

EVALUATION OF THE RESEARCH AND DEVELOPMENT TAX CREDIT



DEPARTMENT OF LEGISLATIVE SERVICES 2024

Evaluation of the Research and Development Tax Credit

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DEPARTMENT OF LEGISLATIVE SERVICES
OFFICE OF POLICY ANALYSIS
MARYLAND GENERAL ASSEMBLY

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December 2024

The Honorable William C. Ferguson IV, President of the Senate
The Honorable Adrienne A. Jones, Speaker of the House of Delegates
Members of the General Assembly

President Ferguson, Speaker Jones, and Members:

The Tax Expenditure Evaluation Act (formerly the Tax Credit Evaluation Act) establishes a process for evaluating certain tax credits, exemptions, and preferences. The Department of Legislative Services (DLS) is required to evaluate a tax credit, exemption, or preference on a number of factors, including (1) the purpose for which the tax credit, exemption, or preference was established; (2) whether the original intent of the tax credit, exemption, or preference is still appropriate; (3) whether the tax credit, exemption, or preference is meeting its objectives; (4) whether the goals of the tax credit, exemption, or preference could be more effectively carried out by other means; and (5) the cost of the tax credit, exemption, or preference to the State and local governments. Under the former Tax Credit Evaluation Act, the research and development (R&D) tax credit program was reviewed in 2018. DLS must reevaluate the program in 2024 in accordance with a schedule published as required under the Tax Expenditure Evaluation Act.

DLS has conducted its evaluation of the program and makes several findings and recommendations about the program. The document is divided into seven chapters.

- **Chapter 1** provides an overview of the R&D tax credit.
- **Chapter 2** provides a discussion of the tax credit's objectives and goals.
- **Chapter 3** provides information on the federal R&D tax credit and other states' R&D tax credit programs.

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- **Chapter 4** provides information on the tax credit's fiscal impact.
- **Chapter 5** discusses R&D activity in Maryland.
- **Chapter 6** summarizes the findings of the report.
- **Chapter 7** summarizes the recommendations of the report.

We wish to acknowledge the cooperation and assistance provided by the Department of Commerce and the Comptroller's Office. DLS trusts that this report will be useful to members of the General Assembly in future deliberations about the R&D tax credit program.

Sincerely,



Victoria L. Gruber
Executive Director



Ryan Bishop
Director

VLG:RB/GHB/bao

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Executive Summary

Since the mid-1990s, the number of State business tax credits has grown significantly as have related concerns about the actual benefits and costs of these credits. In response to concerns about the fiscal impact of tax credits on State finances, the Tax Expenditure Evaluation Act (formerly the Tax Credit Evaluation Act) establishes a process for evaluating certain tax credits, exemptions, and preferences.

As part of the Tax Expenditure Evaluation Act, the Department of Legislative Services (DLS) is required to evaluate the research and development (R&D) tax credit on a number of factors, including (1) the purpose for which the tax credit was established; (2) whether the original intent of the tax credit is still appropriate; (3) whether the tax credit is meeting its objectives; (4) whether the goals of the tax credit could be more effectively carried out by other means; and (5) the cost of the tax credit to the State and local governments.

Maryland's R&D tax credit was originally enacted under Chapters 515 and 516 of 2000 and has been extended four times – most recently by Chapter 114 of 2021; it is scheduled to terminate June 30, 2027. Prior to Chapter 114, the program offered, subject to annual aggregate funding limits, (1) a basic credit equal to 3% of Maryland qualified R&D expenses paid or incurred during the tax year, up to the Maryland base amount and (2) a growth credit equal to 10% of Maryland qualified R&D expenses paid or incurred during the tax year that exceed the Maryland base amount. Since the tax credit's inception,

annual aggregate funding for the program has doubled – from \$6.0 million to \$12.0 million for tax years after 2015.

DLS previously evaluated the tax credit during the 2017 interim and issued its report in 2018. DLS concluded that there was no evidence of the tax credit's effectiveness and recommended that the General Assembly consider terminating the tax credit and explore other options to increase innovation in the State. However, DLS also made a number of recommendations to improve the tax credit should the General Assembly choose to continue the program. Among other things, DLS recommended that the General Assembly clearly define the program's intent in statute and consider eliminating the basic credit, prioritizing eligibility for new and emerging companies, and setting aside a portion of annual program funding for credits to small businesses.

Chapter 114 subsequently extended the R&D tax credit program through tax year 2025 and made various alterations to the program that took effect beginning with tax year 2020. Consistent with some of the aforementioned DLS recommendations, the Act (1) repealed the basic credit and increased annual aggregate funding for the growth credit from \$6.5 million to \$12.0 million; (2) set aside \$3.5 million annually for refundable credits to small businesses; and (3) stated that the program's purpose is to foster increased research activities and expenditures in Maryland.

In this report, DLS finds that (1) recent legislative changes to the program have contributed to increased industry diversity

among program participants and reduced the concentration of tax credit awards among large firms; (2) carryforwards and other program factors continue to limit the value of the incentive, and refundable small business credits appear to be underutilized; and (3) while legislative changes have mitigated the effects of program oversubscription, businesses receive unequal credit rates as an unintentional consequence of certain administrative procedures.

DLS concludes that, while insufficient data is available to analyze the impact of recent program changes on statewide R&D activity, the newly redesigned program is unlikely to meaningfully impact statewide R&D activity. Annual program awards reflect a very small percentage of overall R&D spending in Maryland, and other features of the program's design and administration limit the tax credit's potential incentivizing effect. Further, it is unclear that increased program funding would improve the program's potential effectiveness.

DLS recommends that the General Assembly consider terminating the R&D tax credit and instead explore other options to increase R&D activity in the State such as providing State matching funds for federal Small Business Innovation Research grant awards or providing grants aimed at increasing human capital in science and technology fields.

However, should the General Assembly choose to continue the tax credit program, DLS makes the following recommendations to improve the program.

