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| PROPOSED MASSACHUSETTS TAX EXPENDITURES  EVALUATION SUMMARY |
| EVALUATION YEAR: 2020 |

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| **TAX EXPENDITURE TITLE** | Research Credit |
| **TAX EXPENDITURE NUMBER** | 2.604 |
| **TAX EXPENDITURE CATEGORY** | Credit against tax *(corporate and business tax)* |
| **TAX TYPE** | Corporate excise tax |
| **LEGAL REFERENCE** | M.G.L. c. 63, § 38M |
| **YEAR ENACTED** | 1991 |
| **REPEAL/EXPIRATION DATE** | The credit itself is not set to expire. However, certain provisions relating to special treatment for defense contractors are set to expire in 2028. |
| **ANNUAL REVENUE IMPACT** | Tax loss of $288.4 - $477.6 million per year during FY18-FY22 |
| **NUMBER OF TAXPAYERS** | 2,919 – 4,059 claims per year during tax years 2015-2018 |
| **AVERAGE TAXPAYER BENEFIT** | About $60,600 – $82,300 per claim during tax years 2015-2018 |

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| **Description of the Tax Expenditure:**  Massachusetts provides corporations a credit for increased spending in research and development activity conducted in Massachusetts. The Massachusetts research credit, in large part, is based on the research credit allowed under Internal Revenue Code (Code) § 41. | **Is the purpose defined in the statute?**  The statute does not explicitly state the purpose of this tax expenditure. |
| **What are the policy goals of the expenditure?**  DOR infers that it was intended to encourage research and development in Massachusetts. | **Are there other states with a similar Tax Expenditure?**  Yes, DOR estimates that over 30 states have a similar expenditure. |

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| Conclusion/Recommendations: [To be Entered by TERC] |

**INTRODUCTION**

Massachusetts provides corporations a credit for increased spending in research and development. The credit is available only for expenditures for research activity conducted in Massachusetts. The Massachusetts research credit, in large part, is based on the research credit allowed under Internal Revenue Code (Code) § 41. In particular, the alternative simplified method for calculating the credit is modeled after the federal alternative simplified method. The credit can be shared among affiliated corporations that are members of the same combined group, subject to limitations.

There are two methods for calculating the Massachusetts research credit. Under one method, the amount of the credit is equal to: 10% of the difference between the current year's Massachusetts qualified research expenses and a “base amount” plus 15% of the Massachusetts basic research payments for the taxable year as determined under Code § 41(e)(1)(A). The actual computation of the credit under this method can be complex. Pursuant to legislation enacted in 2014, a taxpayer can now elect to determine its credit using the so-called “alternative simplified method.” This method is based on the federal simplified method which was enacted in 2006. Using this method, the amount of the credit is equal to a percentage of the difference between the corporation’s qualified research expenses for the current taxable year and 50% of the corporation’s average qualified research expenses for the 3 taxable years preceding the taxable year for which the credit is being determined. The percentage used to calculate the credit under the alternate simplified method is being phased in over a 7-year period. For calendar years 2015, 2016 and 2017, a rate of 5 percent was used to calculate the credit under the alternative simplified method, for calendar years 2018, 2019 and 2020, that rate was 7.5 percent and for calendar years beginning on or after January 1, 2021, the rate is 10 percent.

Regardless of which method the corporation uses to determine the credit amount to which it is entitled for a taxable year, the amount of research credit that can be used in a taxable year is limited to 100 percent of a corporation's first $25,000 of excise, plus 75 percent of the corporation's excise in excess of $25,000. A single $25,000 amount applies to affiliated groups of corporations. Credit not used because of the limitations generally can be carried over for 15 years. In certain instances the credit can be carried forward indefinitely.

The research credit is not transferable and generally is not refundable. However, a certified Life Science Company may apply to the Massachusetts Life Science Center for a refund of a portion of its available excess research credits in lieu of carrying such credits forward for use in later years.

**POLICY GOALS**

The statute does not explicitly state the purpose of this tax expenditure. However, contemporaneous accounts of the enactment of the credit indicate that it was intended to encourage research and development in Massachusetts.

