Qualified Research Activities

ORS 317.152, 317.153	Year Enacted:	1989	Transferable:	No
317.154	Length:	1-year	Means Tested:	No
	Refundable:	No	Carryforward:	5-year
TER 1.416, 1.417	Kind of cap:	Taxpayer	Inflation Adjusted:	No

Policy Purpose

Statute does not contain a specific policy purpose for this tax credit. Bill documentation for the implementing legislation indicates a desire to "encourage research in Oregon" and to "provide a good climate for business." There are also references to the uncertainty of the federal credit due to its potential sunset. A reasonable interpretation is that the tax credit is intended to promote a level of research activity in Oregon that is higher than if the credit were not available, and to increase innovation and economic activity.

Description and Revenue Impact

Corporation taxpayers are allowed a credit of up to $1 million per year for Qualified Research Expenses (QRE) in Oregon that exceed a base amount. There are two possible calculations. The primary credit is five percent of the excess amount and has a five-year carryforward. Because this credit is tied to the federal research tax credit, definitions and calculations are generally contained in IRC §41. The two major differences are that the Oregon credit is only for research conducted in Oregon and the credit percentage is five instead of 20.[3]

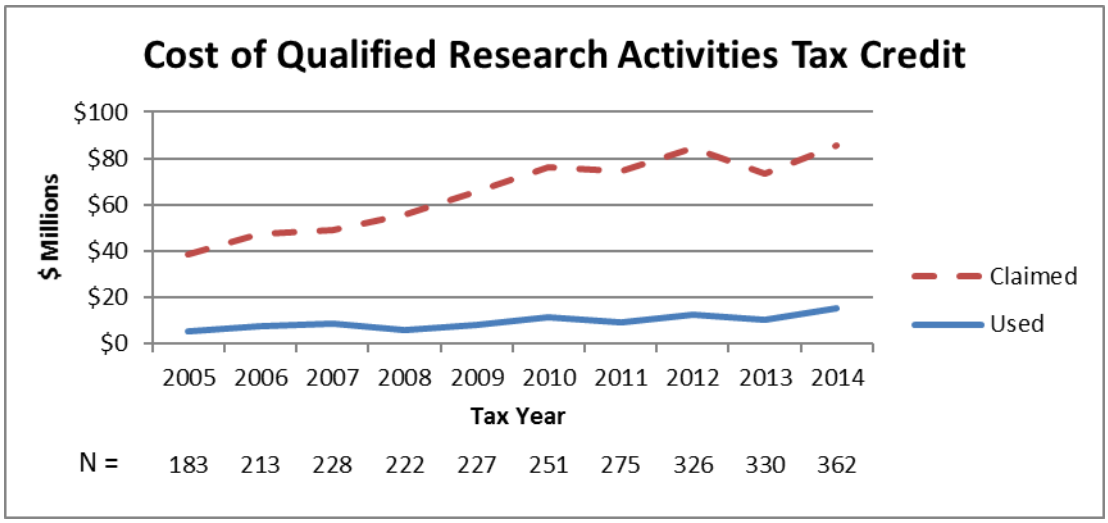
An alternative calculation for the tax credit is allowed. It equals five percent of the amount of expenses that exceed 10 percent of Oregon sales. It is the lesser of one million dollars or $10,000 times the number of percentage points by which expenses exceed the sales threshold.

The primary tax credit is the most commonly used approach; that formula is provided below. The base amount is determined as per federal law. For a detailed description of the federal credit, see Appendix F.

$$Credit = 5\% * (QRE_t - \ base\ amount)$$

The chart below shows the history of the tax credit as reported on income tax returns. Between 2005 and 2014, the amount claimed doubled from about $40 million to just over $80 million. The amount actually used to reduce tax liability grew from $5 million to $15 million. This translates into a usage rate of 14 percent on average; it ranged from 11 percent to 18 percent. Much of the amount claimed each year is a carryforward from the prior year. These carryforwards are limited to five years.

[3] After many years of debate, the federal R&D tax credit was made permanent in 2015.



