is simple, provides uniform incentive, and distributes tax benefits in proportion to research spending. But its low incentive effects leaves it extremely vulnerable to criticism.

I will hazard a guess that a compromise between extension of current law and flat credit would be superior to either individually. Under such a compromise the incremental rate would have to be reduced below 20 percent—perhaps to 16 or 12 percent—and a flat credit of approximately 2 percent would be allowed as an option. Under this credit structure, all firms would receive some credit. Incentive effects would significantly less than current law, but significantly more than under a flat credit. Economic distortions would still exist, but they would be less than under current law because all firms would receive at least some credit. This credit is not perfect, but it is probably the best that can be done.

If the credit cannot be made permanent, its incentive effects are diminished, and the arguments in favor of extension are also diminished. In this case, allowing the credit to expire and pocketing the $2 billion annual revenue saving for deficit reduction should be given serious consideration.

PREPARED STATEMENT OF THE BUSINESS SOFTWARE ALLIANCE

The Business Software Alliance ("BSA") is pleased to have the opportunity to submit its views on the research and experimentation tax credit, commonly referred to as the "R&D Credit." The BSA represents the leading U.S. publishers of PC software, including Autodesk, Bentley Systems, Intergraph, Lotus Development Corporation, Microsoft Corporation, Novell, Inc. and the WordPerfect Applications Group, Sybase, and The Santa Cruz Operation. The BSA promotes the continued growth of the software industry through its international programs in the United States and more than 60 countries throughout North America, Europe, Asia and Latin America.

The BSA strongly supports the permanent extension of the existing R&D Credit, which is set to expire June 30, 1995. The structure of the current R&D Credit works well for the BSA members. For these reasons, the BSA urges Congress to enact S. 351, introduced by Subcommittee Chairman Orrin Hatch and Senator Max Baucus, which will permanently extend the current R&D Credit.

The computer software industry is the fastest growing major industry in the United States. The industry is now larger than all but five manufacturing industries. Moreover, U.S.-developed software dominates in the global marketplace. U.S. companies hold about 75 percent of the global market for mass market software.

The U.S. software industry's success and its prospects for continued growth are closely related to its ability to develop new and technologically innovative products and services. It is estimated that the software industry spends as much as fifteen percent of its annual revenues on R&D related activities. Since its inception in 1981, the R&D Credit has provided a valuable economic incentive for U.S. software companies to increase their investment in R&D in order to maintain their competitive edge in global markets.

Although the development of new technologies in the software industry takes place at an accelerated rate, the underlying R&D necessary to develop new technology is an ongoing, long-term undertaking, often involving projects taking as long as five or more years. For this reason, making the credit permanent will make the credit a more effective tool for software companies because it will enable them to rely on the credit in planning R&D projects. Moreover, a permanent credit will better enable the software industry to remain a strong international competitor since many of its foreign competitors have the advantage of receiving significant R&D tax benefits without facing the difficulty of the benefits expiring or lapsing temporarily as has been the history of the U.S. R&D Credit.

The R&D Credit was enacted in 1981 to provide an incentive for companies to increase their spending on domestic R&D. The credit was designed to encourage industry to increase R&D and accordingly applies only to increases in R&D above a specified base amount. The credit only applies to domestic spending and applies primarily to wages for direct R&D jobs such as researchers, scientists, engineers and their assistants. Management compensation is not generally eligible for the credit. The credit cannot be claimed for other expenses such as fringe benefits or other infrastructure expenses unrelated to direct R&D activities such as plant, equipment, etc.

The R&D Credit has been extremely successful in stimulating private sector R&D, particularly in the software industry. A recent economic study concludes that the marginal effect of one dollar of the R&D Credit stimulates one dollar of additional private R&D spending over the short-run and as much as two dollars of entire R&D over the long run. Further, the benefits of research accrue not only to the companies undertaking the research but also downstream to all areas of business and society. In short, R&D efforts significantly contribute to productivity growth, improve the

competitiveness of U.S. companies and advance the standard of living for all U.S. citizens.

Despite its success, the incentive benefits of the R&D Credit have been reduced because of its temporary and uncertain nature. In the software industry as in other industries, many product development initiatives and research projects have significant long lead times and business decision makers are hesitant to fully factor in the credit's benefits in light of the uncertainty over the long-term availability of the credit. History has shown that their hesitancy is well-founded. On two occasions, the R&D Credit actually was allowed to expire only to be renewed retroactively. On another occasion, the credit was renewed for only six months. This pattern greatly restricts the ability of corporate managers to plan long-term projects and reduces the incentive value and overall effectiveness of the credit. To maximize the incentive value of the credit, it must be extended on a permanent basis.

In closing, the BSA would again like to thank Chairman Hatch and the members of the subcommittee for providing the BSA with the opportunity to present its views on the R&D Credit. The BSA looks forward to working with the Chairman and the subcommittee in enacting S. 351 to permanently extend the current R&D Credit.

STATEMENT OF THE CHEMICAL MANUFACTURERS ASSOCIATION

The Chemical Manufacturers Association (CMA) is a nonprofit trade association whose member companies represent more than 90 percent of the productive capacity of basic industrial chemicals within this country. We welcome this opportunity to submit the views of the U.S. chemical industry on (1) the importance of extending the research and experimentation tax credit ("research credit") before it expires on June 30, 1995, and the need to make the research credit permanent; and., (2) the need for a legislative solution for the current law rules requiring the allocation of expenses for research and development conducted in the United States between U.S. and foreign source income.

The U.S. chemical industry has a vital interest in the continuing search for ideas that will contribute to future expansion of productive capacity and new job opportunities in the United States. In 1994, our industry spent an estimated $18.1 billion for research, more than twice the amount expended in 1984. Moreover, the chemical industry ranks first among all U.S. manufacturers in research and development spending.

Over the past several years the U.S. chemical industry has been shifting from production of basic commodity chemicals toward production of new specialty chemicals that have evolved from continuing research and development. Research and development is also important to the U.S. chemical industry not only because it leads to the discovery of new, patent protected products, but because it leads to increased productivity which can overcome labor and capital cost disadvantages.

Although the fundamental nature of the U.S. chemical industry is changing, it continues to provide high-tech, high-wage jobs for more than 1 million U.S. workers. Moreover, the chemical industry continues to be a strong positive contributor to U.S. trade performance. As you know, our nation's merchandise trade balance in 1994 showed a $151.3 billion deficit, but exports of chemicals totaled $51.5 billion and exceeded imports by $18.3 billion. The strong export position of the U.S. chemical industry is, however, very much dependent on maintaining the productivity gains and stream of new products that derive from a large, effective private sector research effort.

On several occasions over the past 15 years, CMA has appeared before this committee to support the extension and improvement of tax incentives for U.S. research and development. The reason for these incentives is fundamental: research and development activities form the basis for new products, new markets, and increased economic productivity. Without these activities, the competitiveness of both the United States and the U.S. chemical industry will decline. For valid reasons, industrialized nations typically offer strong incentives for research and experimentation expenditures. Nations that develop new science and technology are normally those in which the new technology will be first employed and new plants and new jobs will be created. Since U.S.-based production has relatively high labor and capital costs, incentives for research and development offer the most appropriate means to offset these competitive disadvantages.

The research credit was enacted in 1981 to provide these incentives. But let us consider its history to date.

In 1981 the research credit equaled 25 percent of the excess of qualified research expenses in the current year over a moving average of such costs in the three prior taxable years. That research credit expired in December, 1985, but the Tax Reform

Act of 1986 retroactively extended it on a modified basis through 1988. The 1986 legislation reduced the research credit rate from 25 percent to 20 percent, tightened the definition of qualifying expenses, and modified the university basic research credit. The Technical Amendments and Miscellaneous Revenues Act of 1988 extended the research credit at 20 percent through December 31, 1989. The Act also reduced the deduction under Section 174 for qualified research expenses by an amount equal to 50 percent of the research credit for that taxable year. The Omnibus Budget Reconciliation Act of 1989 extended the research credit through December 31, 1990, replaced the moving average base period with a fixed-base percentage, and increased the Section 174 deduction disallowance to 100 percent of the research credit claimed for that year.

In the Omnibus Budget Reconciliation Act of 1990, Congress extended the research credit through December 31, 1991. The credit was subsequently extended to June 30, 1992, in the Tax Extension Act of 1991. Most recently, the Omnibus Budget Reconciliation Act of 1993 extended the research credit from July 1, 1992 until June 30, 1995.

CMA believes that the research credit should be improved and made permanent and has consistently expressed this position since 1981. The credit has contributed significantly to the continuation and expansion of research programs in general (cf., the 1994 study "Extending the R & E Tax Credit: The Importance of Permanence," by R.G. Penner, L.C. Smith, and D.M. Skanderson of the Policy Economics Group, KMPG Peat Marwick), and to the health and prosperity of the United States chemical industry in particular. The chemical industry has a vital interest in the continuing search for ideas which will contribute to future expansion in new technology, processes, production, and the development of new job opportunities in this country. The industry is in the forefront of U.S. research-oriented activities.

As a nation, we need a strong private sector research establishment. New technology is a primary source of continued economic growth and the basis for future increases in productivity and living standards. It is imperative that U.S. policy encourage domestic research activity. Research programs typically require long lead times, and the uncertainty about the future that results from short-term extensions of the research credit are detrimental to new research programs.

CMA believes that a permanent extension of the research credit would be a significant start on the job that needs to be done. While the present research credit could be improved by expanding its coverage, at a minimum, Congress should adopt a permanent research credit now. Until that is done the real economic incentive the research credit can provide is substantially reduced.

CMA also strongly believes that a permanent solution to the almost 18-year controversy over Treas. Reg. 1.861-8(e)(3), the research and development ("R & D") expense allocation rules, is also critically needed. Treas. Reg. 1.861-8(e)(3) works at cross purposes with the research credit because it provides a disincentive to conduct research in the United States.

Since 1981, Congress has adopted a statutory moratorium on seven occasions to prevent the allocation of R & D expenses between U.S. and foreign source income that otherwise would be required under Treas. Reg. 1.861-8(e)(3). These include amendments to ERTA (1981), DEFRA (1984), COBRA (1985), Tax Reform Act (1986), TAMRA (1988), OBRA (1990), and OBRA (1993). In addition, in 1992 the chairmen of the House Committee on Ways and Means and Senate Committee on Finance urged the Treasury to deal with the unsatisfactory problems associated with the regulations administratively. Treasury responded, but only on a temporary basis. The OBRA 1993 moratorium expired December 31, 1994, for calendar year taxpayers. Therefore, the 1977 regulations must now be applied for future years unless a regulatory or legislative solution is adopted.

As indicated above, Treas. Reg. 1.861-8(e)(3) works at cross purposes with the research credit. Although Treas. Reg. 1.861-8(e)(3) deals with the ability of companies to use the foreign tax credit to offset a portion of their U.S. income tax, the real economic effect of the regulations is to disallow any deduction for research and development expenses after a company is in an excess foreign tax credit position.

In 1983, CMA testified at length on this issue before the House Ways and Means Subcommittee on Oversight. (Hearings, Subcommittee on Oversight, House Committee on Ways and Means, 98th Congress, First Session, October 26; November 3, 1983). At that time we stated that the operation of the regulations would undermine the effectiveness of the research credit and would significantly increase the cost of that research in the United States. Moreover, we indicated that this increased cost of conducting research in the United States would be an important factor that would be considered in choosing whether to locate new research facilities here or abroad. We continue to believe that the regulations are ill-advised.

On at least seven occasions, Congress has wisely enacted and renewed the moratorium on apportionment of research and development expenses under the regulations. Unquestionably, a principal reason for doing so was the concern that the operation of the regulations was to encourage multinational businesses to shift research activities abroad. (See "Description of Proposals Relating to Research and Development Incentive Act of 1987 (S.58) and Allocation of R & D Expenses to U.S. and Foreign Income (S.716)," Joint Committee on Taxation, JCS-6-87, April 2, 1987.)

In 1989, National Science Foundation data suggested that U.S.-based corporations were increasingly conducting research outside the United States. R & D spending abroad by U.S.-based companies increased significantly more than comparable spending in the United States. Although the falling dollar accounted for some of this increase, R & D spending rose much faster abroad even after adjusting for depreciation of the dollar. The latest available National Science Foundation data demonstrate this trend is continuing. Based on 1992 data, a 1994 National Science Foundation study found that total company financed R & D performed outside the U.S. was $10.0 billion, equivalent to 10.3 percent of total company R & D spending. This represents an increase from the equivalent 8.5 percent share in 1987 and 7.7 percent share in 1982. ("Selected Data on Research and Development In Industry: 1992," National Science Foundation, 1994.)

One reason for this trend is that the effects of the excess foreign tax credit limitation on research are far more widespread than previously assumed. It is estimated that, as a result of the corporate tax rate reductions in the 1986 Act, almost 70 percent of all corporations have an excess foreign tax credit limitations problem. As recognized by the staff of the Joint Committee on Taxation in 1987:

> "On the other hand, the rate reduction potentially modifies the conclusions reached in the Treasury study. The percentage of worldwide income of U.S. corporations earned by firms in an excess foreign tax credit position is expected to rise as a by-product of the rate reduction, with the result that any change in the R & D allocation rules can now be expected to have a more uniform effect, from firm to firm, than was true in 1983. Consequently, the rate reduction tends to make any future revision of the R & D allocation rules a relatively more efficient mechanism for influencing taxpayers' R & D decisions. This is because the mechanism works only on taxpayers with excess credits, and it works better to the extent that it causes a greater proportion of taxpayers to face similar incentives for undertaking R & D in the United States."
>
> JCS-6-87, p. 42.

CMA believes that it is time to end the 18 years of controversy. The most rational solution is for Congress to enact a permanent allocation rule similar to the most recent moratorium.

We should also point out that the allocation required under Treas. Reg. 1.861-8(e)(3) is also required to be used to compute the allowable export incentive under the Foreign Sales Corporation ("FSC"). The FSC provisions were enacted to enable U.S. exporters to be more competitive in world markets. When the regulations are applied in this context, allocating research and development expenses to export income has the effect of reducing the FSC export incentive. CMA urges that any solution on the allocation of research and development expenses should also apply to the FSC provisions.

As CMA has emphasized, continued and expanded research and development in the United States is vital to our nation's economic future. Domestic tax policies that increase the cost of research in the United States while other nations continue to offer strong incentives to conduct research in their countries will provide continued motivation to reduce U.S. research activities, or to locate the research activities of U.S. firms outside the United States.