**DIRECT COSTS**

The revenue loss resulting from the expenditure is estimated to be $288.4 - $477.6 million per year during FY18-FY22. See Table 1. The estimates are based on several factors, including historical claims, economic forecasts, and related law changes.

**Table 1. Tax Revenue Loss Estimates for Research Credit**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fiscal Year | 2018 | 2019 | 2020 | 2021 | 2022 |
| Estimated Revenue Loss ($Million) | $288.4 | $337.6 | $344.3 | $410.3 | $477.6 |

Table 2 below shows the amount and number of available, claimed, and shared credits in each year during the period 2015 through 2018. “Available credit” refers to the maximum amount of credit that a taxpayer can claim based on tax liability, provided there are no other restrictions. “Claimed credit” is the amount a taxpayer actually claimed. “Shared credit” is the amount of a taxpayer’s credit that was used by other members of the taxpayer’s combined group. “Count” refers to the number of credit claims.

During the tax years 2015 through 2018, the number of credits claimed or shared annually varied from 2,919 to 4,059, and the average claimed or shared amount was about $60,600 - $82,300 per year. The total amount of credit claimed or shared was 6.3%-8.2% of the amount of credit available, meaning that tax filers did not have enough tax liability to take full advantage of the credit, or certain statutory limitations[[1]](#footnote-1) prevented them from doing so.

**Table 2. Amount and Count of Research Credit by Tax Year**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 2015 | | 2016 | | 2017 | | 2018 | |
| Amount ($000) | Count | Amount ($000) | Count | Amount ($000) | Count | Amount ($000) | Count |
| Available Credit -A | $3,002,410 | 10,666 | $3,207,342 | 11,819 | $3,250,400 | 13,361 | $4,059,419 | 15,348 |
| Claimed Credit | $148,849 | 2,657 | $154,010 | 2,996 | $178,598 | 3,280 | $266,186 | 3,714 |
| Shared Credit | $50,152 | 262 | $48,081 | 338 | $63,897 | 348 | $68,029 | 345 |
| Claimed plus Shared Credit - B | $199,001 | 2,919 | $202,091 | 3,334 | $242,496 | 3,628 | $334,216 | 4,059 |
| B/A | 6.6% | 27.4% | 6.3% | 28.2% | 7.5% | 27.2% | 8.2% | 26.4% |
| Average Claimed or Shared Amount | $68.2 | NA | $60.6 | NA | $66.8 | NA | $82.3 | NA |

Source: Massachusetts Department of Revenue.

Notes: 1. 2017 and 2018 data are preliminary and subject to change.

2. “NA” means not applicable.

**DIRECT BENEFITS**

This is a popular and significant tax incentive and has been claimed by many corporations, compared to other tax incentives. The incentive reduces expenses paid by corporations for R&D activities. It is incremental and aims to reimburse taxpayers for increasing research expenses over their historical levels. A recent study (Rao, 2016) demonstrates that a ﬁrm’s research intensity, which is the ratio of R&D expenditures to sales, responds to changes in the cost of R&D. The study finds that a 10% reduction in the cost of R&D leads the average ﬁrm to increase its research intensity by 19.8% in the short run. In the long run, the average firm responds with further increases in spending.

Tables 3-5 show the number of claimants and claim amounts by income level (Table 3), industry (Table 4), and size of taxpayer in terms of number of employees (Table 5), respectively, for the 2017 tax year.[[2]](#footnote-2) The tables show that, 59.2% of claimants were corporations with taxable income less than $10,000, 68.6% of claimants were corporations with less than 100 employees, and 68.0% of claimants were in the industries of manufacturing and professional, scientific, & technical services.

The tax benefit per claimant averaged $70,493, varying from $11,402 for unmatched filers to $913,918 for the corporations with $10 million or higher taxable income, from $11,402 for unmatched filers to $258,438 for the corporations with 500 or more employees, and from $2,144 for corporations in the “Accommodation and Food Services” industry to $213,151 for corporations in the “Unmatched or others” industry.