- **The General Assembly should further define the goals and intent of the program in statute.**
- **The Department of Commerce (Commerce) should ensure that all eligible program participants receive a uniform credit rate by applying the \$250,000 per-taxpayer cap prior to calculating the proration factor.**
- **The Comptroller should update program regulations to reflect the current statute.**
- **The General Assembly should require the Comptroller's Office to track and specify the treatment of credit carry forwards.**
- **Commerce and the Comptroller's Office should identify and comment on why refundable small business credits are potentially being underutilized.**

Chapter 1. Overview and Background of the Research and Development Tax Credit

Overview

Since the mid-1990s, the number of State business tax credits has grown significantly, as have related concerns about the actual benefits and costs of many of these credits. Prior to 1995, there was 1 tax credit for individuals (earned income) and 2 primarily business tax credits (enterprise zone and Maryland-mined coal credits). Since 1995, at least 40 tax credits primarily for businesses and at least 20 tax credits primarily for individuals have been established. This includes temporary and expired tax credits.

According to the Department of Budget and Management's (DBM) tax expenditure reports, the fiscal impact of individual income tax credits has increased from an estimated \$140.5 million in fiscal 2003 to about \$350 million in fiscal 2022.

Although the reduction in State revenues from tax credits is generally incorporated in the State budget, many tax credits are not subject to an annual appropriation as required for other State programs. However, most of the larger business credits are subject to an aggregate annual limitation that limits fiscal uncertainty. This limitation is typically either an annual budget appropriation, such as under the historic revitalization and biotechnology incentive investment tax credits, or a limitation on the maximum annual amount of credits that can be awarded, such as under the research and development (R&D), film production activity, and job creation tax credits.

Most of these limitations became a component of business tax credits after a significant and unexpected increase in the fiscal cost of the Heritage Structure Rehabilitation Tax Credit Program (since renamed as the historic revitalization tax credit). Of the major business tax credits, only the One Maryland tax credit is not subject to an aggregate annual limitation or annual budget appropriation. The American Institute of Certified Public Accountants lists appropriate government revenues as one of the guiding principles of good tax policy, stating the need to have appropriate levels of predictability, stability, and reliability in a tax system. Improving fiscal certainty can be achieved through annual program limits.

Tax Expenditure Evaluation Act

In response to concerns about the impacts of certain tax credits, Chapters 568 and 569 of 2012 established the Tax Credit Evaluation Act, a legislative process for evaluating certain tax credits. The evaluation process was conducted by a legislative evaluation committee and done in consultation with the Comptroller of Maryland, DBM, the Department of Legislative Services (DLS), and the agency that administered each tax credit. The committee reviewed the following credits: enterprise zone; One Maryland; earned income; film production activity; sustainable

communities (historic revitalization); businesses that create new jobs; job creation; R&D; biotechnology investment incentive; and Regional Institution Strategic Enterprise Zone Program.

Chapter 575 of 2021 expanded the scope of the Tax Credit Evaluation Act, renaming it to the Tax Expenditure Evaluation Act, and eliminated the evaluation committee. Under the Tax Expenditure Evaluation Act, DLS must evaluate tax credits, exemptions, or preferences on request from the Senate Budget and Taxation Committee, the House Ways and Means Committee, the Executive Director of DLS, or the Director of the Office of Policy Analysis of DLS. In addition, beginning October 1, 2022, DLS must (1) evaluate at least once every 10 years each income tax credit that is primarily claimed by businesses and has an annual fiscal impact exceeding \$5.0 million and (2) in consultation with the Senate Budget and Taxation Committee and the House Ways and Means Committee, publish on its website a schedule of the evaluations that will be conducted. In December 2022, DLS published its evaluation of the More Jobs for Marylanders Program income and sales tax credits and its reevaluation of the One Maryland and enterprise zone tax credits. In December 2023, DLS published its evaluation of the innovation investment incentive and purchase of cybersecurity technology or service tax credits. As previously indicated, under the former Tax Credit Evaluation Act, the R&D tax credit program was reviewed in 2018. DLS must reevaluate the program in 2024 in accordance with a schedule published as required under the Tax Expenditure Evaluation Act. This report is a reevaluation of the 2018 evaluation report published by DLS.

Under the Tax Expenditure Evaluation Act, DLS is required to evaluate the tax credit, exemption, or preference on a number of factors, including (1) the purpose for which the tax credit, exemption, or preference was established; (2) whether the original intent of the tax credit, exemption, or preference is still appropriate; (3) whether the tax credit, exemption, or preference is meeting its objectives; (4) whether the goals of the tax credit, exemption, or preference could be more effectively carried out by other means; and (5) the cost of the tax credit, exemption, or preference to the State and local governments.

Research and Development Tax Credit Program

Chapters 515 and 516 of 2000 established the State R&D tax credit program. The stated purpose of the program is to foster increased research activities and expenditures in Maryland.

Eligibility

To qualify for the R&D tax credit, a taxpayer must have qualified research expenses, as defined in § 41 of the Internal Revenue Code (IRC), incurred for qualified research that is conducted in the State. Qualified research expenses include in-house research expenses (wages for qualified services, supplies used in the conduct of qualified research, and rental or lease costs of computers used in qualified research) and certain contract research expenses paid or incurred by the taxpayer in carrying on any trade or business of the taxpayer. Qualified research is research (1) for which expenses qualify as amortizable research or experimental expenditures under § 174

of the IRC; (2) that is undertaken for the purpose of discovering information that is technological in nature, the application of which is intended for use in developing a new or improved business component of the taxpayer; and (3) substantially all of the activities of which constitute elements of a process of experimentation relating to a new or improved function, performance, or reliability or quality.

Credit Value and Funding

The R&D tax credit is equal to 10% of the amount of Maryland qualified R&D expenses paid or incurred during the taxable year that exceed the Maryland base amount, subject to an annual \$250,000 per taxpayer cap and certain annual aggregate caps, as discussed further. The Maryland base amount is the product of the average annual Maryland gross receipts of the business for the four preceding tax years and the Maryland base percentage; the Maryland base percentage is equal to the percentage that the Maryland qualified R&D expenses for the four preceding taxable years (or, for a taxpayer with fewer than four but at least one prior taxable year, the number of immediately preceding taxable years that the taxpayer has) is of Maryland gross receipts for those years.