As a nation, America needs a strong private sector research establishment located in the United States. Through research we gain new technologies which are the source of continued economic growth and productivity, and provide the basis for new jobs and rising living standards.

STATEMENT OF JOE COBB

JOHN M. OLIN SENIOR FELLOW IN POLITICAL ECONOMY, THE HERITAGE FOUNDATION

We appreciate very much the opportunity to include a statement in the hearing record on the way in which our government treats both the taxation of private research and experimentation, and the Clinton Administration's apparent preference for a "Big Government" approach.

We can all agree that the United States, as the leading economic power in the world, is challenged continually on the frontiers of new technologies to stay in the lead. But there are two very distinct philosophies about how to make the needed progress.

Some people advocate government leadership, government planning, and government investment. We say that is wrong. Progress and innovation do not come from direct government aid, but from the efforts of inventors and scientists and engineers in the private sector. Even government funded laboratories and universities make the discoveries they do at the computer terminals and laboratory facilities where the scientific personnel themselves have wide freedom of action, independently of the program planners in their administrative offices.

To remain the world's leader in science and technology, the United States must put more emphasis on letting the private sector take the lead and *reduce emphasis on government programs* as the main strategy. The Clinton administration has clearly taken a stand in favor of government action.

THE DISAPPEARING R&E TAX CREDIT

The research and experimentation (R&E) tax credit expires on June 30, 1995. Last year the Clinton Administration did not support its extension. This year, their "support" is tucked away in a little note in the tax section of their budget, and it is not even mentioned in the Research and Development discussion.

It is clear that the R&E tax credit is quite peripheral to the Administration's science and technology policy goals. In our opinion, by contrast, that is where the main emphasis ought to be placed.

Instead of exploring new and sound ways to promote private industry research and development (R&D) or even private-public partnerships, the Clinton Administration has chosen to increase federal funding of government chosen research. As the following table shows, the Administration's record shows federal civilian R&D spending will have grown 15.1 percent by 1996, although defense-related R&D spending has fallen 9.9 percent.

CLINTON ADMINISTRATION R&D SPENDING

[Dollars in millions]

	1993	1995 (est)	1996 (prop.)	1993-96	1995-96
NASA	$8,885	$9,561	$9,179	3.3%	−4.0%
Commerce Dept.	607	904	1,096	80.6%	21.2%
EPA	519	552	616	18.7%	11.6%
ATP	68	431	491	622.1%	13.9%
TRP	472	443	500	5.9%	12.9%
Mfg. Extension Prog.	18	91	147	716.7%	61.5%
HHS	9,666	11,272	11,793	22.0%	4.6%
Total Civilian	30,329	33,815	34,902	15.1%	3.2%
Total Defense	42,164	38,898	37,981	−9.9%	−2.4%
Total All	72,493	72,713	72,883	0.5%	0.2%

Source: *FY1 996 Budget of the U.S. Government,* pp. 94-95; and *Analytical Perspectives,* p. 119.

More noticeably, a series of programs of widely questioned effectiveness have grown dramatically. From Fiscal Year 1993 through Fiscal Year 1996:

- the Advanced Technology Program (ATP) would grow to $491 million, or 622 percent
- the Technology Reinvestment Program (TRP) would grow to $500 million, or 5.9 percent
- Commerce Department R&D would grow to $1.1 billion, or 80.6 percent
- the Manufacturing Extension Partnership would grow to $147 million, or 717 percent
- HHS Department R&D would grow to $11.8 billion or 22 percent.

THE UNWELCOME NEW SYSTEM OF GOVERNMENT TECH CENTERS

The Manufacturing Extension Partnership (MEP) program is a prime example of the Clinton Administration's bold new government-dominated initiatives. But at the same time, it is a good example of why this approach needs to be questioned.

Started in 1988 as part of the Omnibus Trade and Competitiveness Act, the MEP was supposed to bridge the gap between sources of manufacturing technology and the small and mid-sized companies that were viewed as facing barriers that make

them relatively slow in adopting important new technologies. The National Institutes of Standards and Technology (NIST) is in charge of the initiative.

The NIST program has been criticized as unworkable and unresponsive to industry needs. In a 1991 report, the General Accounting Office indicated that "overall, the . . . programs have been only somewhat effective in addressing the technology needs of small manufacturers . . . while legislation establishing the . . . program emphasized the transfer of advanced technologies being developed at federal laboratories, the centers have found their clients primarily needed proven technologies."

Mandate for Change, the political issues handbook published by the Progressive Policy Institute (PPI) in January, 1993, which in those days was called "President Clinton's think tank," criticized the MEP tech centers as:

> their performance has been disappointing. Like other government retail service efforts, the extension services have reached too few firms and most manufacturers regard them as unlikely sources of practical expertise. [p. 75]

The book advocated instead a new kind of privately run "teaching factory," which [emphasis supplied]:

> would overcome many of these extension services shortcomings by operating as an *industry-owned and -operated* learning center. It would offer groups of firms within a particular industry a place to put new processes into operation and experiment with new technical applications. Its relevance to real factory floor problems would be reinforced by a *requirement that firms provide at least half the operating costs of the facility. [ibid.]*

Private industry-led alternatives to the government extension centers exist—from networks of consultants to full-scale integrated teaching factories. These alternatives address the concern raised by the Progressive Policy Institute's study, yet the Clinton Administration has increased MEP funding to $147 million, which is 717 percent.

VANISHED? A COLLABORATIVE PRIVATE SECTOR R&E CREDIT

More important, however, is that the Clinton Administration's budget completely ignores two initiatives to foster what are truly industry-led partnerships—a modification to the existing R&E tax credit introduced in the previous Congress by Senators Danforth and Baucus (S. 666) and Senator Lieberman (S. 394) to reward collaborative R&D. Incentives for collaborative R&D have wide support, including the Democratic Leadership Council, the NorthEast-MidWest Coalition, the National Academy of Engineering and others.

These proposals would modify the R&E tax credit in a fiscally responsible way. By providing a greater reward in the form of a flat credit for R&D conducted in teams from different organizations, the modification would maximize limited private and public sector R&D and encourage firms to allocate scarce R&D resources to projects that benefit both their individual goals and joint, industry-wide goals.

The proposed extension of the R&D tax credit would also stimulate new research—research unlikely to be undertaken individually whenever it might be too risky or too long-term, or so generally applicable that no single developer could fully capture all the benefits competitively. By making more efficient use of both private and publicly funded R&D resources, the proposed collaborative credit could significantly advance the overall efficiency and effectiveness of the R&E tax credit.

Today one of the most touted reasons for government initiative R&D financing is that a central agency has some advantage in selecting among different proposals submitted by individual organizations and companies. Therefore, and perhaps most importantly, a collaborative R&E tax credit would allow private industry to initiate joint research and experimentation projects. *Private*-public partnerships would be encouraged to flourish without the obtrusive hand of the federal government directing the area of study.

The cost of stimulating industry-led partnerships would be significantly lower through a collaborative R&E tax credit than through direct federal subsidies. The Danforth-Baucus and Lieberman modification in the R&E tax credit was estimated to cost about one-quarter the amount of the existing R&E tax credit. This would be roughly one-half of the cost of the ATP program a program that has been criticized as one "unblemished with success."

The Congress needs to adopt policies that promote private industry-led R&D rather than government-led R&D. Congress should protect incentives for the more efficient, collaborative form of R&D employed to a greater degree by our trading partners. And Congress should ensure that industry puts its money where its self-interest is, that the private sector co-funds the research. This would most effectively assure and that the research is relevant to the practical needs of America's manufacturing industries. A collaborative R&E tax credit provision, like the proposals intro-

duced in the previous Congress by Senators Danforth and Baucus (S. 666) and Senator Lieberman (S. 394) should be given serious consideration by this Committee.

STATEMENT OF MICHAEL S. DELELLO, ELECTRIC POWER RESEARCH INSTITUTE
AND
DAVID O. WEBB, GAS RESEARCH INSTITUTE

Mr. Chairman and members of the Subcommittee, the Electric Power Research Institute (EPRI) and the Gas Research Institute (GRI) appreciate the opportunity to respond to your request for information relating to the nature of collaborative research and the potential benefits of a specific collaborative R&D tax credit to incent this highly leveraged and efficient approach to research and development. As difficult funding decisions are being made regarding the nature and level of federal support for technology research and development, we believe it is imperative to examine appropriate ways to encourage the private sector to fund more of these activities. Consequently, private sector R&D structures should be examined both for their capability to absorb the scale of research that the federal government may no longer support and the open nature of their operations in order to assure the broadest public benefit.

Combined with federal funding challenges that face our nation's energy technology development infrastructure, transition to a deregulated environment by the gas and most recently the electric utility industry has brought about a foreseeable strain on the private investment in R&D. Together these factors naturally impact a company's investment in longer term R&D in light of short-term cost realignment and result in an unintentional "double-hit" to our Nation's energy R&D infrastructure. Therefore, consideration should be given to the modification of the existing law to provide for an optional 20% flat credit for research that is done in a collaborative environment performed for the public's benefit by 501(c)3 not-for-profit scientific and educational organizations as an important complement to extending the R&E credit. This would serve as an important incentive for the private sector to maintain its desired commitment to collaborative research during this time of deregulation. It would also incent the nature and level of research that could fill the gap for potential reductions in federal R&D programs.

ABOUT EPRI AND GRI

EPRI and GRI manage R&D on behalf of their members and have operated as 501(c)3 organizations for the past 20 years. This status requires us to operate in a manner that allows non-discriminatory access to our research results.

Jointly, our organizations manage more than $700 million dollars in R&D annually. Membership in our organizations is voluntary and technology priorities are set by the market-place in concert with public interest. Both EPRI and GRI conduct research that is vital to assuring the optimal and economical use of electricity and natural gas with an emphasis on safety, health, and the environment. Due to the unique nature of our organizations, we are able to conduct highly-leveraged non-duplicative research that could not be carried out by individual companies or indeed, otherwise.

EPRI was founded in 1972 by leaders of the electric utility' industry. Due to rolling-blackouts in the northeastern United States, Congress envisioned a mandatory fee from utilities to sponsor a federally conducted research program. The utility industry responded by requesting that they establish a private consortia to conduct the research in order to assure its R&D relevance to the industry and its customers. Hence, EPRI was founded and has met these criteria ever since.

Membership includes approximately 700 electric utility members ranging from investor-owned, to public, and rural electric cooperatives representing approximately 70% of our nation's electricity sales. EPRI's research covers the breadth of technologies relating to the generation, transmission and distribution, and end-use of electricity. EPRI has a core program that conducts high-risk, cutting edge science and technology development that provides the basis for new applied technologies in the years to come, as well as, an environmental and health program that distinguishes the possible risks associated with such issues as electromagnetic fields, climate change and air, land and water quality. EPRI investor-owned member dues are approved by state public utility commissions which assures public benefit.

GRI was founded in 1976 by a committee of members of the boards of directors of the American Gas Association and the Interstate Natural Gas Association of America. Consequently, GRI is the research, development and demonstration management organization of the natural gas industry. Its mission is to discover, develop

and deploy technologies and information that measurably benefit gas customers and enhance the value of gas energy service. GRI accomplishes its mission by planning and managing a consumer sensitive, cooperative research program of approximately $300 million emphasizing technology transfer. GRI conducts its R&D program in cooperation with its 326 member companies and other participants, which provide funding as well as input for the programs content and direction.

GRI is funded by a surcharge collected by its interstate pipeline member companies through tariffs approved by the Federal Energy Regulatory Commission (FERC) for natural gas transportation services. Regulatory bodies in 50 states and the District of Columbia are automatic intervenors in the FERC review of GRI's programs.

VALUE OF A COLLABORATIVE R&E TAX CREDIT

The goal of an R&E credit was not just to promote R&E but to promote technological innovations that will have a practical positive impact on the American public's standard of living. In contemplating changes to the credit, the committee should seek to reward firms which leverage their limited R&D dollars through collaboration. This presents an excellent opportunity to think about the best ways to structure the credit to achieve its ultimate goals.

Again, exigencies of the federal budget process suggest that the credit be modified to reward private R&D activities that may need to absorb this research and disseminate the results to the broadest public base possible. The structure of collaborative 501(c)3 research meets both the scale and public benefits tests of this potential transfer of responsibility. By coordinating joint R&D, consortia leverage limited R&D resources. They serve as a speedy and efficient technology deployment mechanism by maintaining a network of its partners, both developers and users of technology. Consortia advance the starting line for competition between our manufacturers by reducing the costs of technology and the time to absorb that technology.

Such a modification could fiscally improve the execution of the credit. By stimulating industry-led collaborative efforts, the modification credit will maximize limited private R&D funds, and encourage firms to better allocate scarce research resources to projects which advance both their individual and collective goals. The modification will also stimulate new research—research unlikely to be undertaken individually because it is too costly, too risky or too long-term. Finally, by making efficient use of private R&D resources, the modification will fully and cost-effectively advance the aim and policy rationale behind the existing credit.

CONCLUSION

A framework can be constructed through the tax code to encourage research partnerships that are industry-led in the most efficient manner possible. In today's world, maintaining the latest technology is not just a question of market share, it is a question of strategic economic significance to the Nation. In technology-intensive industries, failure to maintain a strategic and innovative edge could impact an entire industries competitive future.

The subcommittee's re-examination of the current credit creates an opportunity to recognize the benefits and efficiencies of collaborative R&D. As the credit leverages research dollars it encourages more efficient use of limited R&D resources, As the credit spreads risks and costs, it encourages new research that would not be conducted in its absence. As the credit eliminates duplicative research that would otherwise be conducted, it reduces the tax expenditure. These criteria are consistent with the intent of the current credit.

The Goodyear Tire & Rubber Company

Akron, Ohio 44316 - 0001

STANLEY C. GAULT
CHAIRMAN OF THE BOARD
CHIEF EXECUTIVE OFFICER

April 13, 1995

The Honorable Orrin G. Hatch
Chairman, Subcommittee on Taxation and
Internal Revenue Oversight
Senate Finance Committee
Washington, DC 20510

Dear Mr. Chairman:

The Goodyear Tire & Rubber Company (Goodyear) respectfully submits this statement for the written record of the Subcommittee on Taxation and Internal Revenue Service Oversight hearings relating to the research and experimental credit held on April 3, 1995. The statement specifically focuses on the allocation of research and experimental (R&E) expenditures under section 864(f) of the Internal Revenue Code of 1986 (Code).