**Table 3. 2017 Research Credit Claims by Taxable Income Level**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Taxable Income Range | Tax Liability after Credit ($000) | Claimed Credit ($000) | Shared Credit ($000) | Number of Claimants | Percent of Total Number of Claimants | Tax Saving per Claimant ($) |
| Less than $0 | $3,234 | $17,668 | $3,176 | 1,082 | 31.5% | $19,264 |
| 0 to $9,999 | $1,248 | $75,463 | $32,019 | 951 | 27.7% | $113,021 |
| $10,000 to $99,999 | $630 | $7,501 | $606 | 324 | 9.4% | $25,022 |
| $100,000 to $999,999 | $6,585 | $13,306 | $2,688 | 536 | 15.6% | $29,840 |
| $1,000,000 to $9,999,999 | $32,327 | $30,855 | $3,831 | 439 | 12.8% | $79,010 |
| $10,000,000 or more | $85,900 | $33,257 | $21,578 | 60 | 1.7% | $913,918 |
| Unmatched\* | NA | $547 | $0 | 48 | 1.4% | $11,402 |
| Total or average | $129,924 | $178,598 | $63,897 | 3,440 | 100.0% | $70,493 |

Source: Department of Revenue (2017 corporate excise returns)

Notes: 1. \*Unmatched means that we could not find some taxpayers in one or more of the data sets to match.

2. The data are preliminary and subject to change.

**Table 4. 2017 Research Credit Claims by Industry**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Industry | Tax Liability after Credit ($000) | Claimed Credit ($000) | Shared Credit ($000) | Number of Claimants | Percent of Total Number of Claimants | Tax Saving per Claimant ($) |
| 11 Agriculture, Forestry, Fishing and Hunting | $2 | $13 | $0 | 5 | 0.2% | $2,593 |
| 22 Utilities | $293 | $272 | $0 | 3 | 0.1% | $90,527 |
| 23 Construction | $1,158 | $1,679 | $3 | 73 | 2.1% | $23,035 |
| 31-33 Manufacturing | $55,381 | $58,792 | $36,300 | 1,138 | 33.1% | $83,561 |
| 42 Wholesale Trade | $7,878 | $4,448 | $994 | 110 | 3.2% | $49,477 |
| 44-45 Retail Trade | $14,070 | $834 | $1 | 37 | 1.1% | $22,563 |
| 48-49 Transportation and Warehousing | $52 | $101 | $200 | 7 | 0.2% | $43,040 |
| 51 Information | $7,424 | $10,652 | $1,842 | 226 | 6.6% | $55,283 |
| 52 Finance | $2,315 | $2,003 | $531 | 56 | 1.6% | $45,243 |
| 53 Real Estate and Rental and Leasing | $98 | $4,653 | $442 | 26 | 0.8% | $195,968 |
| 54 Professional, Scientific, and Technical Services | $23,693 | $25,234 | $5,541 | 1,200 | 34.9% | $25,646 |
| 55 Management of Companies and Enterprises | $9,128 | $17,149 | $1,323 | 143 | 4.2% | $129,175 |
| 56 Administrative and Support and Waste Management and Remediation Services | $1,134 | $1,571 | $183 | 35 | 1.0% | $50,118 |
| 61 Educational Services | $366 | $79 | $0 | 10 | 0.3% | $7,887 |
| 62 Health Care and Social Assistance | $60 | $1,095 | $538 | 40 | 1.2% | $40,816 |
| 71 Arts, Entertainment, and Recreation | $1 | $23 | $22 | 3 | 0.1% | $14,852 |
| 72 Accommodation and Food Services | $53 | $9 | $0 | 4 | 0.1% | $2,144 |
| 81 Other Services (except Public Administration) | $191 | $316 | $3 | 16 | 0.5% | $19,977 |
| Unmatched\* or others | $6,629 | $49,676 | $15,974 | 308 | 9.0% | $213,151 |
| Total or average | $129,924 | $178,598 | $63,897 | 3,440 | 100.0% | $70,493 |

Source: Department of Revenue (2017 corporate excise returns)

Notes: 1. \*Unmatched means that we could not find some taxpayers in one or more of the data sets to match.