In general, the tax credit is nonrefundable – the credit may be used only to offset income tax. Any unused amount of credit may be carried forward for up to seven years after the taxable year in which the expense was incurred. However, the tax credit is fully refundable for a small business, which is defined as a for-profit corporation, limited liability company, partnership, or sole proprietorship with net book value assets totaling less than \$5 million at the beginning or end of the taxable year for which Maryland qualified R&D expenses are incurred.

Maryland conforms to the federal deduction for research and experimental expenditures. Thus, the State credit is considered taxable income for Maryland income tax purposes; a taxpayer must add back to income the amount of any State credit claimed.

The Department of Commerce (Commerce) administers the tax credit application, approval, and certification process and annually reports to the Governor and the General Assembly on program activity. Commerce may approve up to \$12.0 million in tax credits annually, of which \$3.5 million is set aside for small businesses. If the total amount of credits applied for by small businesses exceeds \$3.5 million, the amount approved for each small business applicant is reduced by a proportional amount of the excess. Similarly, if the total amount of credits applied for by non-small businesses exceeds \$8.5 million (plus any unused amount of the small business set-aside), the amount approved for each non-small business applicant is reduced by a proportional amount of the excess.

The program terminates June 30, 2027.

Application Process and Claiming the Credit

To apply for the credit, a business must submit an application to Commerce by November 15 of the calendar year following the end of the tax year for which the Maryland qualified research expenses were incurred. The application includes certain taxpayer information and information necessary to calculate the amount of the credit. Commerce reviews and processes applications and must certify approved tax credits by the following February 15. To claim an approved credit, a taxpayer must (1) file an amended income tax return for the taxable year in which the Maryland qualified R&D expense was incurred and attach a copy of the tax credit certification to the amended income tax return or (2) attach a copy of the tax credit certification to an income tax return filed for any of the seven taxable years after the taxable year in which the Maryland qualified R&D expenses were incurred.

Legislative Changes

As previously indicated, Chapters 515 and 516 established the R&D tax credit program as a credit against the State income tax for individuals and corporations that incur qualified R&D expenses in Maryland. As originally enacted, the program offered (1) a basic credit equal to 3% of the Maryland qualified R&D expenses paid during the tax year, up to the Maryland base amount and (2) a growth credit equal to 10% of the Maryland qualified R&D expenses paid during the year that exceed the Maryland base amount. The basic and growth credits were each subject to an annual aggregate cap of \$3.0 million. Chapter 152 of 2001 authorized any unused portion of either the basic credit or the growth credit to be issued for the other credit if that credit had reached its maximum.

Chapter 98 of 2005 extended the tax credit program through tax year 2010 and established annual reporting requirements for Commerce. Chapter 98 also reduced the length of time, from 15 years to 7 years, that unused credits may be carried forward.

Chapter 90 of 2007 clarified that the State R&D tax credit program is decoupled from any repeal of the federal research and experimentation tax credit.

Chapter 20 of 2010 extended the termination date of the tax credit program to June 30, 2021.

Chapter 109 of 2013 increased the aggregate amount of credits that may be approved each year from \$6 million to \$8 million. In addition, Chapter 109 made the credit refundable for certain small businesses.

Chapter 525 of 2014 increased the aggregate amount of credits that may be approved each year from \$8 million to \$9 million.

Chapter 743 of 2017 increased the aggregate amount of credits that may be approved each year from \$9 million to \$12 million.

Chapter 609 of 2018 extended by two months the deadlines by which (1) an individual or corporation must submit an application for the R&D credit and (2) Commerce must certify R&D tax credits. Chapter 609 also authorized a taxpayer to claim the credit by attaching a copy of the tax credit certification to an income tax return filed for any of the seven taxable years after the taxable year in which the Maryland qualified R&D expenses were incurred.

Chapter 85 of 2019 extended the termination date of the tax credit program to June 30, 2022.

Finally, Chapter 114 of 2021 significantly altered the tax credit program by (1) eliminating the basic credit; (2) increasing to \$12 million the amount of growth tax credits that may be awarded annually, \$3.5 million of which Commerce must set aside for credits to small businesses; (3) limiting the value of the tax credit to \$250,000; (4) defining net book assets for purposes of determining small business eligibility; (5) establishing the purpose of the program; and (6) extending the termination date of the program to June 30, 2027.

Overview of the 2018 Research and Development Tax Credit Evaluation

In an effort to better understand the fiscal impacts and effectiveness of the R&D credit, the 2018 *Evaluation of the Research and Development Tax Credit* report provided an overview of the R&D tax credit program, credit implementation and process issues, and the impact of the credit on innovation.

Issues highlighted in the report included the following.

- **Basic Credit Provided Windfalls:** The basic tax credit provided tax credits for a business's total recent R&D expenditures rather than incremental increases, so it was much more likely to provide windfall credits for R&D activities that would have otherwise occurred in the absence of the tax credit. Incremental credits are preferred for incentivizing growth.
- **Oversubscription Reduced Credit Value:** In every year examined by the report, the total amount of credits for which businesses were eligible had substantially exceeded the aggregate annual limit; the amount approved for each credit was reduced by a proportional amount of the excess. As a result of this reduction in the value of the credit, the credit provided a limited direct incentive for companies to increase R&D expenditures.
- **Large Businesses Earned Most Credits:** The concentration of R&D tax credit claims within a few, large, multistate companies was greater than in other tax credit programs that had been evaluated by DLS. Small businesses only received about 2% of the total credits awarded in tax years 2012 through 2015.

- ***Legislative Intent of the Credit Was Undefined:*** Chapters 515 and 516 established the R&D tax credit but did not specify a specific goal or intent for the credit, making it difficult to evaluate the credit's effectiveness.

In light of these findings, DLS made several recommendations as to how the effectiveness of the R&D tax credits might be improved. These recommendations included the following statutory changes – some of which, as indicated previously, were ultimately adopted under Chapter 114:

- eliminate the basic credit;
- prioritize eligibility for new, emerging, and small companies;
- set aside a portion of the tax credits to be allocated for R&D expenditures by small businesses; and
- clearly define the intent of the R&D tax credit program.