Goodyear is a one of the world's leading manufacturers of tires and rubber products, and the leader in the United States, operating 32 plants in the United States and 41 plants in 25 other countries. Goodyear also operates two rubber plantations and more than 1,200 retail tire and service outlets in the U.S. and approximately 400 other distribution facilities around the globe. Goodyear employs over 45,000 people in offices and plants in all fifty states.

Goodyear entered the 1980's as the market leader in the world tire industry. Competition in the United States was extremely intense, as Firestone, BF Goodrich, General Tire, and Uniroyal all battled Goodyear for market share. However, Goodyear entered the 1990's as the only remaining major American-owned multinational tire manufacturer.

All major competitors are now foreign-based companies: Bridgestone, Michelin, Pirelli, Sumitomo, and Continental. Continental, a German company, acquired General Tire in 1987. Bridgestone, a leading Japanese tire manufacturer, acquired Firestone in 1988. Michelin, a French company and a leading European manufacturer, acquired the Uniroyal-Goodrich joint venture in 1990. Pirelli acquired Armstrong for its technology, Sumitomo acquired Dunlop, and Yokohama of Japan purchased Mohawk.

Goodyear remains independent of foreign ownership and successfully competes in the international arena largely because of its commitment to research and development in pursuit of technological advantage in the design and manufacture of tires.

Goodyear's technological excellence and innovation is well proven throughout the company's 97-year history. Highlights of Goodyear's innovations include:

1910 to 1919	Carbon black for improved wear, test equipment, and pneumatic truck tires.
1920's	New tread compounds for significantly improved mileage.
1930's	The first pneumatic tractor and earthmover tires -- plus rayon-reinforced, all-synthetic, studded and Lifeguard tires.
1940's	The first nylon-reinforced and wire-reinforced tires and oil-extended synthetic rubber with improved quality.
1950's	3T tempered cord for tubeless tire construction and first polyester-reinforced tire.
1960's	The first steel radial accepted by all U.S. automakers, the first steel truck tire and the first wide-tread tire.
1970's	The first all-season tire.
1980's	The Eagle family of high-performance tires developed from Goodyear's racing tire leadership.
1990's	The Aquatred family of tires which incorporate the "aquachannel" design for improved traction and handling on wet roads and the Invicta GFE which gives a 4% fuel efficiency improvement.

This ability to develop and market exciting new products, materials and processes made Goodyear an early industry leader. In 1952, Goodyear became the first in the industry to reach $1 billion in sales, in 1974 -- the first to reach the $5 billion level, and, in 1988 -- the first to reach the $10 billion level. These inherent strengths must serve as the basis for us to meet the challenges of the 1990's and the next century.

The influence of changing tire technology can be exemplified by an overview of how the radial tire, introduced in Europe by Michelin in 1948, changed the course of the tire industry.

Radial type construction (versus bias-ply construction) significantly changed the tire characteristics such as ride, noise level, life and traction. European auto manufacturers engineered suspension systems to match the characteristics associated with the radial tire. This began the evolution of improvements in handling, control and ride which was created by the union of radial tire and suspension system design. Although no U.S. auto manufacturer was using the radial tire as standard equipment, Goodyear recognized the significance of the changes and made a decision to go to Europe and research radial construction technology.

Goodyear had to go to Europe in order to develop radial tire technology because radial tires require a unique auto suspension system design which was not used in U.S. automobile manufacturing at that time. In 1957, a research staff was established as part of the existing Goodyear Luxembourg was selected due to its proximity to the European auto manufacturing base and for the convenience of an existing tire facility. This decision was critical. Goodyear

moved in this direction before the other U.S.-based tire manufacturers, and before the radial tire was used by the U.S. auto companies. This calculated risk turned out to be a key element in Goodyear's U.S. market leadership position.

The Luxembourg research effort marked Goodyear's entry into radial technology which now dominates the tire market worldwide. Except for bias-ply temporary spare tires, all passenger tires sold in the U.S. to auto manufacturers since 1982 have been radials. Currently, nearly all passenger tires sold in the U.S. replacement market were radials.

GOODYEAR'S RESEARCH AND EXPERIMENTATION

Goodyear's research function is based in Akron, Ohio with additional tire development technical centers in Luxembourg and Japan. These three facilities operate as one global research group developing a common data based of technology. The Japan Technical Center is part of the worldwide effort to expand U.S. tire exports.

The Japan Technical Center has enabled Goodyear to be at the cutting edge of Japanese tire and automotive suspension technology. This, in turn, has allowed Goodyear to develop supplier relationships with six original equipment manufacturers in Japan as well as eight Asian transplants in North America. Consequently, during 1995, Goodyear will export more than one million automotive tire units to Japan as well as supply more than five million units to the Asian transplants in North America. Without the direct technical cooperation with these Japanese original equipment manufacturers in Japan, neither of these supplier relationships could have been developed and consequently the business would have gone to one of Goodyear's foreign competitors.

During 1994, Goodyear's R&E expenditures approximated $340 million worldwide. All worldwide R&E expenditures are paid for and recorded as expenses of the parent company Goodyear. All technology, know-how, and patents resulting from the R&E are owned and controlled by the parent company Goodyear as a matter of corporate policy to safeguard proprietary control of these important assets. Any use of this know-how or technology outside the U.S. is arranged under a license arrangement with a foreign company, generally a controlled foreign corporation.

The Luxembourg and Japan research facilities operate as cost centers under contractual obligation to perform R&E activities for the parent company Goodyear. Costs incurred are reimbursed by the parent company Goodyear without mark-up. Accordingly, the costs incurred in Luxembourg and Japan do not provide a tax deduction in the foreign country since the expense is offset dollar-for-dollar under the reimbursement arrangement. Goodyear includes the entire worldwide R&E expenditure as expense in the U.S. tax return. During 1994, parent company Goodyear reimbursed the Luxembourg Technical Center approximately $125 million and the Japan Technical Center approximately $15 million.

STATUTORY ALLOCATION OF RESEARCH

Section 864(f), the statutory research allocation rule, expired for calendar year taxpayers as of December 31, 1994. Fiscal year taxpayers whose tax year ends after December 31, 1995 and before August 1, 1995 continue to apportion R&E under section 864(f) through their current years.

If section 864(f) is extended beyond its December 31, 1994 expiration date, Goodyear would be adversely affected by Code section 864(f)(1)(B)(ii)'s requirement that 50 percent of foreign-

performed research must be allocated directly to foreign source income. This rule is the reciprocal to section 864(f)(1)(B)(i) which provides that 50 percent of the research conducted in the U.S. must be directly allocated to U.S. source income. Both of these rules are intended to be a strong incentive to U.S. firms to conduct research in the U.S. to the extent possible, Goodyear conducts the majority of its research in the U.S. However, Goodyear cannot take full advantage of the incentive, because a large portion of its radial tire research must be performed in certain foreign locations, where Goodyear's customers are located. Simply stated, if Goodyear is to remain among the leading tire manufacturers in the world, it must conduct research where the radial tire and related automotive design and manufacturing technology is located. Goodyear's foreign research is not "moveable".

Ironically, if Goodyear could productively conduct all radial tire research in the U.S., it would pay less U.S. tax. This is because 50 percent of all of its research would then be allocated to U.S. source income. Three is no foreign tax benefit to Goodyear resulting from conducting research in Europe or Japan. Neither Goodyear nor its Luxembourg subsidiary derives a U.S. foreign tax benefit through this arrangement, as compared to U.S. and foreign taxes which would be due if the research activity now performed in Luxembourg were instead conducted in the U.S.

Goodyear believes that the special allocation rules contained in Code section 864(f) are intended to be an incentive to conduct research in the U.S. Goodyear also believes that Congress did not intend to place U.S. companies in an internationally uncompetitive position through the application of these rules. Goodyear is severely penalized by the requirement to allocate 50 percent of its foreign research to foreign source income, the effect of which is to deny Goodyear part of its credit for foreign taxes it pays. This results in partial double taxation of foreign source income. Goodyear's foreign competitors do not suffer from similar treatment in their home countries. Goodyear's foreign competitors thus gain a direct competitive advantage over Goodyear.

This unfair competitive advantage to foreign companies would be significantly reduced if the Code were amended to mitigate this double taxation effect. Therefore, Goodyear proposes that the rules of Code section 864(f) be extended with an amendment to allow U.S. taxpayers an election to allocate on the basis of gross sales or gross income (under Code section 864(f)(1)(C)) some or all of that portion of their foreign-incurred R&E expenses which would otherwise be directly allocated to foreign source income under Code section 864(f)(1)(B)(ii), the 50 percent direct foreign allocation. However, under this election, the amount of foreign incurred R&E expenses which is elected would have to be matched by an election to allocate, on the basis of gross income or gross sales, an equal amount of domestically incurred R&E expense, which would otherwise be directly allocated to U.S. source income under Code section 864(f)(1)(B)(i).

This proposal would relieve Goodyear from the competitive penalty effectively imposed on its foreign R&E operations, while requiring the company to waive an equal amount of the domestic incentive. Thus, Goodyear would be better able to compete with its foreign competitors, but would not be allowed as great an incentive as a U.S. company that is able to conduct all of its R&E in the U.S.

Thank you for the opportunity to submit these views for the record of the Subcommittee's hearings.

Most sincerely,

WRITTEN STATEMENT OF

HARRY L. GUTMAN
KING & SPALDING

On behalf of the Generic Pharmaceutical Industry Association, the National Association of Pharmaceutical Manufacturers, and the National Pharmaceutical Alliance

HEARING BEFORE THE

Subcommittee on Taxation and IRS Oversight
Committee on Finance
U.S. Senate
on the
Research and Experimentation Tax Credit

April 3, 1995

I am pleased to submit this written statement on behalf of the Generic Pharmaceutical Industry Association, the National Association of Pharmaceutical Manufacturers, and the National Pharmaceutical Alliance (the "Organizations"). The Organizations support the permanent extension of the research and experimentation tax credit (the "R&E credit") and urge that in connection therewith the Congress reiterate its previously expressed intent that the expenses incurred in the process of developing generic drugs have been, and will continue to be, eligible for the R&E credit.

This reiteration of Congressional intent is necessary at this time because, as described in more detail below, the Internal Revenue Service ("IRS") has taken the position in a number of audits of generic drug companies, and in a technical advice memorandum, that developers of generic drugs are per se ineligible to claim the R&E credit for their premarketing development costs and costs to secure Food and Drug Administration ("FDA") marketing approval of their products as new drugs. Moreover, the Treasury Department, despite having testified on October 6, 1994 before the House Ways and Means Subcommittee on Select Revenue Measures that generic drug manufacturers should be subject to a "facts and circumstances" determination process to determine eligibility for the R&E credit, has refused to exercise its policy prerogative and intervene with the IRS regarding its interpretation of the scope of the credit. As a result of the stalemate that has been created by the Treasury's deliberate failure to follow through on its Congressional testimony, the Organizations are compelled to seek Congressional clarification as an alternative to costly litigation.

The balance of this statement first describes the issue in more detail. It then describes the process of developing and securing regulatory approval for a generic drug. Third, the statement discusses current law governing the allowance of the R&E credit, as well as the Congressional intent in enacting that legislation, and demonstrates that the process of creating a generic drug falls squarely within the ambit of expenses that Congress intended to qualify for the R&E credit. Finally, the statement describes the alternatives now available to the Congress.

THE ISSUE

The IRS has taken the position that developers of generic drugs are per se ineligible to claim the R&E credit for their premarketing development costs and costs to secure Food and Drug Administration marketing approval of their products as new drugs.

Technical Advice Memorandum 9346006 (the "TAM") holds that Internal Revenue Code Section 41(d)(4)(C)[1/], which excludes from the credit expenses related to the reproduction of an existing business component from a physical examination of the business component itself or from plans, blueprints, details, specifications, or publicly available information, applies to these expenses. In rationalizing this conclusion, the TAM states,

> We believe the statutes and legislative histories ... are evidence that a generic drug is a duplication of another taxpayer's business component and the development of the generic drug is excluded from the definition of the term "qualified research" under Section 41(d)(4)(C) of the Code. TAM, p.9.

The TAM also states,

> It is our view that Congress considers generic drugs for approval under the ANDA procedure to be duplications of existing listed drugs. Drugs approved under the ANDA cannot improve on the target listed drug. TAM, p.10.

The conclusion stated in the TAM is unwarranted under the statute, factually incorrect and contrary to Congressional intent. First, as discussed more fully below, a generic drug is not developed from a physical examination of a target drug or from publicly available information. Thus, the process of development of a generic drug is not described by the literal language of the exclusion. Second, generic drugs may improve on the target listed drug in terms of shelf life and stability, to say nothing of cost. Third, the legislative history of Section 41(d)(4)(C) makes clear that "reproduction" means reverse engineering of an existing product, not development of an alternative by original research and experimentation. Again, as described in more detail below, the process of developing a generic drug product does not in any sense constitute "reverse engineering." Furthermore, FDA views generic drugs as new drug products.

In a number of meetings, the taxpayer to whom the TAM was directed attempted to persuade the IRS that its position was incorrect. When it appeared the IRS would not change its position, the taxpayer, together with the Organizations, brought the issue to the attention of several members of Congress. This effort culminated in a legislative proposal during the last Congress to clarify the application of the R&E credit to expenses incurred in developing generic drugs. Under the proposal, a generic drug would not be treated <u>per se</u> as a duplication of an existing business component. That is, Section 41(d)(4)(C) would be clarified to the effect that mere "duplication" of <u>performance</u> by the development of alternative products to achieve similar results would not preclude the credit, so long as all the other conditions of Section 41 were satisfied. Therefore, taxpayers would be permitted to show, on a facts and circumstances basis, that the expenses incurred in conducting "research and experimentation" to produce the drug would qualify under Section 41.

The proposal was the subject of a hearing on October 6, 1994 before the Select Revenue Measures Subcommittee of the House Ways and Means Committee. At that hearing, Glen Kohl, the Tax Legislative Counsel, took the position on behalf of the Treasury that

> the costs of developing a product that is new for a particular taxpayer can qualify for the credit even though other taxpayers already offer similar products. The only

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1/ Section references are to the Internal Revenue Code unless otherwise noted.

> express limitation that applies to competing products is the exclusion for products developed by duplication . . . . The question of whether the development of generic drugs is qualified research or nonqualified duplication should be resolved on a case-by-case basis, using the same standards that apply to other products in taking into account all of the relevant facts and circumstances of each case. Hearing Record, p.9.