2. The data are preliminary and subject to change.

**Table 5. 2017 Research Credit Claims by Taxpayer Size (Number of Employees)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Employees Range\* | Tax Liability after Credit ($000) | Claimed Credit ($000) | Shared Credit ($000) | Number of Claimants | Percent of Total Number of Claimants | Tax Saving per Claimant ($) |
| Less than 5 | $20,563 | $44,920 | $26,610 | 717 | 20.8% | $99,763 |
| 5 to 49 | $19,921 | $14,918 | $1,831 | 1,223 | 35.6% | $13,695 |
| 50 to 99 | $6,753 | $8,221 | $796 | 420 | 12.2% | $21,470 |
| 100 to 199 | $8,653 | $18,756 | $8,370 | 342 | 9.9% | $79,317 |
| 200 to 499 | $7,076 | $15,032 | $2,479 | 303 | 8.8% | $57,790 |
| 500 or more | $66,958 | $76,204 | $23,811 | 387 | 11.3% | $258,438 |
| Unmatched\*\* | NA | $547 | $0 | 48 | 1.4% | $11,402 |
| Total or average | $129,924 | $178,598 | $63,897 | 3,440 | 100.0% | $70,493 |

Source: Department of Revenue (2017 corporate excise returns)

Notes: 1. \* Information is based on number of employees as reported by taxpayers.

2. \*\*Unmatched means that we could not find some taxpayers in one or more of the data sets to match.

3. The data are preliminary and subject to change.

**EVALUATION: COMPARING COSTS AND BENEFITS**

In the previous sections, we reported the direct costs (to the Commonwealth, or to the residents and businesses who ultimately bear the costs when the Commonwealth cuts government spending or increase tax to finance the research credit) and direct benefits (to taxpayers who claim the benefits) of this tax expenditure. Since the direct costs to the Commonwealth are the direct benefits to taxpayers, they are equal.

However, when looking at the broader economy, there are, in addition to direct impacts, indirect and induced impacts on other residents and businesses in Massachusetts. See the appendix for more discussion.

To determine the net impact of the tax expenditure, i.e., the total benefits (including direct, indirect and induced benefits) offset by the total costs (including direct, indirect and induced costs), we employed the model of “Tax-PI” developed by Regional Economic Models Incorporated (“REMI”).[[3]](#footnote-3) See the appendix for details.

The estimated net impact of the tax expenditure for fiscal years 2018 through 2022 are shown in Tables 6 and 7. As shown, the research tax credit combined with a cut in state government spending of the same amount results in less economic activities, with real state GDP decreasing by $128 million-$191 million. The net impact on total employment is negative, decreasing by 2,479 – 3,226 jobs annually. The net additional impact on state revenues[[4]](#footnote-4) is also negative, decreasing by $4.4 million- $10.0 million annually.

**Table 6. Net Additional Revenue Impact of Research Credit\***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fiscal Year | 2018 | 2019 | 2020 | 2021 | 2022 |
| Net additional revenue impact ($000) | -$4,367 | -$8,755 | -$8,279 | -$9,284 | -$10,035 |

\* assuming state government spending is cut by the same amount as the research tax credit to balance budget.

**Table 7. Net Economic Impacts of Research Credit by Selected Economic Measure\***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Calendar Year | 2018 | 2019 | 2020 | 2021 | 2022 |
| Impact on total employment | -3,071 | -2,731 | -2,479 | -3,226 | -2,880 |
| Impact on private non-farm employment | -67 | 267 | 466 | 633 | 892 |
| Impact on GDP ($000), real dollars (2012) | -$191,000 | -$155,000 | -$129,000 | -$164,000 | -$128,000 |
| Impact on personal income ($000) | -$204,000 | -$200,000 | -$195,000 | -$255,000 | -$242,000 |

\* assuming state government spending is cut by the same amount as the research tax credit to balance budget.

Because the tax expenditure has its own specific purpose, the net negative impacts do not necessarily imply that the tax expenditure is not desirable. Research credits encourage research and development activities that may create new products and new technologies, the value of which is hard to measure before they go to market, and therefore it is also difficult for the model to capture the impact of research and development activities on the economy accurately.

There are other costs and benefits that are difficult to quantify due to lack of data or other challenges. See the appendix for more discussion.

**SIMILAR TAX EXPENDITURES OFFERED by OTHER STATES**

Over 30 states have some form of research credit. The following are some examples.