Policy Analysis

Public support for research broadly comes in two forms: direct funding through grants and indirect funding through tax subsidies. Privately funded R&D is generally conducted when private entities stand a good chance of benefitting from the commercialization of their research. At a high level, research ranges from "general knowledge" to "market oriented." The former type has no clear commercial applications in the near term and tends to be funded by governments. For the latter type, markets may have already been identified along with potential profit estimates. The theoretical basis for the public funding of private research is that the private sector will not produce the optimal amount of research because profits may not be fully capitalized.

Theoretically, an individual firm will invest in research activities to the point where it believes its expenses will yield an adequate return-on-investment. Any potential societal gains, or positive externalities, will be ignored. If properly determined, however, a tax incentive reduces costs to increase the amount of research to a socially optimal level. Proponents argue that a public subsidy will encourage additional research to the point where the marginal costs of private and public research will equal marginal social benefits.

The Organization for Economic Co-operation and Development (OECD) identified two market failures that support the case for public incentives for funding private sector R&D investment. First, private firms are often unable to capitalize the full benefits of research, which leads to under-investment in innovation. They recommend a combination of tax incentives and property rights to address such externalities. Second, a shortage of capital exists, especially for start-ups, due to the risky nature of R&D investments. Tax incentives are a market-based tool that help reduce marginal costs while allowing the private sector to determine specific research projects.

Opponents argue that public dollars should not be spent to help improve a company's market share or profit margin. Roughly speaking, they feel an incentive, either state or federal, constitutes a windfall to the recipients. Given the competitive nature of global markets in today's economy, they posit companies are will conduct research regardless of the tax subsidy. Basically, markets are so competitive that they effectively require companies to conduct research or risk falling behind their competitors.

The focus of this analysis is on one aspect of publicly subsidized research. Oregon's R&D tax credit is based on the federal credit, so the analysis begins with the federal tax credit. Most of the academic literature compares these incentives at the national level or across countries. The OECD has identified a variety of ways that countries subsidize research: volume tax credits, incremental tax credits, tax concessions as a percent of expenditures, payroll tax credits for research-related wages, and preferential tax rates for royalty or other knowledge-based income. The U.S. tax credit is of the incremental variety and, therefore, so is the Oregon tax credit.

Bloom, et. al., note that economic theory places an emphasis on the accumulation of R&D and human capital as key drivers of economic growth. They hypothesize that this could help explain, in part, growth differences across counties. To explore this idea, they examine manufacturing for a panel of countries (including the U.S.) from 1979 to 1997 and find that a 10 percent reduction in the cost of R&D led to a one percent increase in the R&D level in the short-run and a 10 percent increase in the long-run. They note that various factors may affect R&D spending including intellectual property rights, industry-university linkages, geographical location, and culture. They conclude that while R&D tax credits do have an effect, there are concerns about potential free-riders.

Griffith, et. al., also analyzed a panel of countries, focusing on sectoral data from 12 OECD countries over 17 years. They find that R&D helps promote both technological innovation but also technology transfer. They also find human capital to be more of a factor for innovation than technology transfer. The authors conclude that research studies that focus solely on the U.S. may have tendency to underestimate the social rate of return.

Some research finds that tax credits are less economically efficient than other incentives. For example, Fichtner and Michel (2015) argue that the most economically sound policy is to eliminate the federal R&D tax credit and offset the initial revenue impact by reducing statutory tax rates. They contend that while a tax credit likely induces additional R&D spending, this spending only partially translates into increased innovation. A better approach is to design an incentive directly tied to innovation. They point to empirical evidence indicating a decline in patent quality correlates to an increase in tax incentives. Short of this significant change in policy direction, however, they suggest incremental changes to the existing federal tax credit. Namely, they suggest eliminating modified claims on amended tax returns, expanding the definition of qualified research to match the definition used for the federal deduction, and limiting the structure to the Alternative Simplified Credit.[4]

Ernst, Richter, and Riedel study R&D incentives across European nations in a comparison of preferential rates and tax credits. They conclude that preferential tax rates lead to better research outcomes. Countries that offered incentives all benefitted from increased research spending, but

[4] Details are included in Appendix F.

countries that chose lower tax rates as the mechanism benefitted from higher quality research. Credits tend to be a function of spending and are, therefore, not correlated with research quality.