Congressman Payne asked Mr. Kohl "[I]s it the position of the Treasury that a generic drug is simply a duplication of a brand name drug?" Mr. Kohl responded, "[w]e think that for a generic drug you have to look at the facts and circumstances . . . . The Treasury Department is . . . saying . . . that the rules the Congress has enacted in the past should apply to the facts involved in developing a generic drug." Hearing Record, p.13. Later, Mr. Kohl noted that if the duplication issue were resolved favorably the credit would be available for the expenses of developing the generic drug. Id.

Treasury's description of the scope of the R&E credit is precisely what the industry has previously argued to the IRS. That position is completely consistent with the legislative history of the R&E credit.

Subsequent to the hearing, representatives of the taxpayer and the Organizations met with Mr. Kohl and Paul Kugler, Assistant Chief Counsel of the IRS in charge of Passthrough and Special Industries, in an attempt to resolve the inconsistency between the Treasury's statements and the holding of the TAM. In that meeting the scope of the duplication exclusion was discussed further. The question posed was whether, assuming all other conditions of the R&E credit were satisfied, the mere fact that a taxpayer's product achieved similar or the same performance or results as another's would by itself preclude the R&E credit under the duplication exception. (For example, would a synthetic diamond developed by qualifying research and experimentation be disqualified from the R&E credit?) Mr. Kohl stated that in his view it would not. In contrast, Mr. Kugler appeared to be of the view, with respect to generic drugs having an active ingredient which is composed of the same molecule as the brand product, that "bioequivalence" of drug performance as required by FDA law is fatal to the R&E credit under the duplication exception. Treasury and the IRS were asked to reconcile their apparent conflict, perhaps in the context of a revenue ruling project. Mr. Kohl indicated that the appropriate course of action was to pursue the matter further with the IRS.

On March 7, 1995, following Mr. Kohl's suggestion, representatives of the taxpayer and the Organizations met with Marlene Gross, Acting Deputy Chief Counsel of the IRS, Mr. Kugler and members of their staffs to discuss the matter further. At that meeting it was made clear that in the IRS view any generic drug product that (i) uses the same molecule of active ingredient as the corresponding brand product, and (ii) achieves the same therapeutic result as a brand name product is excluded from credit benefits by Section 41(d)(4)(C). It was clear that Ms. Gross, who is in a position to overturn that IRS position, has no intention of so doing.

Virtually all of the generic industry products meet these two conditions. Moreover, despite contrary Treasury views, the IRS has made it clear that it will not change its position. It is thus highly likely that this position will be taken by IRS auditing agents against all companies manufacturing generic products to preclude the tax credit for such products. Therefore, the only avenues to resolution of this issue are litigation on the individual companies' tax deficiencies or legislation. Litigation is expensive and an unnecessary and unfair use of both taxpayer and Government resources in light of the statute, Congressional intent and Treasury's expressed views. Congressional reiteration of its original intent would eliminate the problem.

DEVELOPING AND SECURING REGULATORY APPROVAL FOR A GENERIC DRUG

A generic drug product is a new drug that can achieve the same therapeutic results as a brand name drug product and that can be substituted in prescriptions for the brand name product. What is new are the formula of inactive ingredients and the manufacturing and delivery process, and the research and experimentation of a generic drug manufacturer focuses on that.

A generic drug is developed by original research that delivers a known active ingredient using a newly developed and unique combination and ratio of inactive ingredients with the active ingredient. While a generic product usually uses the active ingredient having the same molecular structure as the brand product, even in such cases the other physical characteristics of the generic's active ingredient, such as the polymorphic form, impurities, and particle size, affect the bioavailability of the final drug. Such effects must be compensated for by variations (i.e., differences) in the inactive formula and/or manufacturing process of the generic product (from those of the brand), so that the generic product is "bioequivalent" to the brand to within a tolerance allowed by the FDA. Such compensation (and other factors) usually result in the generic product having a different formula of inactive ingredients and a different manufacturing process from the brand.

The identity, type, nature, characteristics and sources of each inactive ingredient must be intensively researched and evaluated because each ingredient must serve a specific purpose in the final formulation. Variations in combinations and identity of inactive ingredients with the active ingredient affect performance, as measured by bioavailability. The quantity and ratio of the inactive ingredients must be developed in combination with the active ingredient in the generic manufacturer's own formulation to achieve a successful generic drug product. Every aspect of the formulation of any drug product requires a delicate balance to achieve the desired result. Moreover, in addition to its own formulation, the generic drug manufacturer creates a new manufacturing process. Exhibit A describes the process in more detail.

A generic drug is, by definition, a new drug under the Food, Drug and Cosmetic Act (the "FDC Act"). 21 U.S.C. § 321(p)(1) (1988). It is a violation of the FDC Act to market a new drug in interstate commerce unless the FDA has approved a new drug application for the drug. 21 U.S.C. §§ 355(a), 331(d).

A generic drug may be approved through one of two types of new drug applications. The only difference between FDA approval standards for the two types of new drug applications, (1) full new drug applications ("NDA") and (2) abbreviated new drug applications ("ANDA"), is that ANDAs require bioequivalence data rather than clinical studies. Compare 21 U.S.C. § 355(b)(1)(A)-(F) with 21 U.S.C. § 355(j)(2)(A)(i)-(vi). Although an ANDA need not contain information on safety and effectiveness investigations, it is required to contain data demonstrating bioequivalence to a "listed" drug, i.e., a drug previously approved in a full NDA. If a generic drug company's initial tests do not demonstrate bioequivalence, the company must alter its formulation and/or manufacturing process and retest. The cycle of testing and revising the formulation is followed until (1) the tests indicate that the two products are bioequivalent within a range of plus or minus 10% to 20% with respect to the rate and extent of absorption or (2) the company fails to achieve its objective abandons its effort.

An ANDA must contain the same types of information concerning components, composition, manufacturing methods, samples, and labeling, as a NDA. 21 U.S.C. § 355(j)(2)(A)(i)-(vi) (1988).

Because the FDA considers each new drug as a unique product, an ANDA is not required to compare its qualitative and quantitative formulation and manufacturing process with that of the listed drug's manufacturer. See 21 U.S.C. § 355(j)(3) (1988). Each new drug's performance depends on product-specific variables, including chemistry, manufacturing, and control factors that are specific to the manufacturer and its product.

For each new product it attempts to develop, a generic drug manufacturer goes through a process of experimentation to discover chemical properties of its source of the active ingredient, the dosage form technologies, combinations of inactive ingredients with the active ingredient, enclosures, and the equipment and manufacturing techniques that will produce a product that satisfies the ANDA performance test.

CURRENT LAW AND CONGRESSIONAL INTENT

Section 41(a), originally enacted as Section 44F in 1981, allows a tax credit for incremental "qualified research" expenses. Section 41(d)(4)(C), enacted in 1986, excludes from the definition of qualified research "any research related to the reproduction of an existing business component (in whole or in part) from a physical examination of the business component itself or from plans, blueprints, detailed specifications, or publicly available information with respect to such business component." The Treasury has yet to issue Regulations interpreting Section 41(d)(4)(C).

In many cases the IRS has conceded that, but for Section 41(d)(4)(C), the expenses of developing a generic drug would constitute qualified research expenses. However, it takes the position that Congress intended generic drugs submitted for approval under the ANDA procedure to be "duplicative" of existing drugs and therefore ineligible for the credit under Section 41(4)(C).

A generic drug is not a "duplicate" of an existing drug. The FDA has supplied a statement explaining the FDA's requirements for approving a generic drug and the agency's interpretation of the status of generic drugs under the FDC Act. The statement, which was supplied by Roger L. Williams, M.D., Director, Office of Generic Drugs, Center for Drug Evaluation and Research, is attached as Exhibit B. In it, Dr. Williams states, "Because a generic drug's performance depends on product specific variables, the FDA considers each generic drug as a distinct product. ... A generic drug is, therefore, not the same drug as the one approved in the NDA." Exhibit B, p. 2 (emphasis supplied).

Second, the activities listed in Section 41(d)(1)(4) are Congress' express illustrations of situations in which the credit will not be allowed because the research is not research in the experimental sense. A generic drug company's research activities are clearly experimental.

Thus, the scope of the exclusion of research related to reproduction of an existing business component from an examination is the critical question. Although the heading of Section 41(d)(4)(C) is "Duplication of Existing Business Component," as noted above the exclusion is for "research related to the reproduction of an existing business component (in whole or in part) from a physical examination of the business component itself or from plans, blueprints, detailed specifications, or publicly available information with respect to such business component." Because a generic drug company conducts its own original research to produce its own new business components, and does not copy existing products by cloning or reverse engineering, its research activities are eligible for the Section 41 credit under current law.

The legislative history on this issue specifically states, "The exclusion for duplication does not apply merely because the taxpayer examines a competitor's product in developing a different component through a process of otherwise qualified experimentation requiring the testing of viable alternatives and based on the knowledge gained from such tests." H. Rep. No. 841, 99th Cong., 2nd Sess. (1986), at II-75 (report of the Conference Committee on the Tax Reform Act of 1986, Pub. L. No. 99-514) [hereinafter "1986 Conference Report"]. The clear implication is that a taxpayer who examines a competitor's product that achieves a particular result and then, through experimentation, develops its own original product that duplicates the result achieved by the competitor's product, is entitled to the Section 41 credit. The original formulation and manufacturing process developed in connection with a generic drug are clearly new and different business components under the statute.

As explained in the 1986 Conference Report, duplication means producing something that exactly corresponds in composition and structure to an original. The House Ways and Means Committee Report explanation of the Section 41 changes in P.L. 99-514 (H.R. Rep. No. 426, 99th Cong., 1st Sess. (1985)) defines duplication as "The reproduction of an existing business item of another person from a physical examination of the item itself or from plans, blueprints, detailed specifications, or publicly available information with respect to such item." Such duplication is referred to as "reverse engineering" in the 1986 Conference Report at II-75, restating the language from the Ways and Means Committee report cited above. A generic drug invention is not a duplicate or a reproduction, but is a new and different product; the new product duplicates results, but the product itself is not a duplicate or a reproduction.

The conclusion that generic drug research should be entitled to the credit is reinforced by the numerous references to drug products in the legislative histories of Section 41 and Section 174. In particular, the legislative history of Section 41 is crystal clear: "[C]osts of experiments undertaken by chemists or physicians in developing and testing a new drug are eligible for the credit because the researchers are engaged in scientific experimentation."

Moreover, it is also clear from various amendments to the FDC Act and from legislative history that Congress intended to encourage the development of generic drug products. For example, in 1984, Congress estimated that the availability of generic equivalents to brand name drug products approved after 1962 would save American consumers $920 million over 12 years. H.R. Rep. No. 857, 98th Cong., 2d Sess., pt. 1, at 17 (1984). Older Americans, in particular, would benefit, since they use almost 25% of all prescription drugs. Id. In addition, the federal government would save millions of dollars from the increased availability of generic drug products, since it purchases drugs through the Medicaid program and in veterans' and military hospitals. Id. at 17, 19. State governments would also save on drugs purchased through Medicaid. Id.

The availability of high quality, low cost alternatives to brand name drug products is desirable from both an economic and a public health standpoint. A generic drug product is usually sold for a significantly lower price than a brand name product. As mentioned above, the lower level of costs of research for generic drug developers compared to the development of a brand name drug results in lower credit compared to the major pharmaceutical houses, but it does not mean that the credit is not a major incentive for research.

The research required to develop a generic drug product consists of experiments related to the physical content, form and production process of the new drug, and, once a model has been

developed, studies that compare the model's bioavailability with the bioavailability of the target brand name product. These studies are necessary in order to obtain FDA approval to market the generic drug product. 21 U.S.C. § 355(j)(2)(A)(iv) (1988). This process is less expensive, however, than the process would be if it also included the clinical studies necessary to show that a drug product is both safe and effective for the purpose for which it will be marketed. H.R. Rep. No. 857, 98th Cong., 2d Sess., pt. 1, at 19.

The potential for lower cost prescription drug products was one of the major factors that Congress discussed in connection with 1962 amendments to the Food, Drug, and Cosmetic Act. Drug Amendment of 1962, Pub. L. No. 87-781. The FDA established a procedure for submitting abbreviated new drug applications (ANDAs) for new generic versions of brand name products initially approved before enactment of the 1962 Amendment. See 21 C.F.R. 314.56 (removed by 57 Fed. Reg. 17950, 17963 (April 28, 1992)). In a further effort to expand the use of lower cost generic drug products and increase competition within the pharmaceutical industry, Congress enacted the Drug Price Competition and Patent Term Restoration Act of 1984. Pub. L. No. 98-417. This Act amended the Food, Drug, and Cosmetic Act by adding an ANDA procedure for generic equivalents to any FDA-approved drug product for which a valid patent was not in force. 21 U.S.C. § 355(j).

Congress clearly intended to encourage the development of generic drug products by enacting special FDA procedures. Excluding the costs of such development from eligibility for research-related tax benefits would flatly contradict that intent. Allowing research credits for brand name drug product development while denying such credits for generic drug product development would decrease the competitiveness of generic drug products, discourage the development of generic products, and increase the costs of generic products. Congress certainly did not intend the application of the R&E credit to produce such results.

CONCLUSION

It is frustrating to have to submit a statement to the Subcommittee and suggest that clarifying legislation is necessary because the Treasury will not exercise its tax policy authority and direct the IRS to interpret the statute in accordance both with its views as expressed before a Congressional Committee and with Congressional intent. The generic drug industry believes the result it seeks would ultimately be achieved through costly, time consuming litigation. Clearly these costs can be totally avoided if the IRS were to change its position. If it does not, clarifying legislation will be needed to resolve the issue.

EXHIBIT A

DEVELOPMENT OF GENERIC DRUGS

The development of a generic drug product is a very complex and intricate undertaking which requires a great deal of time, effort and research by skilled professionals. The company knows that a trade-name product can achieve certain therapeutic results, but must research and experiment to create its own product that will achieve those results. The products ultimately created are entirely new products created through a process of experimentation and research

Although the products created by generic drug manufacturers achieve the same results as trade-name drug products that have been patented, the generic drug products are entirely new. The patents do not contain information that would permit a generic drug manufacturer to duplicate patented drug products even if the generic drug manufacturer wished to do so. Such patents reveal only the active ingredients and do not reveal any of the many other variables discussed below. Moreover, patent file information generally does not reflect the product that actually goes to market. As a result, it can be misleading, and reviewing such information could result in confusion. Consequently, the staff of many companies do not even read patents.