Chapter 2. Intent and Objectives of the Research and Development Tax Credit

Intent of the Research and Development Tax Credit

Prior to the enactment of Chapter 114 of 2021, neither statute nor regulation specified the intent or objectives of the research and development (R&D) tax credit, as highlighted in the Department of Legislative Services' (DLS) 2018 *Evaluation of the Research and Development Tax Credit*. Consistent with DLS's recommendation that the General Assembly define the program's intent in statute, Chapter 114 stated that the purpose of the program is to foster increased research activities and expenditures in Maryland. The stated purpose is consistent with the broader programmatic changes enacted under the Act, which remodeled the State's R&D credit as an incremental credit only. The stated purpose is also aligned with the intent of the federal research tax credit, which is designed to encourage firms to increase investment in research.

Rationale for and Effectiveness of Research and Development Tax Incentives

The traditional rationale for government intervention in R&D is that, absent such intervention, a market economy is likely to underinvest in research with large spillover benefits that are not easily captured by the investing firms. There is a general consensus among economists that technological innovation is the primary driver of long-term economic growth¹; however, R&D – which enables innovation – resembles a public good. As the Congressional Research Service notes, research suggests that firms do not fully capture all of the returns on R&D investments despite intellectual property protections.² In a 2019 paper, researchers found that the social return to R&D exceeds the private return to R&D by a factor of about four.³

The federal tax code seeks to increase business R&D investment closer to the socially optimal amount by reducing the after-tax cost of R&D via the research tax credit and, prior to 2022, expensing of qualified research expenses. Research suggests that the federal credit is effective in stimulating increased business R&D investment. In a review of the pre-2000 literature on the effectiveness of the federal research tax credit, researchers found that one dollar of federal research tax credit generates roughly one additional dollar in reported R&D spending.⁴ However, they cautioned that the surveyed estimates may overstate the credit's actual effect on R&D spending to the extent that firms relabeled expenses as qualified expenses in response to the

¹ Gary Guenther, *Federal Research Tax Credit: Current Law and Policy Issues*, Congressional Research Service Report No. RL31181 (Congressional Research Service, 2022), 1.

² *Ibid*, 2.

³ Brian Lucking et al., "Have R&D Spillovers Declined in the 21st Century?" *Fiscal Studies* 40, no. 4 (2019): 561-590.

⁴ Bronwyn Hall and John Van Reenen, "How Effective are Fiscal Incentives for R&D? A Review of the Evidence," *Research Policy* 29 (2000): 449-469.

introduction of the credit, as some evidence suggests.⁵ A more recent study found that the average firm will respond to a 10% reduction in the user cost of R&D by increasing its research intensity (the ratio of R&D spending to sales) by 19.8% in the short run; the study also found that firms largely respond to user cost changes by increasing qualified spending as opposed to total R&D spending.⁶

As noted in DLS's 2018 evaluation report, there is less consensus surrounding the justification for state R&D tax credits. The broader efficiency goal of the federal credit does not clearly explain the existence of state-level R&D credits. The spillover benefits resulting from business R&D activities that take place within a given state are unlikely to be confined within that state; however, research does provide evidence of localized knowledge spillovers.⁷ Other possible objectives for state R&D tax credits include attracting high-wage jobs with high multiplier effects on in-state economies, encouraging businesses to locate within a state, and conformance with the federal tax law.⁸ Notably, a 2009 study found that state R&D credits are effective in shifting R&D spending among states but have little effect on total R&D spending across states, "suggesting a zero-sum game among states."⁹

In 2018, DLS found that the existing literature on state R&D tax credits presented mixed conclusions on the effectiveness of such credits. A review of the subsequent literature does not offer any clearer consensus regarding the effectiveness of state credits:

- A 2018 paper, which analyzed variation in state R&D tax incentive rates driven by changes in federal tax law, found that a 1% increase in R&D tax incentives generates a 2.8% to 3.8% increase in R&D expenditures.¹⁰ The paper did not draw a conclusion as to whether the elasticity estimates could be explained by firms shifting R&D between establishments in response to state tax incentives or increasing total R&D in response to incentives.
- A 2019 working paper found that state R&D tax credits are associated with significant long-term impact on the overall quantity and quality-adjusted quantity of entrepreneurship, with most of the effect materializing more than five years after the policy is enacted.¹¹ The

⁵ Ibid, 463.

⁶ Nirupama Rao, "Do Tax Credits Stimulate R&D Spending? The Effect of the R&D Tax Credit in its First Decade," *Journal of Public Economics* 140 (2016): 1-12.

⁷ For example, see Adam B. Jaffe et al., "Geographic Localization of Knowledge Spillovers as Evidenced by Patent Citations," *The Quarterly Journal of Economics*, 108, no. 3 (1993): 577-598, and, more recently, Kristy Buzard et al., "Localized Knowledge Spillovers: Evidence from the Spatial Clustering of R&D Labs and Patent Citations," *Regional Science and Urban Economics*, 81 (2020): 103490.

⁸ See *An Overview of California's Research and Development Tax Credit* (California Legislative Analyst's Office, 2003), as well as Bronwyn H. Hall and Marta Wosinska, *Effectiveness of the California R&D Tax Credit* (1999), 1-2, which articulate various rationales for the California R&D tax credit.

⁹ Daniel J. Wilson, "Beggar Thy Neighbor? The In-State, Out-of-State, and Aggregate Effects of R&D Tax Credits," *The Review of Economics and Statistics*, 91, no. 2 (2009): 431-436.

¹⁰ Andrew C. Chang, "Tax Policy Endogeneity: Evidence from R&D Tax Credits," *Economics of Innovation and New Technology*, 27, no. 8 (2018): 809-833.

¹¹ Fazio et al., "The Impact of State-Level R&D Tax Credits on the Quantity and Quality of Entrepreneurship," NBER Working Paper No. 26099 (National Bureau of Economic Research, 2019).

authors further note that R&D tax credits do not offer a “quick fix” for states seeking to stimulate regional economic growth through entrepreneurship, and that it may take a decade or more for such policies to have an impact on the economy through entrepreneurship.