Other research points to the challenges of targeting an incentive directly to innovation. The Government Accountability Office finds that companies believe R&D directly affects profitability and that they correspondingly align their R&D efforts. They note that while it is easy to track R&D spending, there are several challenges involved in tracking ROI and tracing patents back to specific R&D dollars. These difficulties translate into challenges in establishing outcome-based metrics. In turn, the authors find that when faced with the collective nature of assessment challenges, companies tend to stress marketplace results and re-direct their R&D spending away from long-term projects toward shorter-term projects. This focus on short-term projects may be consistent with the notion of private investment occurring at a level that is not socially optimal.

While there is a great deal of research on the impact of federal tax credits, there is not a corresponding body of work on the impact of state tax credits. Despite this shortcoming, nearly 40 states have some form of a research tax credit. (Appendix B contains a table that summarizes these policies.)

Paff (2005) studied state level tax credits and found some evidence that R&D expenditures did increase due to the availability of the tax credit. She focused on the biopharmaceuticals and software industries in California and found variation across sectors. The positive link was limited to in-house spending; she found no connection between contract spending and tax credits. Wunder (2008) compared state corporate tax systems using a metric called the B-index and found that Oregon was tied for 25th with the most generous incentive out of 47 states.[5] It should be noted that this approach evaluates the combination of the incentive and underlying corporation tax structure in each state.

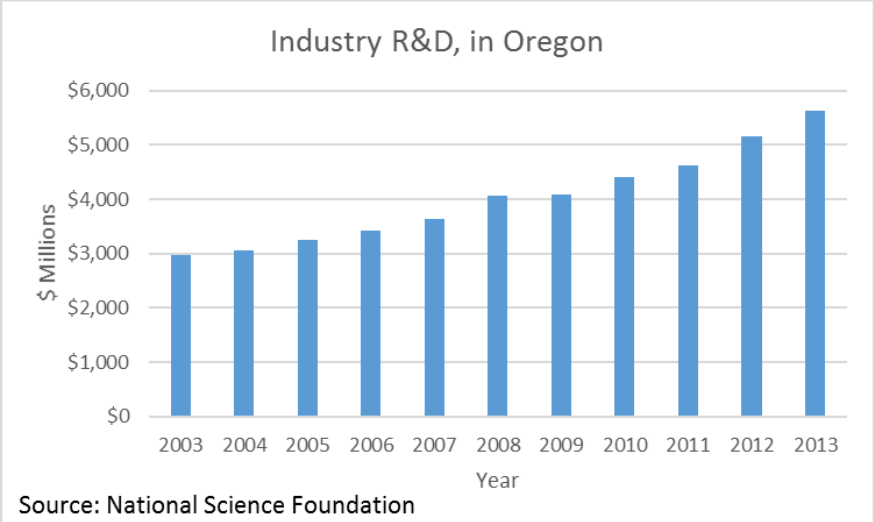
The Iowa Department of Revenue has occasionally conducted evaluations of their Research Activities Tax Credit, which is a 6.5 percent refundable credit on qualified research expenditures made in Iowa above a base amount. The most recent report was released in December 2011. The authors attempted to estimate the impact of the credit on research expenditures, related employment, and patent activity. Unfortunately, their results were not conclusive.

As Oregon policymakers consider the state incentive, the issue are related to, but different from, federal considerations. The argument for an incentive often turns on the notion that capital and labor are mobile and in today's technology driven economy, the demand for research activities is significant. Proponents often argue that mobility factors aside, the agglomeration forces of research activities are considerable, if not entirely quantifiable. As proof they point to the ubiquitous nature of these incentives.