The Goals. The goal of generic drug manufacturers is to design a particular dosage form (using a known active ingredient in a specific strength) which meets the same Food and Drug Administration ("FDA") standards of quality and efficacy as an already approved drug product (trade-name product)

For solid oral (and suspension liquid) products, the standard used is a demonstration that the generic drug product is bioequivalent to the trade-name product. This means the generic product must not differ significantly from the trade-name product in bioavailability, i.e., the rate and extent to which active drug ingredients with a given physiological effect are physically absorbed. Bioequivalence is demonstrated by comparing measured parameters from a controlled human bioavailability study and/or by comparing analytical test results such as dissolution profiles.

Bioavailability does not have to be demonstrated for injectable solutions. However, the FDA requirements and scrutiny of the formulation, purity and processing of generic injectable products are even more stringent than the bioequivalence standards for solids and suspension products. Generic firms must meet all FDA standards when developing generic products of acceptable quality.

The knowledge and experience of skilled research personnel are the keys to the development of a quality bioequivalent generic drug product. Any number of factors can affect the final safety, quality or performance of a generic product and each of the factors must be considered and addressed in the initial development of the generic product. The following summary describes in detail the many variables that must be researched to create new products that will produce known therapeutic results.

Evaluating and Selecting the Active Ingredient. The active ingredient is one of the primary factors which needs to be researched and evaluated even before a formula is developed. While the strength of the active ingredient has been established by the trade-name product, the nature of the active ingredient used for a generic product must be considered at the outset. Trade-name drug companies often synthesize their own active ingredients, but generic drug companies generally purchase active ingredients from outside sources. The particle size of the raw material may also substantially affect the absorption of the drug in the body. Consideration must also be given to the different available crystalline or polymorphic forms of the active

ingredient because the form may also have a great effect on the absorption and bioavailability of the drug and on the solubility of the drug in a final injectable solution.

Most bioavailability studies that fail do so because the generic formulation does not achieve the same maximum concentration of a drug in the blood at a certain time as the trade-name drug. A great deal of research is required to attain comparable concentration for two products in a bioavailability study. Lack of research into the characteristics of the active ingredient could very well be a substantial contributing factor in these study failures.

Developing the Formulation of the Drug Product. Once a suitable active ingredient has been selected, the company must formulate the generic drug product. The exact combination and ratio of inactive ingredients (excipients) with the active drug is very critical to the final manufacture, stability and bioavailability of a drug product. Just as with the active ingredient, the identity, type, nature, characteristics and sources of each inactive ingredient must be intensively researched and evaluated because each ingredient must serve a specific purpose in the final formulation. In addition, the quantity and ratio of the inactive ingredients must be developed exactly because the formulation of any drug product is a delicate balance of materials which is not easily achieved. For example, 1% of a specific inactive pharmaceutical material in a formulation can act as a lubricant to aid in manufacturing a product, but 3% of the same material can destroy the dissolution performance of the same product. The quantity of each ingredient must be painstakingly researched and evaluated to achieve the optimum balance in order to obtain the physical and chemical characteristics needed for the generic product.

A solid oral generic product must differ from the approved trade-name product in appearance (size, shape, coating, color, and so on). Changing the color, coating, size, shape, or other aspect of a product in any way can change the rate at which, and the extent to which, the active ingredients are released and absorbed (too high bioavailability) or it can decrease these functions (too low bioavailability). Consequently, changing trade-dress variables requires experimentation to determine what combination of new variables will produce the target biovailability.

Selecting Techniques for Manafacturing Dosage Form. The development work is not complete after the research of the initial formulation. The manufacturing procedure by which a product dosage form is made must be determined. Here, issues such as the type of machinery to be used, the mixing times needed, the use of milling or screening steps and the amount of compression force used come into play. Just as different sources or types of ingredients affect a formulation, different types of blenders or length of mixing times can substantially affect the final product. The dissolution and bioavailability of a product can be affected significantly by different types or rates of mixing, as well as by varying compression forces. For example, if there is too much compression force, the tablet will not dissolve, but if there is not enough compression force, the tablet will not hold together.

The use (of lack of) milling/screening steps in a manufacturing procedure is also a factor which must be considered because the particle size of the active and inactive ingredients in the final dosage form can be affected by these steps. As noted above, particle size of the active ingredients can be a very significant factor affecting the bioavailability of many drug products.

The effect of manufacturing conditions on a product's bioavailability must be considered in the context of developing a practical manufacturing procedure which can be used repeatedly on a large scale after the generic product receives FDA approval. Additionally, a balance must be developed for each manufacturing

factor for each individual formulation. The processing of injectable products requires significant effort and evaluation to establish accurate "in process" limits and validate the process. The FDA requires that the process of manufacturing injectable products and each system be validated before approval. The information required is quite extensive and must address not only the consistency and quality of the process and product but must also validate the sterility of the product and the sterilization process. The research and experimentation necessary to obtain this information is required for each new generic injectable product prior to approval.

Thus, extensive research and experimentation by experienced research personnel is required for each and every type of formulation in order to properly develop a reasonable manufacturing procedure for each successful generic drug product.

Developing Methods of Testing and Conducting Tests.

The analytical laboratory contributes substantially to the development of each product. Early in the process, the analytical laboratory must work closely on the development of the formulation, identifying any potential drug-excipient interactions and assessing the effect of each type and form of ingredient on the stability and analytical performance of the formulation. Experiments and assay procedures must be developed for use in such evaluations. Approval standards for a generic drug product require that the assay method be specific to the particular formulation developed. Such methods require research and development by the generic firm. The FDA requires extensive validation of these methods to demonstrate that the method is specific, reproducible and consistent with the particular formulations. Extensive research and testing using a characteristic number of batches of both the trade-name product and the developed generic product is required in order to satisfactorily show that the methods developed demonstrate the bioequivalence of the two drug products.

To obtain FDA approval to market an oral solid generic drug product, the company must demonstrate to the FDA that its product is bioequivalent to a trade-name product. To demonstrate this bioequivalence, the company conducts comparative bioavailability studies through an outside testing laboratory. It provides the testing laboratory with samples of its own proposed formulation and with purchased sample of the trade-name product. The laboratory administers these products to a group of subjects: one half of the group receives the trade-name product and one half receives the company's formulation. The laboratory then tests for bioavailability, for example by drawing blood samples at certain intervals. At a later time, the test is performed again on the same subjects: those who originally received the trade-name product are given the company's formulation, and vice versa. Bioavailability tests are conducted again, and the results are compared statistically between the company's product and the trade-name product.

Summary. Generic drug manufacturers perform extensive research and development to create new drug products. Of course, as in almost all research, the manufacturer has specific objectives or goals. The goal is to create new products that achieve the therapeutic results of trade-name drug products already on the market. The guidelines for the approval of a generic drug product require extensive demonstration that such a product is bioequivalent to the target trade-name product. This demonstration includes (a) accumulating extensive data necessary to demonstrate the purity of injectable products and to validate the manufacturing process or (b) demonstrating the bioavailability of solid oral products and suspensions.

The requirements for demonstrating that the bioavailability of a generic product matches the bioavailability of a trade-name product are very narrow and specific. In other words, very little

deviation is allowed. These stringent standards are made even more narrow by the inherent variability of the human body. Therefore, the development of a generic drug product involves research into and consideration of a combination of factors which affect the final bioavailability of the drug product.

This synopsis briefly summarizes the issues a generic research and development team must address and resolve through extensive experimentation and research in order to create a successful generic drug product. Research and experimentation is necessary for selection of variables, including active and inactive ingredients, the manufacturing equipment and procedures, and the analytical methodology to be used. Each variable must be carefully developed and evaluated to achieve the optimum effect on the physical and analytical performance, quality and stability of the generic drug product. Each combination of variables creates a potential for variation in the performance of the final product. The fact that there are a number of trade-name products off patent for which generic counterparts are not available demonstrates the difficulty in selecting and combining variables. Despite their research and experimentation, generic firms have not been able to develop the exact combination of variables to create successful generic substitutes for such products.

EXHIBIT B

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
Rockville MD 20857

NOV 25 1992

Mr. Thomas Scarlett
Hyman, Phelps & McNamara, P.C.
700 Thirteenth Street, N.W.
Suite 1200
Washington, DC 20005

Dear Mr. Scarlett:

Based upon your letter of November 17, 1992, we understand that the Internal Revenue Service has raised certain issues concerning the "creditability" of the costs associated with the development of generic drugs. The following statement explains the Food and Drug Administration's ("FDA's") requirements for approving a generic drug and the agency's interpretation of the status of generic drugs under the Federal Food, Drug, and Cosmetic Act ("FDC Act"). The statement is not intended to address the relationship between the FDA's process for reviewing and approving generic drugs and the IRS's tax issues.

Broadly speaking, there are two types of approval applications for prescription drugs. A "full" new drug application ("NDA"), contains safety, clinical effectiveness, and bioavailability data, as well as information about the chemistry of the proposed product, its method of formulation, and the manufacturing procedures that will be used to make it. An "abbreviated" NDA ("ANDA") omits the safety and clinical effectiveness data, but contains "bioequivalence" data to show that the drug is present in the blood at the same level as a drug approved in an NDA. An ANDA also contains the same types of chemistry, formulation, and manufacturing information as a full NDA.

A drug approved in an ANDA is commonly called a generic drug. It contains the identical active ingredient as the NDA drug to which it is compared in the bioequivalence test(s). It must also have the same dosage form, the same dosage strength, the same route of administration, and the same labeling. The most important point of similarity is that the generic drug must be shown to be bioequivalent to the NDA drug. How a generic drug company achieves that objective varies within a range of options determined by the chemical properties of the active ingredient, the available dosage form technologies, the methods for combining the active ingredient with inactive ingredients to yield the desired drug release characteristics, and the equipment and manufacturing procedures to be used to process the ingredients and make the finished dosage form.

Because a generic drug's performance depends on product-specific variables, the FDA considers each generic drug as a distinct product. No drug may be marketed unless it is shown to be safe and effective for its intended use. An NDA drug is shown to be safe and effective by pre-clinical and clinical data and also by data relating to the chemistry, manufacturing, and control factors mentioned above. The evidence for the safety and effectiveness of a generic drug consists of a showing of bioequivalence to the NDA drug and by data about the chemistry, manufacturing, and control factors that are specific to the generic manufacturer and to its particular formulation of the drug.

A generic drug is, therefore, not the same drug as the one approved in the NDA. The ANDA applicant may use any appropriate technology to design and manufacture the finished dosage form so it is bioequivalent to the comparison drug, including different inactive ingredients and manufacturing procedures, different types of dosage form materials, different dosage forms (if the FDA grants permission), and different methods of producing the active ingredient (e.g., synthesizing it as opposed to deriving it from a natural source). Because these differences may affect the performance of the generic drug product, the FDA requires the ANDA to contain, in addition to a showing of bioequivalence, evidence that the manufacturer has correctly formulated, and characterized the active and inactive ingredient and that it has the manufacturing procedures, and the knowledge of how to use them, to make the generic drug product so that it performs acceptably when used in patients. Not only must the generic product deliver the active ingredient "bioequivalently" to the comparison product, but it must also be an acceptable drug product in its own right based on the FDA's approval criteria for product-specific performance characteristics.

In developing a generic drug product, a manufacturer does not have access to the NDA or ANDA submissions of other companies that have obtained FDA approval to market a product containing a particular active ingredient (unless the owner of a submission has legally authorized such access). Moreover, although some data from NDA and ANDA submissions are available under the Freedom of Information Act, specific information about the chemistry and formulation of a product and about manufacturing methods are considered proprietary. For this reason, a generic drug manufacturer must generate its own technical information in order to develop a finished product to be used in bioequivalence tests. Therefore, although the goal is to make a generic drug product that is as close as possible to the NDA product in its performance in delivering the active ingredient, the generic product is "new" in the sense that it is the result of the generic-manufacturer's knowledge and skill in devising its own original specifications and procedures for the purpose of making a product that will behave the same as the comparison drug product. Any similarity in methodology would be the result of chance operating on a finite number of possibilities, rather than replicating the NDA owner's work.

In fact, FDA considers every generic prescription drug product to be a "new drug" as that term is used in the FDC Act. The FDC Act used the word "new" to refer to any drug product that is not generally recognized as safe and effective. (See sections 201(p) and 505 of the FDC Act.) This means that, as a legal matter, each generic drug product must be approved in its own "new drug application", even though it has the same active ingredient and is otherwise similar to a product that has already been approved. The reason for this legal requirement is actually scientific, i.e., no two prescription drug products can be assumed to be the same only on similarities in the active ingredient, dosage form, and strength. Rather they are different products that must be shown to reach the same performance objective. A generic drug product is, therefore, "new" in the FDC Act sense. It is also different from the comparison drug product in that its similarity in the delivery of the active ingredient is the result of product-specific and manufacturer-specific decisions by the generic drug company. In other words, each approved generic drug product is unique.

If further information on the points explained above would be useful, please let me know.

Sincerely,

Roger L. Williams

Roger L. Williams, M.D.
Director
Office of Generic Drugs
Center for Drug Evaluation and Research

MASSACHUSETTS HIGH TECHNOLOGY COUNCIL

Dedicated To Growth ... Committed To Action

Testimony of:
Howard P. Foley, President
Massachusetts High Technology Council, Inc.

Submitted to the United States Senate Finance Committee's Subcommittee on Taxation and Internal Revenue Service Oversight

in *Support* of S. 351 making the current Research and Development tax incentive Permanent

Public Hearing Date: April 3, 1995

The Massachusetts High Technology Council urges the Senate to support S.351 sponsored by U.S. Senator Orrin Hatch (R-Utah) to make the current "job-generating" incremental research and development tax incentive permanent. This incentive, first adopted in 1981, is scheduled to expire on June 30, 1995.

Research and development is the basic ingredient of productive innovation and production improvements which increase efficiency, reduce costs and improve one's quality of life. A permanent, federal research and development tax incentive will have a significant and long-term impact on economic growth in the United States, creating needed jobs, increasing competitiveness and generating revenue.

There is no serious dispute among economists or policy makers about the fact that an environment that stimulates and facilitates the process of innovation is essential to continued growth. There is, however, some misunderstanding of just how important innovation is in comparison to increased investment in plant and equipment.