- A 2020 evaluation of Pennsylvania’s R&D tax credit did not find evidence of the credit’s effectiveness using statewide jobs or R&D expenditure data.¹²
- A 2021 evaluation of Iowa’s research activities tax credit – which analyzed data on incremental research activities tax credit programs and research inputs (private R&D expenditures and private employment) and outputs (utility patents and private gross state product activity) for all 50 states – found that state research activities credits are not associated with significantly more research inputs and outputs; rather, states that offer such credits tend to have other factors that drive research inputs and outputs.¹³
- A 2022 report of the Virginia Joint Legislative Audit and Review Commission on the state’s science and technology incentives concluded that, while Virginia’s R&D tax credits likely have increased R&D expenditures and activity for many of the companies using them, the incentives are too small to meaningfully increase statewide business R&D activity.¹⁴ The report notes that even significant increases in funding for the tax credits would likely not have a meaningful impact on the state’s business R&D activity.

¹² *Pennsylvania Research and Development Tax Credit* (Pennsylvania Independent Fiscal Office, 2020).

¹³ Cody J. Schmidt, *Research Activities Tax Credit Tax Credits Program Evaluation Study* (Iowa Department of Revenue, 2021).

¹⁴ *Science and Technology Incentives* (Virginia Joint Legislative Audit and Review Commission, 2022).

Chapter 3. Research and Development Tax Credit Programs

Federal Research Tax Credit

The federal research tax credit (Internal Revenue Code (IRC) § 41), which was originally enacted in 1981 and made permanent by the Protecting Americans from Tax Hikes Act of 2015, is one of the largest federal business tax expenditures. The Joint Committee on Taxation estimates that federal tax expenditures associated with the research tax credit will total \$118.0 billion over federal fiscal 2023 through 2027.

In general, the federal research tax credit offers a credit for qualified research expenses (QRE) that exceed a base amount designed to approximate qualified research spending in the absence of the tax credit. (In addition to the credit for increasing QREs, the federal research tax credit includes separate credit components for certain basic research payments to qualified organizations and certain amounts paid or incurred to energy research consortia.)

Qualified research, as it applies to the federal research tax credit, means research:

- for which expenses qualify as amortizable research or experimental expenditures under § 174 of the IRC;
- that is undertaken to discover information that is technological in nature, the application of which is intended for use in the development of a new or improved business component of the taxpayer; and
- including substantially all of the activities that constitute elements of a process of experimentation relating to a new or improved function, performance, reliability, or quality.

QREs include both in-house research expenses and contract research expenses. In-house research expenses include wages for qualified services, supplies used in the conduct of qualified research, and rental or lease costs of computers used in qualified research. Contract research expenses include 100% of amounts paid or incurred by the taxpayer for qualified energy research performed by certain small firms, colleges and universities, and federal laboratories; 75% of amounts paid or incurred by the taxpayer for qualified research performed by qualified research consortia; and 65% of amounts paid or incurred by the taxpayer for qualified research performed by any other person (other than an employee of the taxpayer). Wages for qualified services account for the majority of QREs – according to data published by the Internal Revenue Service (IRS), in tax year 2014 (the most recent for which data is available), wages for qualified services accounted for approximately 70% of QREs reported on corporate tax returns, followed by supplies (15%), contract research expenses (15%), and rental or lease costs of computers (less than 1%).

Taxpayers may choose one of two methods to calculate the credit:

- **Regular Credit:** The regular credit equals 20% of the amount of current-year QREs that exceed the base amount, which is equal to the average annual gross receipts of the taxpayer for the four preceding tax years multiplied by the “fixed-base percentage.” The fixed-based percentage is generally calculated by dividing aggregate QREs for a specified period (determined based on whether the business is an existing company or a start-up company) by aggregate gross receipts for the same period. The base amount may not be less than 50% of the taxpayer’s current-year QREs.
- **Alternative Simplified Credit (ASC):** The ASC equals 14% of QREs that exceed 50% of the average QREs for the three preceding tax years. For a taxpayer who has no QREs in any of the three preceding tax years, the credit is equal to 6% of current-year QREs. The election to use the ASC method is effective for succeeding tax years unless revoked with the consent of IRS.

According to data published by IRS, in tax year 2014 (the most recent year in which data is available), corporations that claimed the ASC reported \$154.3 billion in total QREs – more than twice the amount of total QREs reported by corporations that claimed the regular credit (\$72.3 billion).

Prior to tax year 2022, specified research and experimental expenditures were eligible for expensing under § 174 of the IRC. The federal Tax Cuts and Jobs Act of 2017 disallowed expensing of specified research and experimental expenditures for tax years after 2021; instead, taxpayers may amortize such expenditures ratably over a 5-year period (15-year period in the case of specified research and experimental expenditures attributable to foreign research) beginning with the midpoint of the tax year in which the expenditures are paid or incurred. Section 280C of the IRC prevents taxpayers from deducting research expenses for which the research tax credit is claimed by requiring taxpayers to (1) reduce the amount chargeable to a capital account for the tax year for QREs or basic research expenses, as specified or (2) elect to take a reduced credit, as specified. The Congressional Research Service notes that most corporations claiming the research tax credit elect to take the reduced credit; in tax year 2014, more than 90% of corporations elected the reduced credit.