A good contextual starting point is knowing the amount of research conducted in Oregon and who claims the tax credit. The graph below contains data from the National Science Foundation. It shows that from 2003 to 2013, industry funded research grew from just under $3 billion to $5.6 billion. During this time, the annual average growth rate for Oregon was 6.7 percent,

[5] B-index is a measure of pre-tax profit needed to break even on an additional dollar of R&D expense. A total of 51 states, including D.C., less four states without a corporate income tax results in 47 states.

compared to 4.7 percent nationally. That stronger growth moved Oregon from being ranked 19th in total dollars spent in 2003 to 17th in 2013. Oregon industry R&D spending in 2013 amounted to 2.9% of GDP and was $1,435 per capita. These metrics rank Oregon 8th and 9th, respectively, in the U.S.



Turning to an analysis of tax return data, the table below shows 2014 corporation tax return data for the number and amount of R&D tax credits reported by the amount of corporation sales in Oregon. In all, 376 corporations claimed a total of $85.6 million in tax credits, but only $15.2 million was used to reduce tax liability. That is a usage rate of 18 percent. A few patterns stand out from the data. The smallest corporations, the largest corporations, and those with Oregon sales between $25 and $50 million make-up 50 percent of the tax credits claimed. While the largest corporations accounted for 23 percent of credits claimed, they accounted for 58 percent of the credits actually used. The usage rate was lowest for the smallest corporations (one percent) and largest for corporations with sales between $20 and $25 million (53 percent). Another interesting aspect to the data is that roughly one-quarter (28 percent) of the credits were newly claimed in 2014; the remainder (72 percent) were carried forward from prior years.

R&D Tax Credits, $M, Tax Year 2014

Oregon Sales ($M)	Returns	Claimed	Share	Used	% used	New	Carryforward	% new
< $0.5	103	$10.7	13%	$0.1	1%	$3.8	$6.9	35%
$0.5 to $1	28	$1.9	2%	$0.0	2%	$0.5	$1.4	26%
$1 to $2	30	$3.1	4%	$0.1	3%	$0.9	$2.2	30%
$2 to $3	31	$3.6	4%	$0.2	4%	$1.1	$2.5	31%
$3 to $5	19	$2.7	3%	$0.1	4%	$1.0	$1.8	35%
$5 to $7	16	$2.0	2%	$0.2	8%	$0.6	$1.4	28%
$7 to $10	22	$6.8	8%	$0.5	7%	$1.2	$5.6	18%
$10 to $15	29	$7.1	8%	$0.6	9%	$1.5	$5.7	21%
$15 to $20	18	$3.8	4%	$0.6	17%	$0.8	$3.0	20%
$20 to $25	10	$1.4	2%	$0.7	53%	$1.0	$0.4	70%
$25 to $50	27	$13.2	15%	$1.0	8%	$2.4	$10.8	18%
$50 to $75	10	$5.0	6%	$1.0	21%	$1.5	$3.4	31%
$75 to $100	9	$4.3	5%	$1.2	27%	$1.4	$3.1	31%
$100 or more	24	$20.1	23%	$8.8	44%	$6.1	$14.0	30%
Total	376	$85.6	100%	$15.2	18%	$23.7	$62.1	28%

The table below shows the same 2014 data but organized by industrial sector. The dominant sectoral use of the credit is manufacturing, representing 35 percent of the claimants, 41 percent of the amount claimed, and 54 percent of the amount used. The second largest user is the Professional, Scientific, and Technical Services firms. They accounted for 23 percent of the claimants, 24 percent of the amount claimed, but only 10 percent of the amount used. Information Services was the second largest tax credit user in 2014.

R&D Tax Credits, $M, Tax Year 2014

Sector	Returns	Share	Claimed	Share	Used	Share
Manufacturing	131	35%	$34.8	41%	$8.2	54%
Wholesale Trade	37	10%	$5.8	7%	$0.5	3%
Information	65	17%	$12.1	14%	$2.5	17%
PST Services	86	23%	$20.4	24%	$1.6	10%
MoC	21	6%	$9.8	11%	$2.1	14%
Other	36	10%	$2.9	3%	$0.3	2%
Total	376	100%	$85.6	100%	$15.2	100%

PST = Professional, Scientific, and Technical

MoC = Management of Companies

The table below shows the same information by taxable income. The amount claimed was largely split between those with income losses and those with the income above $10 million. Not unexpectedly, the vast majority of tax credits used was for those companies with at greatest amount of taxable income.