Investments in R&D and in capital equipment are the principal mechanisms by which new technology is created and deployed. The high cost of capital in the United States as compared to that of other countries, has the effect of retarding these investments and thus retarding relative productivity growth. In fact, for the past two decades, the U.S. has had the lowest rate of capital investment of any major industrial nation. By the same token, the trend of growth in investments in commercial R&D in the U.S. has seriously lagged the growth in Japan and in Germany.

The importance of innovation to productivity and economic growth is obvious. Our high technology companies and our universities have been leaders in innovation and have helped the United States reap significant benefits from that leadership position. However, the ability of our high tech economy–heavily dependent on R&D–to grow and compete is being challenged by other countries. Increasingly, calls for a permanent extension of the R&D tax incentive have been heard from "both sides of the aisle" in recent years.

In urging President Clinton in support of a permanent R&D tax incentive, Massachusetts Governor William F. Weld (R) said "Massachusetts has benefited greatly since we enacted the country's most generous tax incentive for research and development. We've already seen companies either move here or expand in Massachusetts to take advantage of the tax credit."

Former U.S. Senator Paul Tsongas (D-Massachusetts) said providing for a permanent research and development tax incentive "should be self-explanatory." "We can't compete long-term if we are not putting our earnings back into research and development. Such reinvestment into a company should be viewed as the corporate investment of highest priority and taxed accordingly."

U.S. Representative Joseph P. Kennedy II (D-Massachusetts) urged Congress to permanently restore the R&D tax incentive, saying "the R&D tax credit has provided a valuable economic incentive for U.S. high tech companies to increase investment in R&D in order to enhance their competitiveness in the world marketplace. The growth and prosperity of our economy here in New England and across the nation depends on the kind of investment-friendly climate that the credit provides."

In Massachusetts, after five years of hard work by members of the Mass. High Tech Council, a *permanent* state-level incremental research and development tax incentive was passed into law in 1991. This law creates an important tax incentive for incremental increases in R&D investments in Massachusetts. For many Massachusetts employers and researchers on our university campuses, this incentive is a visible change in Massachusetts tax policy which demonstrates the Commonwealth's commitment to re-establishing an investment-stimulating, job-creating, pro-research climate.

The purpose of the Massachusetts R&D tax incentive is straight-forward: it is designed to influence future decisions on where and how much R&D is conducted. It was modeled on the federal R&D language in effect at the time (August 1991), and has a number of distinct advantages over similar R&D incentives in other states. One key distinction is that it is permanent, providing investors with the crucial decision-making factors of *certainty* and *stability*.

Simply put, Massachusetts now has the most attractive state-level R&D tax incentive in the United States. This very tangible tax policy decision has been a key component in the economic turnaround of the state and demonstrates that Massachusetts is serious about improving the ability of the private sector to increase investments in Massachusetts, while at the same time generating new state and local revenues without raising tax rates.

We believe a permanent federal incremental R&D tax incentive will stimulate additional research activity, thereby increasing jobs and revenue, both in the short run and in the long run when successful new products are brought to market. In this context, the question shouldn't be: How can we afford this incentive for increased research and development activity? Instead we should ask: What action might we take today to provide a long-term boost to our economy?

We urge the Senate Finance Committee's Subcommittee on Taxation and Internal Revenue Service Oversight to support S.351 making the current research and development tax incentive permanent.

About the Massachusetts High Technology Council:

The goal of the Massachusetts High Technology Council is to help make Massachusetts the world's most attractive place in which to live and work, and in which to create, operate and expand high technology businesses.

The Council is a non-profit, non-partisan corporation made up of 200 entrepreneurial and respected chief executive officers of Massachusetts high technology companies -- employing more than 300,000 people.

Because it holds no political affiliation, the Council is free to focus on any issue which affects the Massachusetts economy, and to take a firm leadership role in instituting change wherever it is needed.

Since the Council's founding in 1977, it has advocated for, and ultimately influenced, state policies which have helped improve the business climate for the Massachusetts high tech industry. Today, its advice and support is sought on a wide variety of issues by members of the state legislature, the Governor's office, the national media, the education community, and other organizations, both public and private, in Massachusetts and around the world.

STATEMENT OF THE NATIONAL FOREIGN TRADE COUNCIL, INC.

Mr. Chairman and Members of the Subcommittee: The National Foreign Trade Council, Inc. (NFTC) appreciates the opportunity to submit its written comments on the issue of the research and experimentation expense allocation rules contained in Treasury regulations Section 1.861-8(e)(3). While a more detailed discussion of our position is described below, the NFTC would respectfully urge the Treasury to resolve this issue permanently by regulation to provide for a 64 percent allocation to U.S. source income for R&D expenses conducted in the U.S., or, alternatively to provide at least for the 50 percent apportionment contained in the OBRA Legislation of 1993. If a regulatory solution cannot be achieved, then the NFTC would urge Congress to enact a permanent, legislative resolution of this issue by providing for allocation of at least 50 percent of R&D expenses incurred in the U.S. to U.S. source income.

The NFTC, organized in 1914, is an association of over 500 U.S. business enterprises engaged in all aspects of international trade and investment. The NFTC membership is actively engaged in a broad spectrum of industrial, commercial, financial, and service activities around the world. The NFTC's sole agenda is to foster an environment through tax and trade policy that permits U.S. companies to be dynamic and effective competitors in the international business arena. In this respect, the need to establish a permanent solution to the R&E allocation rules is a crucial element to further the ability of U.S. companies to be competitive in the growth markets of the international economy.

BACKGROUND

The history of the 861 R&E allocation issue is one of uncertainty, instability, and lack of finality. Since the issuance of the 1977 regulations that proposed a maximum allocation of 30 percent to U.S. source for R&D expenses conducted in the U.S., there have been numerous efforts of a temporary nature, both legislative and regulatory, to address the R&E allocation question.

To briefly summarize the history of the R&E allocation issue after issuance of the 1977 regulations, Congress imposed a moratorium on implementation of the 1977 regulations beginning in 1981 and extending through 1986. During that period, U.S. companies were permitted to allocate the entirety of their R&D expenses to U.S. source income. The rule permitting all expenses to be allocated to U.S. source was modified in 1987 to allow a 50 percent allocation to U.S. source income. For most of the next five years (1988-1992), Congress passed legislation that provided for a 64 percent allocation of R&E expense to U.S. source income.

In 1992, the Chairmen of the Tax-Writing Committees sent a letter to then Treasury Secretary Brady urging that the 64 percent allocation rule be extended by administrative fiat. The Treasury Department favorably responded to this request, but only for a temporary period of 18 months. The 1993 OBRA legislation modified the administrative fiat provided by the Treasury Department to allow a maximum of 50 percent of R&D expenses to be allocated to U.S. source income, but the 1993 legislation expired December 31, 1994. Unless an administrative or legislative solution is obtained, the 1977 regulations will apply for 1995 and all subsequent taxable years.

PROPOSED SOLUTION

The NFTC believes that the preferred solution to the R&E allocation issue is for the Treasury Department to revise the 1977 regulations to provide for a 64 percent allocation of R&E expense to U.S. source income, or, alternatively at least to adopt the 50 percent allocation rule contained in the 1993 OBRA legislation. If the R&E allocation issue cannot be satisfactorily resolved at the regulatory level, then the NFTC would urge that the Congress enact legislation to extend on a permanent basis the 50 percent allocation rule adopted in the 1993 legislation. The NFTC wishes to emphasize the need to provide a permanent solution, either regulatory or legislative, that is fair in its treatment of R&E expense allocation relative to foreign companies against which U.S. businesses must compete.

REASONS UNDERLYING THE NEED FOR A SOLUTION

There are numerous, compelling reasons for either the Treasury Department or the Congress to act expeditiously to establish rules that would allocate R&E expenses to U.S. source income in a reasonable manner. These include:

1. *R&E Expenses Allocated to Foreign Source Income Under U.S. Rules are Disallowed as a Deduction in Foreign Countries.* Any portion of the R&E expense incurred in the U.S. that is allocated to foreign source income is disallowed as a de-

duction in the foreign country. When this scenario occurs, the result is to impose double taxation on U.S. companies. Foreign companies against which U.S. businesses compete for market share are generally permitted to deduct all of the R&E expenses performed in their own country.

To avoid the double taxation that ensues when R&E expenses are allocated to foreign source income, U.S. companies may consider the possibility of conducting their R&E expense in foreign jurisdictions. While a decision to relocate is only undertaken after weighing all business-related factors, U.S. policy should encourage U.S. companies to perform R&E expense in the U.S. Instead, present U.S. policy causes U.S. companies to at least to consider the alternatives of performing R&E elsewhere.

2. *Allocation of R&E Expenses to Foreign Source Income Undermines the Purposes Underlying the Research and Development Tax Credit.* The research and development tax credit (R&D) was enacted by Congress to promote the performance of research and development in the United States. It is widely recognized that research and development in the United States has declined relative to the level of R&D performed in most industrialized countries. U.S. tax policy that encourages the performance of R&D expenses in this country works in concert with or is complementary to the R&D tax credit mechanism. Conversely, the objectives underlying the R&D tax credit are undermined to the extent that a significant portion of R&E allocation expense is allocated to foreign source income.

3. *Reasonable R&E Rules and an Effective R&D Tax Credit Enhance U.S. Competitiveness in a Global Economy.* Adoption of allocation rules that provide an allocation of up to 64 percent of R&E expenses to U.S. source income promotes the competitiveness of U.S. companies that are growth oriented and effectively compete in the global economy. The companies affected by both the R&E rules and the R&D tax credit compete against their foreign counterparts in the emerging market places of the world/i.e./China, Indonesia, etc. It can unequivocally be stated that strengthening these two components of U.S. tax policy (the R&D tax credit and R&E allocation rules) will enhance the competitiveness of U.S. companies and lead to greater job creation.

4. *The Solution to the R&E Allocation Problem should be Permanent in Nature.* As the chronology of the R&E allocation debate amply demonstrates, there is a compelling need to devise a permanent solution to the R&E allocation issue. While the NFTC preference would be for the Treasury to revise the 1977 regulations in a manner consistent with our recommendations, the important point to stress is the need for a permanent and not a temporary solution to what has been an intractable problem. It is extremely difficult for U.S. companies to plan their business investments in foreign jurisdictions when a vital component of the tax planning for investments of this nature, namely, the allocation of R&E expenses, is uncertain and unreliable. We urge the Treasury and the Congress to produce a permanent solution to this issue. The forgoing reflect our comments on the 861 R&E allocation issue. Please let us know if you need further information or if there is any other manner in which we may be of assistance.

National Society of
Professional Engineers

Statement
of the
National Society of Professional Engineers
on the
Research and Experimentation Tax Credit

April 14, 1995

The National Society of Professional Engineers supports legislation (S. 351/H.R. 803) to make permanent the tax credit for research and experimentation. The R&E tax credit is one of the most effective ways the government can encourage private sector research and development.

The National Society of Professional Engineers (NSPE) was founded in 1934 and represents over 65,000 engineers in over 500 local chapters and 52 state and territorial societies. NSPE is a broad-based disciplinary society representing all technical disciplines and all areas of engineering practice, including government, industry, education, private practice, and construction.

The R&E tax credit, provided in Section 41 of the Internal Revenue Code, allows taxpayers to claim an incremental credit for R&E expenditures. Because the credit applies only to R&D expenditures that exceed a base R&D investment amount, it encourages the beneficiaries to increase their level of R&D investment beyond what they would normally have conducted without the credit. The tax credit also counters one of the primary disincentives to private sector R&D - the financial disadvantage incurred by a firm that conducts research, only to have their competitor gain access to the new technology, without having incurred the research expense themselves. In a sense, the tax credit "reimburses" those industries whose research benefits the economy as a whole.

Also, because the R&E credit applies to contract research conducted on the taxpayer's behalf, as well as to in-house R&D, the credit may in some cases stimulate greater cooperation between industry and academia. Both industry and academia benefit when certain academic research is directed to specific industry needs.

Unfortunately, the R&E tax credit has been subjected to short-term extensions. As a result, beneficiaries have not been able to make long-range business plans with confidence. In fact, some eligible participants may have chosen not to avail themselves of the tax benefit as a result of the uncertainties involved. In effect, the short-term nature of the provision has diminished its potential to effectively meet our important research needs. We are confident that the impact of the R&E credit will be magnified when it is made a permanent component of the tax code.

The R&E tax credit is a sensible use of tax policy to enhance our nation's long-term economic competitiveness. It has our full support.

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Dear Mr. Chairman and Members of the Subcommittee on Taxation and IRS Oversight: The Northeast-Midwest Institute is pleased to submit testimony on a matter of great importance to our region and the nation — the need to extend and improve the research and experimentation tax credit now contained in Section 41 of the Internal Revenue Code.

The Northeast-Midwest Institute is a nonprofit research and public education organization dedicated to the long-term economic vitality of the Northeastern and Midwestern states. Founded in 1976, the Institute is a bipartisan organization that works on issues of regional importance to the 18 states of Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont and Wisconsin. The Institute works closely with the nearly 100-member Northeast-Midwest Congressional Coalition, co-chaired by Representatives Bob Franks (R-NJ) and Marty Meehan (D-MA), and the Northeast-Midwest Senate Coalition, co-chaired by Senators Jim Jeffords (R-VT) and Daniel Patrick Moynihan (D-NY), and has 36 Members.

Among other things, the Institute sponsors the Northeast-Midwest Leadership Council, a distinguished panel advising Members of Congress on issues affecting the region's future. Composed of corporate, academic, and labor leaders, the Council presents the private-sector viewpoint on how public policies should be shaped to create jobs and expand business.

Mr. Chairman: In my capacity as executive director of the Northeast-Midwest Institute, I believe the R&D tax credit must be made permanent. Our manufacturing region has long since crossed the line where technology rather than labor costs control our productivity and prosperity.

The Northeast-Midwest region depends heavily on manufacturing. With almost half of the 373,000 small and mid-sized manufacturing firms located in the region, manufactuing success is key to the region's economic vitality. This success in manufacturing depends upon improvements in products and process that can only come from research and development. Technology development is particularly critical for firms in the Northeast-Midwest because the region's higher costs of living force manufacturing firms to pay higher wages. These higher wage levels can only be sustained through high value-added manufacturing. The R&E tax credit proposed by the committee is one of the best vehicles to encouraging such important research and development.

In order to widen the benefits of a permanent R&E credit, government must be as creative as industry in providing a fertile environment for the growth of research. Other nations have developed and nurtured a technology development and deployment infrastructure that is based on collaboration, and we in the United States must begin to promote this environment.