**Maine**

Maine offers a research credit to corporations, sole proprietors, and members of pass- through entities such as partnerships, joint ventures or subchapter S corporations. The credit is based on the incremental increase in spending for qualifying research activities in Maine. The credit is equal to 5% of the excess, if any, of the qualified research expense in Maine for the taxable year over the average spent by the taxpayer on qualified research in Maine during the three prior tax years, plus 7.5% of the basic research payments made during the taxable year. An enhanced credit is available for research expenses that exceed 150% of the prior three year’s research expenses. The total credit claimed may not reduce the taxpayer’s income tax liability for any tax year to less than zero. For corporations, the credit is limited to 100% of the first $25,000 in income tax determined before other credits, plus 75% of the tax amount in excess of $25,000. Any unused credit amount may be carried forward for a total of 15 years. The Maine credit is not refundable.

**Connecticut**

Connecticut allows corporations a research credit for the incremental increase in research expenditures conducted in Connecticut. The credit amount is 20% of the excess of the research expenditures incurred in Connecticut during the current tax year over the amount of such expenditures during the preceding tax year. The credit can be carried forward for 15 years. The credit is generally not refundable. However, a qualified small business that cannot take the credit in a tax year as a result of having no tax liability may exchange the credit for a refund equal to 65% of the value of the tax credit, or may elect to carry the tax credit forward.

**Rhode Island**

Rhode Island offers an incremental research credit to corporations, sole proprietors, and members of pass-through entities. The credit is based on the taxpayer’s research expenses that are eligible for the federal credit (taking into account the federal base amount), to the extent that the expenses are incurred in Rhode Island. For periods January 1, 1998 and thereafter, the credit is 22.5% of eligible Rhode Island expenses up to $111,111 and 16.9% of the remaining expenses. The credit may not be used to reduce the tax below the minimum tax imposed by Rhode Island law. The credit that may be claimed is further limited to 50% of the tax otherwise payable, after all other credits available to the taxpayer have been used. Any amount of credit not used may be carried forward for a maximum of seven years. The credit is not refundable.

**New Hampshire**

New Hampshire offers a research credit against business taxes. The credit is available only by application to the state. Businesses that have qualified manufacturing research and development expenditures may apply for the credit. The amount of the credit is the lesser of 10% of the business organization's qualified manufacturing research and development expenditures or $50,000. Unused credit may be carried forward for five tax years. As of July1, 2017 the annual cap on the credit is $7 million. The credit is not refundable.

**Vermont**

Vermont provides a tax credit for increasing qualifying research activities. The Vermont credit is 27% of the federal tax credit that is attributable to research conducted in Vermont. This credit applies to personal income tax or business or corporate income tax. Any unused credit available may be carried forward up to 10 years. The credit is not refundable.

**New York**

New York offers a research credit to companies in certain industries that are considered strategic, including technology, financial services, manufacturing and agriculture. The credit is available only by application to the state. Approval criteria are based largely on the number of jobs created in the state. The credit is equal to 50% of the federal credit that is (i) allowed in the taxable year and (ii) attributable to research conducted in New York. Unused credit is refundable and the credit may only be claimed over a ten year period.

**California**

California offers an incremental research credit to both corporate and non-corporate taxpayers for qualified research and basic research conducted in California. The credit is equal to 15% of the excess of the qualified research expenses incurred in California, over the base amount, plus 24% of the basic research payments. The base amount is the portion of the federal base amount attributable to California. If the credit exceeds the tax for the taxable year, the excess may be carried forward to reduce the tax in the following year, and succeeding years, if necessary, until the credit has been exhausted. The credit is not refundable.

**Georgia**

Georgia offers a tax credit for incremental increases in research expenses for research conducted within Georgia for any business, or headquarters of any such business, engaged in manufacturing, warehousing, distribution, processing, telecommunications, tourism, broadcasting or research and development activities. The credit is 10% of the additional research expense incurred in Georgia over the base amount. The base amount is the average of Georgia research expenses incurred in the three prior years. To claim the Georgia credit for a tax year, a taxpayer must be able to claim a federal research credit in the same tax year. The credit may not exceed 50% of the business’ Georgia income tax liability, after all other credits have been applied. Any unused credit may be carried forward 10 years. Excess research tax credit earned in taxable years beginning on or after January 1, 2012, may be used to offset payroll tax withholding, as provided in the research credit regulation.