R&D Tax Credits, $M, Tax Year 2014

Taxable Income	Returns	Share	Claimed	Share	Used	Share
Less then $0	168	45%	$38.4	45%	$0.9	6%
$0 to $500,000	66	18%	$1.9	2%	$0.2	1%
$500,000 to $1 Million	18	5%	$1.3	1%	$0.2	2%
$1 Million to $5 Million	33	9%	$1.9	2%	$0.7	5%
$5 Million to $10 Million	10	3%	$1.2	1%	$1.0	6%
$10 Million or more	81	22%	$41.0	48%	$12.2	80%
Total	376	100%	$85.6	100%	$15.2	100%

The table below shows the distribution of the size of tax credits claimed in 2014. About half of the credits claimed are less than $25,000; the average amount was roughly $8,500. At the top end of the distribution, the impact of carryforwards can be seen. With an annual cap of $1 million for new credits, carryforwards account for roughly another $1.5 million.

R&D Tax Credits, $M, Tax Year 2014

Amount of Credit	Returns	Claimed ($M)	Average ($)	Used ($M)	Average ($)
< $25,000	187	$1.6	$8,448	$0.7	$3,784
$25,000 to $25,000	40	$1.4	$35,346	$0.5	$12,109
$50,000 to $75,000	21	$1.3	$61,584	$0.5	$22,256
$75,000 to $100,000	15	$1.3	$86,085	$0.2	$13,862
$100,000 to $200,000	40	$5.8	$145,347	$1.6	$41,112
$200,000 to $300,000	25	$5.9	$236,215	$2.1	$83,121
$300,000 to $500,000	10	$3.8	$383,585	$0.8	$82,889
$500,000 to $1,000,000	17	$12.0	$703,190	$1.0	$60,621
> $1,000,000	21	$52.5	$2,501,211	$7.7	$367,542
Total	376	$85.6	$227,694	$15.2	$40,339

If the combination of Oregon's tax rates and R&D credit is middle-of-the-pack, as Wunder's work suggests, and the state is ranked in the top ten for industry R&D spending, the policy questions then turn on expected results of any change in the tax credit. However, there is ongoing disagreement about the behavioral response of firms to the existing tax credit. If the tax credit were eliminated, some stakeholders argue that companies may look to relocate their research efforts to other states. Skeptics argue that the existing policy, even without an enhancement, represents a windfall to companies. Research indicates preferential tax rates would be more efficient, but likely to be administratively complicated. The existing tax credit, however, is simple and, while it may not be theoretically optimal, has minimal administrative costs.

Another consideration is our current tie to federal law. If a tax credit is a second best solution, there still exists the question of whether to continue with the existing policy or disconnect from the federal policy and establish a stand-alone Oregon credit. Many of the flaws of the federal credit could be minimized or possibly eliminated. The incentive could be refined to reflect specific goals or concerns unique to Oregon. A key question is whether or not the elimination of the simplicity of the current policy is worth a refined Oregon policy.

Other Issues

The administrative costs of this tax credit are minimal. The OBDD is tasked with no particular role in administering or monitoring its use. The DOR does incur some incremental expense to administer the tax credit. It is one of several tax credits included on the tax forms and is subject to audit activities. Because the basis for the credit is tied to federal law, there may be some efficiency in the state benefitting from audit activity conducted by the IRS. Most states with a corporate income tax offer a research tax credit. Appendix B contains a table that highlights the key aspects of their tax credits.

Key Characteristics of Tax Credits Offered by Other States

- A percentage of all research costs
- A percentage of incremental research costs
- A combination of volume and incremental costs
- Tied to IRC definitions

In Summary:

Advantages	• Ease of administration
Disadvantages	• Much of the credit remains unused each year • Limited to corporations
Potential Modifications	• Disconnect from federal policy & create an Oregon tax credit • Make refundable, perhaps for small or young companies • Vary by type of R&D • Limit by type and/or size of company • Extend to other business structures • Modify ‘base year’ for today’s firms • Repeal tax credit and replace with lower tax rates on patent income • Limit to certain types of projects