Therefore, Mr. Chairman, I believe a permanent credit should provide incentives

for R&D innovation. I urge the Committee to extend the credit and to increase the incentive for collaborative R&D efforts, an area where our competitors are significantly ahead of the United States.

The benefits of a permanent, collaborative R&E credit include:

1. R&D Is Essential to Our National Competitiveness

Real economic growth always has been dependent on development and application of new science, innovation, and technology. Since the Great Depression, between 65 and 80 percent of all productivity improvements have been attributable to the use of new technology. Indeed, studies have shown that for every $1 dollar that individual businesses realize from their investment in R&D, society as a whole realizes $3 or more. High technology firms alone represent a significant importance to our nation. As indicated in the recent OSTP study, while high technology firms comprised only 0.7 percent of all U.S. firms (excluding sole proprietorships), their importance to the national economy far outstrips their numbers. They are the source of a disproportionately large share of employment, sales, and export growth. And they are the source of innovation from which flow much of the improvements in our nation's standard of living.

Not surprisingly, therefore, research plays a critical role in the competitive status of the U.S. It is a down payment on future economic vitality. Without adequate R&D, our businesses will eventually lose the race for discoveries and innovations that form the basis for new products, new services, new manufacturing processes, market share and ultimately, world influence.

Unfortunately, the U.S. share of R&D has fallen for the first time in 20 years, and more research is being conducted overseas by U.S. companies. Moreover, when our industries do make the necessary outlays, the commercialization of new technology and its assimilation into the manufacturing process are being accomplished more swiftly by our competitors. According to the National Science Board:

- *U.S. R&D stagnated in the late 1980s and continues to stagnate into the 1990s, showing a growth rate of only 0.4 percent, as foreign rivals increase their R&D investments.*

- *U.S. spends too few dollars on industrial R&D and makes poor use of the ones it does spend.*

- *Corporate laboratories are under severe financial stress and being forced to shift to shorter-term R&D.*

2. *More Collaborative R&D on Manufacturing Process and Other R&D Must be Encouraged*

There is little doubt that the current R&D credit stimulates product innovation and improvements to existing products. Accelerating advances in product design and manufacturing technology have re-shaped the manufacturing environment and the global marketplace for goods. Manufacturing firms are coping to adjust to a new environment where production runs are shorter, product cycles are quicker, and failure-free and timely production at decreasing costs is a condition for survival. The effects of these dramatic changes are intensified as an increasing number of smaller industrial firms enter the economic landscape with fewer workers with greater skill demands.

In this arena, process technology plays an increasingly prominent role. Access to and adoption of new technologies can outweigh transportation and labor considerations. Small and medium-sized manufacturers are particularly at risk due to limited technical and financial resources for acquiring and implementing off-the-shelf productivity tools.

Moreover, mere investment in new technologies may not be enough to address the challenge of international competition for domestic and international markets. U.S. companies also must benefit from instituting a continuous improvement process based on first upgrading their technologies and training. All companies must develop new expertise and integrate it with the traditional skills in order to modernize their factories with various advanced manufacturing techniques. Frequently, small companies that invest in new technology cannot afford the additional engineering talent required to organize their operations in ways that fully exploit the technologies they have adopted.

The ability to adapt to technological change is also an increasing requirement along the manufacturing food chain. Large companies, foreign and domestic, are becoming more concerned about their supplier's technological and organizational abilities. Manufacturers along the supply chain feel these competitive pressures manifested in the form of requirements for better quality, greater reliability, and more timely delivery. However, the small supplier usually cannot meet these demands without investing in new technologies. Without such investments they are operating far below their potential — their methodologies and management practices are inadequate to ensure that American manufacturing will be globally competitive.

3. *Collaborative R&D is Done To a Greater Extent in Foreign Nations*

The problem is exacerbated by the increasing tendency of foreign competitors to engage in collaborative R&D. Our foreign competitors have increased their investment in research, often acting in teams that leverage their investments. In the U.S. today, approximately 200 industry consortia have been established under the 1984 Act, and new groups are forming as companies band together to face stiff global competition.

However, this represents a small amount of the R&D pool. Little over 1 percent of all research is conducted cooperatively. Of the $150 billion in research and development conducted in the United States, only approximately $2 billion is conducted by consortia.[1]

By contrast, more than four times the relative percentage of R&D conducted cooperatively in Japan is collaborative, and about one-fifth of all joint research (or 6 percent of total R&D) is "horizontal" collaboration — collaboration among competing firms. Collaborative European projects include ESPRIT in information technology, RACE in advanced communications, BRITE in advanced materials and manufacturing, VLSIC for high capacity memory chips, ICOT for the fifth generation computer, and TRC for joint research on magnetic levitation and other technologies.

The U.S. must do more to promote cooperative research if we are to keep pace with our principal trading partners.

4. The Collaborative Credit Will Benefit Firms Not Encouraged by the Current Incremental Credit

The proposed enhancement to the R&E tax credit will promote cooperative research. The cooperative credit will assist companies that are otherwise increasing their R&E expenditures above the "base," regardless of how that base is defined in the section 41 incremental credit. Equally important, however, it also will benefit companies that cannot take immediate advantage of the incremental credit either because they do not have taxable income against which the credit can be offset, are subject to the limitations of the Alternative Minimum Tax, or whose R&D falls below the base. It also includes smaller firms that may be disinclined to invest the needed amounts in process or other technologies not perceived to inure to the bottom line immediately but need to make the investment to remain competitive in the long-run.

The ability to share in the results of cooperative research that is "incentivized" or encouraged by the enhanced credit is a direct benefit to all participants in a cooperative venture. In essence, the leveraged research is disseminated to small and large firms alike,

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[1] According to a recent survey Alliance for Collaborative Research, companies conduct research and development with consortia for four major reasons: (1) to reduce the cost of conducting research by spreading the cost, (2) to reduce the risk of conducting high-tech research in untried areas, (3) to reduce redundant research within an industry -- for example, innovations needed to meet an industry-wide standard or solve a broad problem, and (4) to conduct research which will only benefit the firm after a long period. Much of this research would not be conducted without the umbrella of the consortia because of the factors above -- risk, costs, and few short term benefits.

- 35% of consortia research reduces redundancies.
- 30% of consortia research spreads risks.
- 20% of consortia research spreads costs.
- 15% of consortia research will benefit only in the long term.

both profitable and currently unprofitable firms, and the indirect benefit of the credit is spread to the entire membership of the project. For firms that are below the "base," cooperation will allow them to "catch up to the fold" with immediately rewardable R&E expenditures.

The National Academy of Engineering also endorsed the idea of a collaborative R&D tax credit. Specifically, a recent Academy Study Commission, looking at various measures to increase the level of stability of R&D tax policy, recommended that the U.S.:

> *replace the current incremental Research and Experimentation tax credit with a permanent tax credit on the total annual R&D expenditure of a company to encourage an increase in the level and the stability of R&D activity across business cycles. In addition, extend the R&E tax credit to cover industry-sponsored R&D in universities, and other institutions, and the industrial contribution to R&D performed as a part of a consortium that includes government laboratories.*

As the committee is actively considering changes that would reward collaborative R&D — similar to the changes contained in S. 666 introduced last Congress by Senators Danforth and Baucus — I would like to focus my comments on the credit as it relates to collaborative R&D.

5. Collaboration Encourages New R&D, which is the Purpose of the R&E Tax Credit

Collaboration in areas of engineering research, for example, often concentrates on R&D that is not being performed by the private sector on an individual firm level. For example, much collaborative R&D focuses on unit manufacturing process R&D, which has been recognized by the National Research Council as grossly underfunded at a national level. While manufacturing process R&D can significantly improve the quality of products, lower costs, reduce scrap and improve the environmental integrity of manufacturing processes, it is difficult for any single manufacturer to capture the benefits of such research as opposed to the benefits of product-specific R&E. However, over the longer term such research has long range effects on our National industrial base and our National security.

Encouraging research that would not otherwise be conducted, as the Subcommittee knows, is the underlying justification of the R&E tax credit. Stimulating a change that would enhance and encourage collaboration would greatly advance the underlying policy goals of the current law, while incorporating sound science and engineering policy considerations.

6. Collaboration Also Reduces Duplication

Changes that would accelerate growth of collaborative enterprises is one of most important steps that can be taken to stimulate R&D in our tax code. Of course, when such a modification does not stimulate new R&D, it ensures R&D will be conducted through consortia for an altogether different reason. Much of the research being performed on process or environmental technology could be streamlined through

consortia, which typically provide a more efficient vehicle for R&D activity. This consideration is highly important during a period when, as the National Science Foundation points out, our private and public R&D resources are increasingly limited, and we have reduced the level of R&D as a function of GDP for the first time in more than 20 years.

7. Collaboration Assists in Technology Deployment

Finally, apart from reducing duplication of research or stimulating new R&D, consortia provide a fertile and robust environment for the deployment of technology, once developed. The consortia environment combines both suppliers and users of process R&D so the widest market for the implementation of such technology is assured.

Technology deployment is the means by which advanced manufacturing technologies, either equipment, software, processes or management techniques, find their way from development to the factory floor. Sustained, expeditious, and effective technology deployment is essential to help our manufacturing sector generate desperately needed economic development.

Beyond generalizations, the slow rate at which new technology is adopted in the U.S. is a demonstrable barrier to the deployment of new inventions and concepts into manufacturing industries. U.S. industry experts state that approximately 90 percent of new discoveries require 25 to 75 years to achieve widespread implementation in the U.S. The mean implementation time is approximately 55 years. By comparison, many of our trading partners bring new technology to fruition in much shorter time frames. This comparison is particularly salient when examining the Japanese, who claim a 400 percent faster adoption rate than the U.S. in R&D and automation.

The Committee must keep in mind that the final goal of the R&E tax credit is not merely to stimulate new R&D spending, but to commercialize or deploy technology that results from that spending.

Conclusion

When American technology and manufacturing ruled the world, we had no need to examine how technology was produced or how it was disseminated throughout our manufacturing base. We must now carefully examine the means by which this technology, instead of merely being developed in the U.S., is deployed and actually used by our small and medium-sized manufacturing base. We must look towards encouraging process R&D as opposed to simply product R&D. We must work together to fashion the right mechanism whereby technology can be developed and transferred in the most economically efficient manner. I believe a collaborative tax credit modification to existing law is a cost-effective means to achieve this objective.

The proposed modifications will improve the credit in a fiscally responsible way.

By stimulating industry-led collaborative efforts, the modification credit will maximize limited private and public sector R&D funds, and it will encourage firms to better allocate scarce research resources to projects that advance both their individual and collective goals. The modification will also stimulate new research — research unlikely to be undertaken individually because it is too costly, too risky, or too long-term. Finally, by making efficient use of public and private R&D resources, the modification will fully and cost-effectively advance the main policy rationale behind the existing credit.

In today's world, maintaining latest technology is not just a question of market share, it is a question of survival. In technology-intensive industries, failure to keep up with technological advances will have immediate repercussions, not only for the firms involved, but for the entire U.S. industry. Through the tax code we can construct the framework for research partnerships that are truly industry-led in the most efficient manner possible. I encourage the Committee to enact this important improvement to the R&E tax credit when it considers the credit in the coming weeks.

STATEMENT OF THE R&D CREDIT/SECTION 861 COALITION [1]

I. INTRODUCTION

This statement is being submitted by the R&D Credit/Section 861 Coalition (the coalition) in response to an invitation of the Senate Committee on Finance Subcommittee on Taxation and Internal Revenue Service Oversight welcoming written statements, with respect to its April 3, 1995 hearing regarding the research tax credit.

Mr. Marty Glick, the treasurer and a vice-president of Genentech, Inc. testified on behalf of the coalition at the hearing. Another witness who appeared before the subcommittee, Mr. Donald C. Alexander, addressed his comments to the issue of the allocation rules for U.S. research expense and the disincentive to American research caused by the outstanding regulatory rule on this matter. The coalition believes that this topic very much relates to the research credit, and we are pleased that Mr. Alexander raised this issue at the hearing.

We strongly believe the current regulatory rule, in fact, adversely affects U.S. research and the research credit; it discourages the very same U.S. research that the credit encourages. The coalition embraces Mr. Alexander's testimony, but wishes to add the following comments on this important issue.

II. RECOMMENDATION

The coalition recommends that a specific allocation of U.S. research expense to U.S. source income be provided on a permanent basis to at least the same extent as the most recent statutory and administrative rules (50%-64%). The treasury could provide such a regulatory rule. However, if such a regulatory solution cannot be achieved this year, then a statutory provision should be enacted to similar extent.

III. R&D CREDIT/SECTION 861 COALITION

The coalition is comprised of several prominent trade associations and their many members, including the American Electronics Association, the Biotechnology Industry Association, the Business Software Alliance, the Electronic Industries Association, the Information Technology Industry Council, the Pharmaceutical Research & Manufacturers Association, and the Software Publishers Association.

These trade associations represent several thousand companies, employing several million U.S. workers. The industries represented by the coalition are among the

[1] The R&D/861 Coalition is an ad hoc coalition of corporations and trade associations including the American Electronics Association, the Biotechnology Industry Organization, the Business Software Alliance, the Electronic Industries Association, the Information Technology Industry Council, the Pharmaceutical Research & Manufacturers Association, and the Software Publishers Association. For more information, contact William Sample, Lotus Development Corporation at (617) 693-1098.

most dynamic and fastest growing in the U.S. Our associations and their members are closely following Congressional consideration, and hopefully permanent resolution, of issues relating to both the research credit and the allocation of U.S. research expense.

IV. EVOLUTION OF THE RESEARCH EXPENSE ALLOCATION ISSUE

The issue of the appropriate allocation of U.S. research expense spans an 18-year period of continuing controversy, specifically on treasury regulation section 1.861-8(e)(3). Under this regulation, issued in 1977, U.S. research-intensive companies with foreign operations are required to treat a portion of their U.S. research expense as if the research was instead conducted offshore, for purposes of determining foreign tax credits. No foreign country allows a tax deduction for research conducted in the U.S., and consequently, these U.S. companies, effectively lose a deduction for the expenditures, and are exposed to international double taxation. The only way to ensure that such expenses become a direct deduction would be to perform the research in the foreign country, rather than the U.S. Movement of such research abroad is counterproductive to American economic interests. Accordingly, the Congress imposed a complete moratorium of the 1977 regulatory rule, from 1981 through 1986, under which 100% of U.S. research expense was allocated to U.S. source income.