**IS THE INCENTIVE AS DESIGNED ACCOMPLISHING ITS PURPOSE?**

[FOR TERC TO COMPLETE]

References

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*MODELS: TAX-PI*. (n.d.). Retrieved from Regional Economic Models, Inc.: https://www.remi.com/model/tax-pi/

Rao, N. (2016). Do tax credits stimulate R&D spending? The effect of the R&D tax credit in its ﬁrst decade. *Journal of Public Economics*, 2.

**Appendix: Further Discussion on Costs and Benefits**

The text of the report discussed the direct costs (to the Commonwealth, or more specifically, to the Massachusetts residents or businesses who benefit from state expenditures[[5]](#footnote-5)) and direct benefits (to taxpayers who claim the benefits) of this tax expenditure. It also summarized indirect and induced costs and benefits associated with this tax expenditure. This appendix will discuss the indirect and induced, as well as other costs and benefits in more detail.

**Other costs and benefits: Indirect and Induced**

*Indirect and Induced Costs*

Regardless of its size, the existence of a specific tax incentive means less revenue for other spending given the Commonwealth’s balanced budget requirement assuming no increase in state revenues. Reduced spending on other expenditure items means forgone benefits from those items. This is an **opportunity cost** to the Commonwealth. The opportunity cost to the state include not only the impact on the businesses and their employees that directly benefit from those expenditure items (this is called “direct impact”), but also the indirect impact on the chain of businesses that provide intermediate products and services to the directly impacted businesses (this is called “indirect impact”). In addition, there is the cost to the chain of businesses that benefit when the employees working for the directly impacted businesses spend their wages and salaries to buy goods and services (this is called “induced impact”). The total forgone benefits to the whole economy are larger than the initial forgone benefits. This phenomenon is called the “Multiplier Effect”.[[6]](#footnote-6)

To estimate the total forgone benefits of the reduced spending, we employed Tax-PI, an economic analysis tool for evaluating the total fiscal and economic effects of tax policy changes. Tax-PI is built on over 30 years of experience in modeling the economic effects of tax policy changes, according to MODELS: TAX-PI in the reference. The popularity of the model has grown substantially since it was introduced. Note that while the tax incentive is for a specific purpose, the reduced spending is assumed to be made according to the current composition of the Commonwealth’s expenditure.

*Quantifying total costs (direct, indirect and induced)*

The period of study is limited to the five years from 2018 through 2022, for which we prepared input data to run the model. Tables A1 and A2 report the model results. The figures for 2018 and 2019 are estimates of forgone benefits (opportunity costs) that the Massachusetts economy experienced due to having the expenditure, and those for 2020, 2021 and 2022 are projections of forgone benefits that the Massachusetts economy will experience going forward. The effects are displayed as negative numbers as reduced spending has a negative impact on the state economy.

Tables A1 and A2 show that the reduction in state government spending results in lost economic activities, with real state GDP declining by $608 million-$845 million and total employment declining by 7,034 – 9,475 jobs annually. Lost economic activities result in further loss of state revenues, ranging from $13.0 million to $45.4 million annually. Note that the revenue impact reported in Table A1 does not include the estimated direct impact of the tax expenditure from Table 1, but only the additional indirect/induced impact.

**Table A1. Additional Revenue Impact due to Decreased Government Spending\***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fiscal Year | 2018 | 2019 | 2020 | 2021 | 2022 |
| Additional revenue impact ($000) | -$12,961 | -$28,371 | -$31,820 | -$39,016 | -$45,366 |

\*This table reports the lost revenues from the foregone economic activities as the state reduced government spending to finance the research tax credit.

**Table A2. Economic Impacts due to Decreased Government Spending by Selected Economic Measure\***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Calendar Year | 2018 | 2019 | 2020 | 2021 | 2022 |
| Impact on total employment | -7,034 | -7,228 | -7,446 | -9,475 | -9,152 |
| Impact on private non-farm employment | -3,879 | -3,985 | -4,122 | -5,159 | -4,889 |
| Impact on GDP ($000), real dollars (2012) | -$608,000 | -$630,000 | -$656,000 | -$845,000 | -$827,000 |
| Impact on personal income ($000) | -$507,000 | -$578,000 | -$646,000 | -$855,000 | -$893,000 |

\*This table reports the lost economic activities as the state reduced government spending to finance the research tax credit.