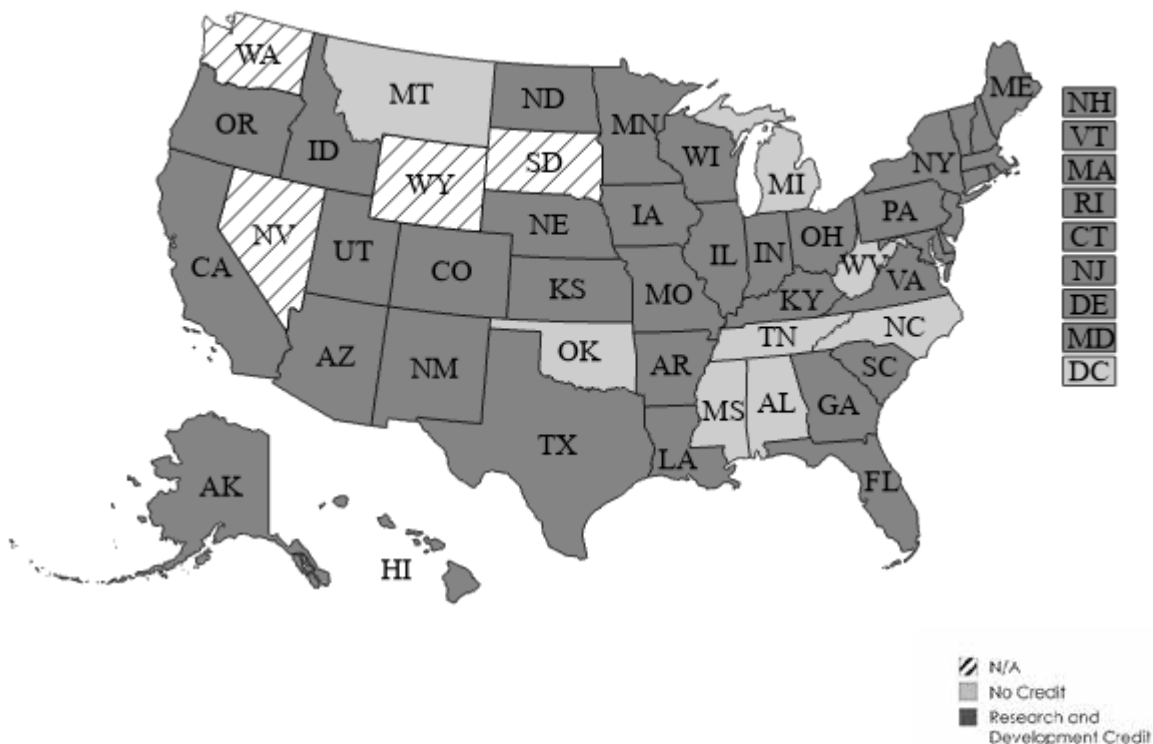
The federal research tax credit is a component of the general business credit and is subject to the rules and limitations of the general business credit. Thus, the credit is nonrefundable, and unused credits may be carried back 1 tax year or forward up to 20 tax years. A qualified small business may elect to claim up to \$500,000 (\$250,000 for tax years beginning before January 1, 2023) as a credit against the employer payroll tax and may apply the tax credit against the alternative minimum tax. “Qualified small business,” as it applies to the payroll tax credit election of the federal research tax credit, is defined as (1) a corporation or partnership with gross receipts of less than \$5.0 million for the tax year and no gross receipts for any tax year preceding the 5-year period ending with the tax year and (2) any person other than a corporation or partnership who meets the aforementioned requirements if taking into account aggregate gross

receipts from all of the person's trades or businesses. (In contrast, the Maryland research and development (R&D) tax credit defines small businesses based on net book value assets.)

Research and Development Tax Credits in Other States

In 1981, Minnesota was the first state to enact an income tax credit that was similar to the federal research tax credit. There are now 38 states that offer a business income tax credit, as shown in **Exhibit 3.1**.

Exhibit 3.1
States Research and Development Tax Credits
Calendar 2024



Note: N/A means the state does not tax general business corporations or pass-through income.

Source: CCH Intelliconnect; Department of Legislative Services

Most states calculate the credit based on the incremental growth in eligible research expenditures, with the typical credit percentage ranging between 5% and 10%. The tax credit in three states (Nebraska, New York, and Vermont) is equal to a percentage of the federal credit, and in Delaware, companies have the option of using the federal credit as a base.

Nine states provide a tax credit that is at least partially refundable. Maryland, along with Arizona, Connecticut, and New Mexico, limits the refundable credit to certain small businesses. Eight states, including Maryland, have a maximum limit on the total amount of credits that can be awarded in each year. In 2024, this limit ranged from \$5 million in Hawaii to \$60 million in Pennsylvania. Maryland, Missouri, New Hampshire, Pennsylvania, and Virginia prorate the credit if the program is oversubscribed, while Arizona, Florida, and Hawaii provide the credit on a first come, first served basis.

Research and Development Credits in Surrounding States

Of Maryland's nearby states, Delaware, Pennsylvania, and Virginia have an active R&D income tax credit. West Virginia previously had a program that terminated in 2013, and North Carolina repealed its program beginning in 2016.

Delaware

Delaware provides a R&D tax credit equal to (1) 10% of the excess of the taxpayer's qualified R&D expenses over the Delaware base amount or (2) 50% of the taxpayer's federal tax credit (under the ASC method) that is apportioned to activity in the state. Prior to 2017, a maximum of \$5 million in credits could be awarded in each year to all companies, and the value of the credit was limited to 50% of the tax liability imposed in the year. Both of these limitations were removed beginning January 1, 2017. In addition, the credit was made fully refundable.

Virginia

The Virginia R&D tax credit is an income tax credit for qualified R&D expenses that were incurred beginning on January 1, 2011, but before January 1, 2025. Program funding is limited to \$15.77 million in each fiscal year. The tax credit is equal to:

- 15% of the first \$300,000 in qualified R&D expenses; or
- 20% of the first \$300,000 of qualified R&D expenses if the research is conducted in conjunction with a Virginia public or private college or university, to the extent that the expenses exceed a base amount.

Virginia taxpayers with more than \$5 million in eligible R&D expenses may also qualify for the major R&D tax credit but may not claim both credits. The major R&D tax credit is equal to 10% of the difference between the qualified R&D expenses paid or incurred by the taxpayer during the taxable year and 50% of the average qualified R&D expenses paid or incurred by the taxpayer for the three preceding taxable years. If the taxpayer did not pay or incur Virginia qualified R&D expenses in any one of the three preceding taxable years, then the tax credit equals 5% of the qualified R&D expenses paid or incurred by the taxpayer during the taxable year. No more than \$16 million in major R&D tax credits can be issued to all companies in each fiscal year.

Pennsylvania

Pennsylvania's R&D credit is equal to 10% of the excess of the taxpayer's qualified R&D expenses over the Pennsylvania base amount. The tax credit was established in 1997, and through 2003, an annual total of \$15 million in credits could be awarded to all companies. Subsequent legislation has expanded the credit, including an increase in the maximum annual credits to \$30 million in 2004, \$55 million beginning in 2011, and \$60 million beginning in 2022. A small business is allowed a credit equal to 20% of the excess of the taxpayer's total qualified R&D expenses for the taxable year over the base amount. A total of \$12 million in credits is reserved for small businesses in each year. Taxpayers may sell or otherwise transfer R&D credits if certain conditions are met.