This initial moratorium was subsequently modified in 1987 to mandate a 50% allocation to U.S. source income. Thereafter, from 1988 through 1992 (except for a short period during which the statutory override was allowed to lapse), Congress enacted several extensions of the moratorium, each providing a 64% rule.

In 1992, the Treasury Department was urged by the Chairs of the Finance and Ways and Means Committees to attempt to address this issue administratively. Treasury responded by providing a 64% allocation of U.S. research expense to U.S. source income, but only for a temporary 18-month period. Subsequently, the 1993 Omnibus Budget and Reconciliation Act enacted a rule (since expired on December 31, 1994 for calendar year taxpayers) that provided for a 50% U.S. research expense allocation to U.S. source income. Currently, with the OBRA rule expired, the 1977 regulation is applicable, unless further regulatory or legislative action is taken.

V. ADVERSE EFFECT ON U.S. RESEARCH AND THE RESEARCH CREDIT

As noted above, the 1977 regulatory rule regarding the allocation of U.S. research expense effectively denies a deduction for these expenditures, treating R&D as if performed abroad, for purposes of determining foreign tax credits. This constitutes an accounting fiction, and exposes such companies to international double taxation. A disincentive to U.S. research is consequently created. In effect, a penalty is directed at those American companies performing substantial U.S. R&D and successfully competing in global markets; both of these characteristics are highly beneficial to the U.S. economy and crucial to the growth of the high-tech companies in the Coalition.

The research expense allocation rule and the research tax credit are the two key elements of our tax policy relating to U.S. research. If the allocation of U.S. research expense is left to the outstanding IRS regulation, the goal of the research credit—increasing U.S. research activities—will at the same time be discouraged by the research expense allocation rule. These two halves of U.S. tax policy on research must not work at cross purposes, and should instead be complementary.

VI. PERMANENT SOLUTION

U.S. tax policy regarding research should be consistent, as discussed immediately above, and also predictable. As in the case of the research credit (where a permanent solution is needed for the credit to fulfill its intended legislative goal), a permanent solution to the issue of the allocation of U.S. research expense is also needed to, once and for all, remove this damaging penalty on U.S. research. Multiple, repetitive statutory (and administrative) allocation rules have been unable to successfully remove the disincentive, due to their on and off-again pattern. Growing U.S. research is critical to U.S. economic growth.

The Coalition believes that it is imperative that a permanent rule be provided regarding the allocation of U.S. research expense. By permanently returning to the initial Congressional moratorium on the 1977 regulation, the current disincentive would be totally eliminated. However, if this complete result cannot be achieved, an allocation rule at least to the extent of the most recently expired statutory and administrative rules (50%-64%)—should be provided, through legislation or administratively. The Treasury previously exercised its regulatory authority on this issue by an administrative rule for a limited 18-month period. We believe that regulatory

authority continues to exist by which this matter could be resolved. However, Treasury's written statement, from the April 3 hearing, notes that the statutory provision on this issue has expired, and then states that "the Administration supports a revenue—neutral extension of this provision." This might suggest that the Administration favors a legislative solution. In any event, the Coalition urges that a permanent solution, legislative or administrative, be implemented as soon as possible.

STATEMENT OF LESLIE B. SAMUELS
ASSISTANT SECRETARY (TAX POLICY) DEPARTMENT OF THE TREASURY

Mr. Chairman and Members of the Subcommittee:

I am pleased to present the views of the Administration on the extension of the research and experimentation tax credit (R&E credit).

Current law provides a tax credit equal to 20 percent of a taxpayer's increase in qualified research and experimentation expenses over a specified base amount. The base amount for the credit differs from company to company, but generally depends on the relationship that the company's past research expenses bears to its gross receipts for prior years. The R&E credit is scheduled to expire on June 30, 1995; taxpayers will not be able to claim the R&E credit for any expenditures made after that date.[1]

This Administration has consistently supported the R&E credit, and included a proposal for its permanent extension in the 1994 budget (the credit had previously expired on June 30, 1992). However, the Omnibus Budget Reconciliation Act of 1993 provided only for a temporary extension through June 30, 1995. As indicated in the Administration's budget for fiscal year 1996, we continue to support the revenue-neutral extension of the R&E credit.

The Administration recognizes the importance of technology to our national ability to compete in the global marketplace. Technology policy is a cornerstone of our economic and national security strategy. We are committed to working with the private sector to enhance the role that technology plays in promoting competitiveness, creating high-wage jobs, maintaining America's military superiority, improving our quality of life, and fostering sustainable development.

The R&E credit is one tool that could be useful in supporting and fostering American technology. The credit provides incentives for private-sector investment in research and innovation that can help increase America's economic competitiveness and enhance U.S. productivity. These incentives are particularly important because the U.S. economy is becoming increasingly reliant on technological know-how, and because private-sector investment in research often creates benefits for the economy that are not captured by an individual company.

The Administration continues to believe that for the R&E credit to be most effective, it should be made permanent, to provide taxpayers with certainty in making long-range business plans. It is also important that the cost of any extension of the R&E credit be fully offset. Increasing the Federal deficit could have an adverse impact on R&E expenditures (by drawing capital away from private-sector investments) and could thus offset the benefits resulting from the extension of the R&E credit.

We would be happy to work with Congress on a bipartisan basis to find a way to extend the R&E credit on a revenue-neutral basis.

STATEMENT OF THE U.S. CHAMBER OF COMMERCE
[BY WILLIAM T. SINCLAIRE, SENIOR TAX COUNSEL AND DIRECTOR OF TAX POLICY]

The U.S. Chamber of Commerce appreciates this opportunity to express its views on the research and experimentation tax credit and the research and development expense allocation rules. The Chamber is the world's largest business federation, representing 220,000 business members, 3,000 state and local chambers of commerce and 1,200 trade and professional associations.

RESEARCH AND EXPERIMENTATION CREDIT

The research and experimentation credit (R&E credit) contained in Section 41 of the internal Revenue Code was designed to reward businesses for increasing ex-

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[1] The current statutory suspension of the Treasury's regulations governing the allocation and apportionment of research and development expenses between U.S. and foreign source income will expire no later than July 31, 1995. The Administration supports a revenue-neutral extension of this provision.

penditures in research and development. However, the R&E credit is due to expire on June 30, 1995, and the Chamber believes it should be made permanent because it benefits the overall economy in both the short and long term.

The best way our country can maintain its competitive edge in the global economy is through increased innovation and technological development. Research and development cycles can last for many years, and high levels of research and experimentation must be performed continuously to achieve desired results. Because the R&E credit stimulates innovation and product development, it should not only be extended, but it should be made permanent so companies can rely on it during their budgetary processes.

The R&E credit was initially enacted as part of the Economic Recovery Act of 1981. Originally, the credit was equal to 25 percent of the excess of qualified research expenses incurred in the tax year over the average of qualified research expenses incurred in the three prior tax years. The credit was to expire at the end of 1985, however, it was extended through the end of 1988 by the Tax Reform Act of 1986. This act also modified the credit by (a) reducing the credit to 20 percent, (b) tightening the definition of the expenses eligible for the credit, and (c) enacting a separate, university basic research credit. Thereafter, the Technical and Miscellaneous Revenue Act of 1988 extended the research tax credit through the end of 1989 and reduced the deduction allowed for qualified research expenses by an amount equal to 50 percent of the research tax credit determined for the year.

The Omnibus Budget Reconciliation Act of 1989 extended the credit through the end of 1990 and further reduced the deduction allowed for qualified research expenses by an amount equal to 100 percent of the research tax credit determined for the year. The Omnibus Budget Reconciliation Act of 1990 extended the research credit through the end of 1991.

The research tax credit was extended for an additional six months through June 30, 1992, by the Tax Extension Act of 1991. The Omnibus Budget Reconciliation Act of 1993 extended it further through June 30, 1995, and amended the rules determining the fixed-based percentage of start-up companies.

With the R&E credit having been renewed six times and modified four times since 1981, uncertainty abounds in the business community and long-term planning for research and development can be precarious. This uncertainty reduces the incentive value and effectiveness of the R&E credit. in order for businesses to make the necessary time and cost commitments for initial and continuing research and development projects, a permanent R&E credit is required.

A permanent R&E credit will remove uncertainty and allow businesses to plan and undertake long-term research projects. This will enhance American technology, increase our productivity and competitiveness in the global marketplace, create high-paying jobs, and improve our overall quality of life.

RESEARCH AND DEVELOPMENT EXPENSE ALLOCATION

American businesses that conduct most of their research and development in the United States are at an international competitive disadvantage if they have foreign operations with foreign source income. The research and development allocation regulations (861 allocation regulations), contained in Section 1.861-8(e)(3) of the Treasury Regulations, were first issued in 1977 and have been debated significantly ever since. This debate has developed because U.S. multinational companies with foreign source income are required, for purposes of determining their foreign tax credits, to treat a portion of their domestic research and development expenses (R&D expenses) as if it was conducted abroad. This has effectively led to double taxation for American companies since no foreign country allows a deduction for R&D conducted in the U.S.

The requirement that a portion of R&D performed in the U.S. be treated for tax purposes as if it were conducted in a foreign country creates a disincentive for American businesses to undertake R&D in the U.S. and encourages the movement of R&D abroad. Moving R&D out of the U.S. runs counter to the goal of fostering investment in R&D in the U.S. and is clearly not in our national best interest.

The double taxation problem arose when the Treasury Department first drafted the 861 allocation regulations in 1977. Since then, a number of measures designed to prevent the full implementation of the regulations have been advocated and adopted by subsequent Administrations and Congresses. Starting in 1981, and continuing through 1986, the 861 allocation regulations were suspended and taxpayers were allowed to allocate 100 percent of their U.S. R&D expenses to U.S. source income, irrespective of their worldwide sources of income. in 1987, this suspension was modified to allow a 50 percent exclusive apportionment to U.S. source income. From 1988 to 1992, with the exception of a short period during 1988 and 1989, a

series of provisions were enacted to generally permit a 64 percent exclusive apportionment of U.S. R&D expenses to U.S. source income.

In 1992, the Treasury Department effectively allowed taxpayers to elect out of the 861 allocation regulations for two years in exchange for other rules when it announced that it was undertaking a review of the regulations to determine if they provided for a proper allocation or apportionment. Thereafter, further legislation suspended the 861 allocation regulations through December 31, 1994.

Unless there is a regulatory or legislative solution, the 861 allocation regulations drafted in 1977 will apply to all tax years beginning after 1994. American multinational businesses involved in U.S. R&D will effectively be subject to double taxation to the extent U.S. R&D expenses are allocated to non-U.S. source income.

The Chamber believes that a permanent resolution to the 861 allocation regulations issue is necessary to ensure that the goal of encouraging American companies to invest in research and development within the U.S. is achieved. American technology has been a major source of our export strength and world leadership. U.S.-based research and development is essential to sustaining America's competitiveness and is critical to our nation's continued economic growth. Advances in technology are vital to creating high-wage jobs and enhancing the position of American businesses in the world economy.

CONCLUSION

The Chamber urges enactment of a permanent R&E credit and finality to the 861 allocation regulations issue. Making the R&D credit permanent will best serve the country's long-term economic interests since it will eliminate the uncertainty about the future of the credit and permit businesses to make important research and development business decisions with certainty. Innovation greatly contributes to overall economic growth, increases productivity, creates new, better and higher-paying jobs, and allows for a higher standard of living. Providing for a favorable and definitive resolution to the 861 allocation regulations issue is essential to having an environment that is conducive to R&D investment in the U.S. It is necessary that R&D remain in this country so that high-paying jobs do not move abroad. American technology has been a major source of U.S. export strength and is vital to American businesses remaining in leadership positions in our global economy.

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE DEPARTMENT
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WILLIAM F. WELD
GOVERNOR

ARGEO PAUL CELLUCCI
LIEUTENANT GOVERNOR

May 8, 1995

The Honorable Robert Packwood
Chairman
Committee on Finance
SD-219 Dirksen Senate Office Building
Washington, DC 20510

Dear Chairman Packwood:

As you know, the federal research and development tax credit is scheduled to expire on June 30, 1995. As Governors of seven of the largest industry-based R&D states in the nation, we are writing to seek your assistance in securing a permanent extension of the federal R&D tax credit. We believe this is the type of market-based, pro-growth tax policy that our party should champion.

In 1981, President Reagan signed into law a four-year R&D tax credit to help stimulate the growth and competitiveness of our technology-based economy. The results have been impressive. Recent studies indicate that the marginal effect of one dollar of the R&D credit stimulates approximately one additional dollar of private research and development spending over the short run, and as much as two dollars of extra R&D in the long-run. Today, in our seven states, the private sector alone spends more than $60 billion per year on R&D. These investments support thousands of highly skilled employees in some of our nation's most promising industries, such as computer hardware and software, biotechnology, telecommunications, pharmaceuticals, and environmental technologies.

As significant as the benefits of the R&D credit are, however, they have been limited by the credit's temporary nature and uncertain future. Since its inception, the R&D credit has been allowed to expire five times, being renewed once retroactively. This uncertainty has hampered the private sector's ability to rely on the credit, forcing many research planners to discount its value when calculating long-term R&D related investments. Given the lengthy nature of R&D projects--frequently spanning five to ten years--permanent extension of the credit would greatly enhance its incentive value and overall effectiveness in stimulating increases in private sector R&D.

Unfortunately, the problems posed by the temporary nature of the credit are also exacerbated by our foreign competitors' generous tax incentives for R&D, including deductibility of current research expenses and special tax credits. Such incentives have caused many U.S. employers to consider the option of transferring their R&D functions oversees to remain competitive in the international marketplace. As a result, our nation runs the risk of becoming an importer, rather than an exporter, of technology and technologically advanced products in the years ahead.

We believe that the Republican Party has a unique opportunity to demonstrate to employers and the nation that we are committed to the principles of long-term economic growth and smaller government; a permanent R&D tax credit delivers both these principles. As a market-based incentive, a permanent R&D tax credit keeps Washington out of the game of picking winners and losers, while fostering an environment conducive to rewarding the patient, technologically based investments of our finest entrepreneurs. By letting the private sector do what it does best, the credit is one of the federal government's most effective means of encouraging real economic growth in the twenty-first century.

Your support is vital to enact a permanent credit in 1995. We look forward to working with you to achieve this important goal in the months ahead.

Sincerely,

Governor Bill Weld

Governor Pete Wilson

Governor George E. Pataki

Governor John Engler

Governor Christine T. Whitman

Governor Jim Edgar

Governor George W. Bush

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