*Indirect and Induced Benefits*

The cost savings due to the research credit encourages the directly affected businesses to increase research and development spending, invest in new technology and equipment, and hire additional researchers and workers. Such decisions would increase demand for goods and services provided by other individuals and businesses in the economy, or put another way, generate a “Multiplier Effect” (see discussion in the previous section) from the initial or direct benefits as reported in the text. As a result, the total benefits of the tax credit would be larger than the initial or direct benefits.

*Quantifying total benefits (direct, indirect and induced)*

To quantify the total benefits, including indirect/induced benefits, we again employed Tax-PI. A summary of the revenue impact of the research credit is reported in Table A3, and the economic benefit from the credit is reflected in Table A4 below. The figures for 2018 and 2019 are estimates of benefits that the Massachusetts economy experienced and those for 2020, 2021 and 2022 are projections of the benefits that the Massachusetts economy will experience going forward.

Tables A3 and A4 show that, the research tax credit results in more economic activities, with real state GDP increasing by $417 million - $699 million and total employment increasing by 3,963 – 6,272 jobs annually. More economic activities result in more state revenues, ranging from $8.6 million to $35.3 million annually, which partially offsets the cost of this tax incentive.

**Table A3. Additional Revenue Impact of Research Credit**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fiscal Year | 2018 | 2019 | 2020 | 2021 | 2022 |
| Additional revenue impact ($000) | $8,594 | $19,616 | $23,541 | $29,732 | $35,331 |

**Table A4. Economic Impacts of Research Credit by Selected Economic Measure**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Calendar Year | 2018 | 2019 | 2020 | 2021 | 2022 |
| Impact on total employment | 3,963 | 4,497 | 4,967 | 6,249 | 6,272 |
| Impact on private non-farm employment | 3,812 | 4,252 | 4,588 | 5,792 | 5,781 |
| Impact on GDP ($000), real dollars (2012) | $417,000 | $475,000 | $527,000 | $681,000 | $699,000 |
| Impact on personal income ($000) | $303,000 | $378,000 | $451,000 | $600,000 | $651,000 |

**Comparison of costs and benefits**

If we don’t consider the opportunity cost of the tax incentive, total benefits are greater than costs. Considering the opportunity cost means asking what benefits would occur if the Commonwealth used the tax incentive for other purposes. There can be numerous other purposes and examining them is beyond the scope of the current evaluation report. Nonetheless, we reported net impacts of the tax incentive in Tables A5 and A6 below under the balanced budget requirement, which are the combined effects in Tables A1-A4.

Tables A5 and A6 show that the research tax credit combined with a cut in state government spending of the same amount results in less economic activities, with real state GDP decreasing by $128 million-$191 million. The net impact on total employment is negative with total employment decreasing by 2,479 – 3,226 jobs annually. The impact on state revenues is also negative, decreasing by $4.4 million- $10.0 million annually.

Because the tax expenditure has its own specific purpose, the net negative impacts do not necessarily imply that the tax expenditure is not desirable. Especially research credit encourages research and development activities that create new products and new technologies, the value of which is hard to measure before they go to market, and therefore it is also difficult for the model to capture the impact of research and development activities on the economy accurately.

**Table A5. Net Additional Revenue Impact of Research Credit\***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fiscal Year | 2018 | 2019 | 2020 | 2021 | 2022 |
| Net additional revenue impact ($000) | -$4,367 | -$8,755 | -$8,279 | -$9,284 | -$10,035 |

\* assuming the state government spending is cut by the same amount as the research tax credit to balance budget.

**Table A6. Net Economic Impacts of Research Credit by Selected Economic Measure\***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Calendar Year | 2018 | 2019 | 2020 | 2021 | 2022 |
| Impact on total employment | -3,071 | -2,731 | -2,479 | -3,226 | -2,880 |
| Impact on private non-farm employment | -67 | 267 | 466 | 633 | 892 |
| Impact on GDP ($000), real dollars (2012) | -$191,000 | -$155,000 | -$129,000 | -$164,000 | -$128,000 |
| Impact on personal income ($000) | -$204,000 | -$200,000 | -$195,000 | -$255,000 | -$242,000 |

\* assuming the state government spending is cut by the same amount as the research tax credit to balance budget.