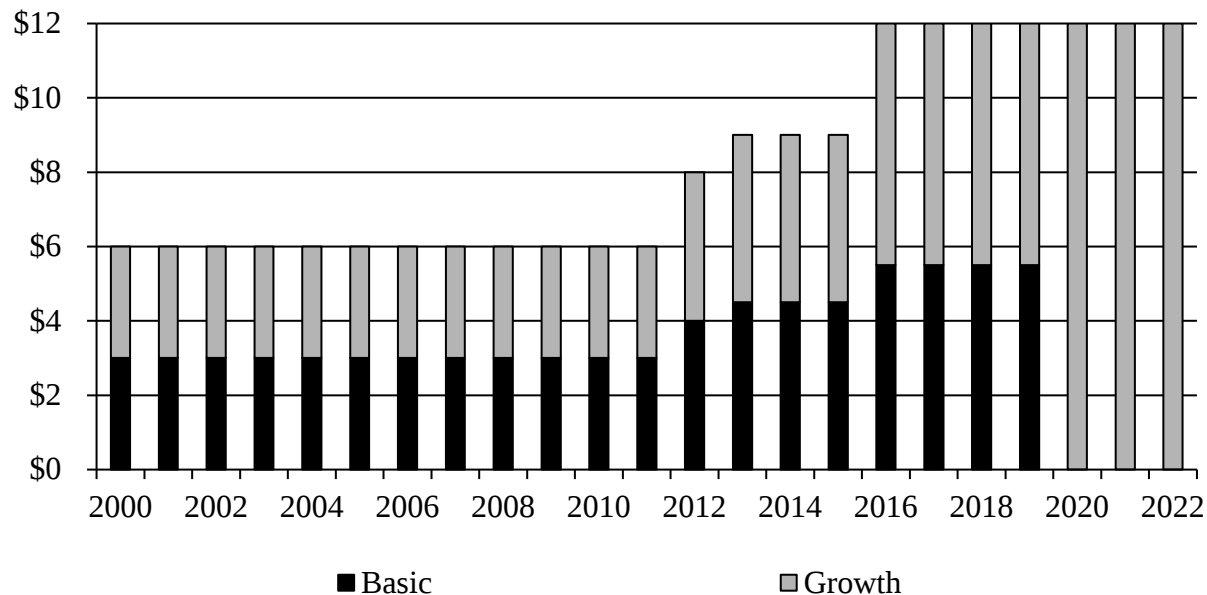
In 2023, a total of 971 companies applied for \$175.1 million in credits, exceeding the \$60.0 million maximum aggregate. Since the credit amount is reduced by the amount of the oversubscription, the credits awarded ultimately equaled 34.3% of the total credit applications. Manufacturing firms, particularly pharmaceutical and medicine manufacturers, are the primary beneficiaries. As of mid-2023, a total of \$156.3 million in unused R&D tax credits have been sold or transferred. This is equal to 92.9% of the value of the unused credits.

Chapter 4. State and Local Costs

State Fiscal Impact

Statute limits the total amount of research and development (R&D) tax credits that the Department of Commerce (Commerce) may award each year. For the first 12 years of the program, annual tax credit awards were capped at \$6.0 million (\$3.0 million in basic credits and \$3.0 million in growth credits). Legislation enacted in 2013, 2014, and 2017 doubled the annual aggregate cap to \$12.0 million by tax year 2016. Chapter 114 of 2021 repealed the basic credit but maintained the annual aggregate cap of \$12.0 million. **Exhibit 4.1** shows the total amount of R&D tax credits authorized in each tax year for which the credit has been available; the program has been fully subscribed in each of tax years 2000 through 2022. Commerce has awarded a total of \$191.0 million in R&D tax credits since the program's enactment.

Exhibit 4.1
Research and Development Credits Authorized
Tax Year 2000-2022
(\$ in Millions)



Source: Department of Legislative Services

Nonrefundability Limits Fiscal Impact

Except for qualifying small businesses, the tax credit is nonrefundable. Businesses that do not qualify for the refundable small business credit often do not have sufficient income tax liability to claim the full value of the tax credit in the first year. Any excess credit may be carried forward for up to 7 tax years (15 years for tax years 2000 to 2004) after the tax year in which the Maryland qualified R&D expense was incurred. Accordingly, the actual annual fiscal impact may be less than the amount of credits awarded by Commerce each year. Due to data limitations surrounding the amount of R&D credit carryforwards each year, the program's precise impact on State revenues is unknown. The Department of Legislative Services' 2018 evaluation report noted that, overall, approximately 40% is claimed in the first tax year with the remaining amounts carried forward to future tax years. The volume of initial refundable claims has increased in recent years in response to the enactment of Chapter 114, which sets aside \$3.5 million annually for refundable credits to small businesses.

Add-back Requirement Further Limits Fiscal Impact

As noted previously, Maryland conforms to the federal deduction for research and experimental expenditures. For Maryland income tax purposes, to prevent a double benefit for the same expenses, a taxpayer must add back to income the amount of any State R&D tax credit claimed. Thus, the effective tax benefit is equal to the amount of the credit reduced by the marginal income tax rate.

Program Administrative Costs

Currently, a program manager and an additional staff person at Commerce devote a portion of their time to administering the credit.

Local Fiscal Impact

Local governments receive a portion of corporate income tax revenues to support the construction and maintenance of local roads and other transportation facilities. Thus, R&D tax credits claimed against the corporate income tax decrease local Highway User Revenues (HUR). Most R&D tax credit dollars are claimed against the corporate income tax, although the amount of credits claimed against the personal income tax has increased in recent years in response to changes enacted under Chapter 114 that increased the amount of credits awarded to small businesses. Based on the average percentage of initial claims against the corporate income tax for tax years 2020 through 2022 and current annual funding of \$12.0 million, local HURs decrease by an estimated \$200,000 to \$300,000 annually. Local income tax revenues increase minimally each year due to the add-back of the credit on personal income tax returns.