**Other unquantified costs and benefits:**

Besides the additional costs and benefits quantified in the previous sections, there are other costs and benefits that are hard to quantify due to lack of data or other challenges. In this section we will enumerate some of these costs and benefits.

Ihlanfeldt and Sjoquist (2001), a published study for the state of Georgia summarizes some of other costs and benefits as follows:

*Loss of competitiveness.* Providing tax credits to selected firms may diminish the competitiveness for existing similar firms.

*Compliance costs.* They think that the costs to the firm may be substantial.

*Improved business climate.* Tax incentive improves the perception of the business climate in the state and is used by site location specialists in screening alternative sites.

*Synergistic or clustering effects.* Tax incentive may attract a firm in an industry new to the state, which then serves as a magnet for attracting additional firms in the industry. Research credit is a great tax incentive for these and other social benefits.

Another hard to quantify cost is the administrative cost. The administrative cost attributable to the research credit should be relatively small because the Department of Revenue administers the credit with existing staff as part of its overall mission.

Another important but hard to quantify benefit for the research tax credit is that it contributes to the technological change and innovation. Technological change is an important factor of long-run productivity growth and increases in living standards.

**Other issues related to costs and benefits**

The burden of a tax does not necessarily fall on those responsible for remitting the tax. It is known through economic theories that corporate taxes change the allocation of capital between corporations and noncorporate businesses and among states because capital would flee from states of higher corporate taxes if all other considerable factors are not significantly different.

Felix (2009) finds that labor bears a significant burden from the state corporate tax in the form of lower wages. Her study further suggests that a one-percentage-point increase in the marginal state corporate tax rate reduces wages by 0.14 to 0.36%, that labor’s burden from the state corporate tax has trended upward over time due to increased global competition and increased competition among states to attract businesses, and that state corporate taxes reduce the wages of highly educated workers more than that of less-educated workers.

The research credit is a highly significant tax incentive that contributes to lower effective corporate and business tax rates. Hence, the findings in Felix (2009) imply that the research credit may have benefited workers who were employed by corporations receiving the credit in the form of higher wages, and also may have benefited the shareholders and clients of those corporations due to the growth of businesses.

1. See the section of “Introduction” for one such limitation: the amount of research credit that can be used in a taxable year is limited to 100 percent of a corporation's first $25,000 of excise, plus 75 percent of the corporation's excise in excess of $25,000. [↑](#footnote-ref-1)
2. Tables 3-5 show that there were 3,440 *claimants* for the credit in 2017, which is slightly lower than the 3,628 *claims* reported in Table 2. There are two reasons for this difference. First, for combined reporting corporate tax filers, the data sets for credits include only the parent corporation’s identification number. So, we were not able to match with other data sets that include information on employees, NAICS codes, etc. at the subsidiary company level. Second, there were rare cases in which a claimant had more than one claim. For example, some taxpayers within a combined group may have taken part of the available credit and shared the remainder with other members (all claims are counted under the name of the parent corporation). [↑](#footnote-ref-2)
3. Regional Economic Models Inc. is a recognized leader in economic analysis at the state level. See their website for background information and further details <https://www.remi.com/> [↑](#footnote-ref-3)
4. Including both tax and non-tax revenues but excluding the revenue loss reported in Table 1. [↑](#footnote-ref-4)
5. Spending on a specific tax incentive means less spending on other expenditure items for the Commonwealth under balanced budget requirement if there is no increase in state revenues. Reduced spending on other expenditure items means forgone benefits from those items. This is an opportunity cost to the Commonwealth, which, more specifically, is borne by the Massachusetts residents or businesses who benefit from those expenditure items. [↑](#footnote-ref-5)
6. For an illustration of “Multiplier Effect”, see Slide 4 of: <https://www.ilw.com/seminars/JohnNeillCitation.pdf> [↑](#footnote-ref-6)