Additional Maryland Research and Development Tax Incentives

Sales and Use Tax Exemption

In addition to the State income tax credit for incremental R&D expenses, the State exempts sales of tangible personal property, digital codes, and digital products for use or consumption in R&D from the sales and use tax. For purposes of the exemption, R&D is defined as basic and applied research in the sciences and engineering and the design, development, and governmentally required premarket testing of prototypes, products, and processes. It does not include market research, research in the social sciences or psychology and other nontechnical activities, routine product testing, sales services, or technical and nontechnical services.

The sales and use tax exemption is estimated to have a greater effect on State revenues than the State R&D income tax credit. According to the Department of Budget and Management's *Fiscal Year 2022 Tax Expenditure Report*, tax expenditures associated with the sales and use tax exemption were estimated to total \$27.7 million for fiscal 2022.

Chapter 5. Maryland Research and Development Activity

Maryland Continues to Be One of the Most Research and Development-intensive States

According to data published by the National Science Foundation's (NSF) National Center for Science and Engineering Statistics, in 2021, Maryland research and development (R&D) expenditures totaled \$25.1 billion, or about 3.2% of U.S. R&D expenditures. For context, Maryland accounts for approximately 1.9% of U.S. gross domestic product (GDP). Maryland ranked eighth in the nation in terms of total R&D spending, following behind Michigan (\$25.8 billion), New Jersey (\$27.7 billion), Texas (\$37.3 billion), New York (\$38.2 billion), Massachusetts (\$52.4 billion), Washington (\$54.0 billion), and California (\$236.1 billion). This ranking has dropped slightly since the Department of Legislative Services (DLS) last evaluated the R&D tax credit; as noted in DLS's 2018 *Evaluation of the Research and Development Tax Credit*, in 2014, Maryland R&D expenditures totaled \$20.2 billion, ranking behind only New York, Texas, Massachusetts and California.

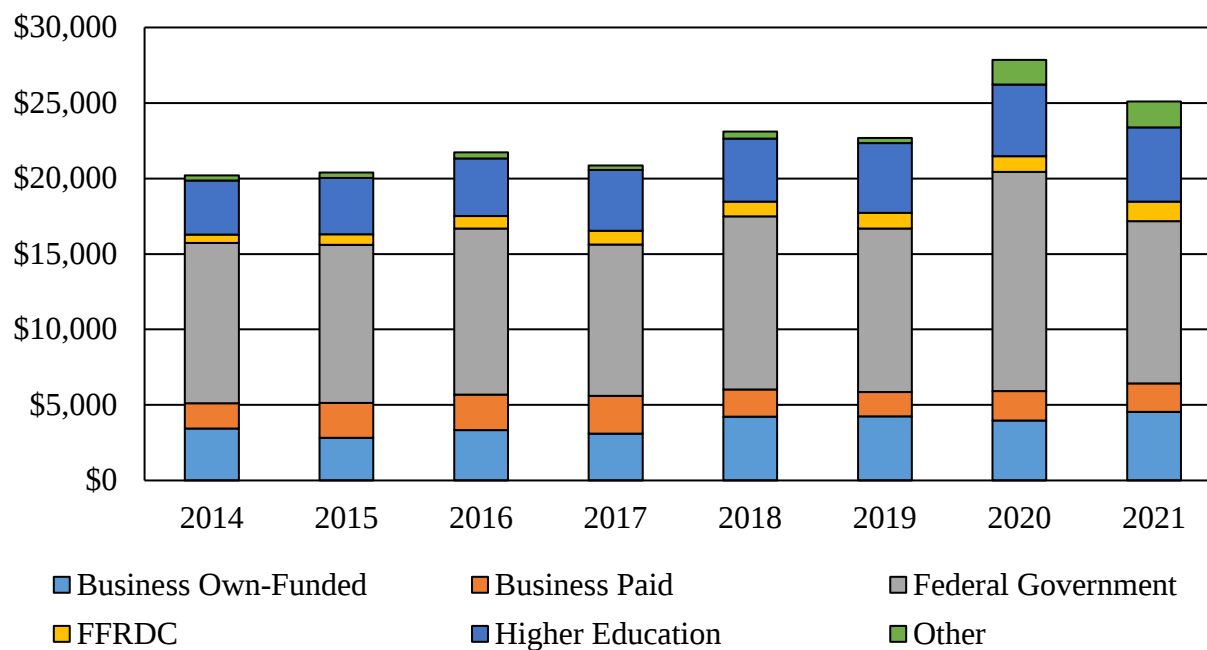
Maryland ranked fifth in the nation in terms of R&D intensity in 2021, with R&D expenditures accounting for 5.6% of gross state product – following behind California (6.9%), Washington (7.8%), Massachusetts (8.1%), and New Mexico (8.7%). This ranking has also dropped slightly since DLS last evaluated the R&D tax credit – from third in 2014 – due to increased R&D intensity in California and Washington. (Maryland's R&D intensity is relatively unchanged, from 5.6% of gross state product in 2014.) Nationally, R&D expenditures accounted for 3.3% of GDP.

Federal Government Continues to Be Largest Performer of Research and Development in Maryland; Maryland Business Research and Development Intensity Continues to Be Relatively Low

R&D is funded and conducted by a variety of entities including businesses, governmental entities, academic institutions, and other nonprofit organizations. NSF classifies R&D expenditures based on the entity conducting or funding R&D as follows: business R&D (own funded); business R&D (paid, meaning paid by other entities like the federal government, foreign companies, and other U.S. companies); higher education; federal government; federally funded research and development centers (FFRDC); and other (like nonprofit organizations). First established in the 1940s, FFRDCs are privately operated R&D organizations that are exclusively or substantially financed by the federal government. There are 43 FFRDCs, of which 4 are located in Maryland. The research centers located in Maryland focus on modernizing health care, biodefense, cybersecurity, and cancer research.

As shown in **Exhibit 6.1**, the federal government continues to be the largest R&D performer in Maryland in terms of R&D expenditures in the State – accounting for about 48% of total Maryland R&D expenditures in 2017 through 2021 (the most recent five-year period for which data is available), compared to about 6% of U.S R&D expenditures. In 2021, federal government R&D expenditures in Maryland totaled \$10.7 billion, or 43% of total Maryland R&D expenditures. Total Maryland R&D expenditures increased by about 23% from 2019 to 2020, largely due to a \$3.7 billion increase in federal government R&D expenditures in Maryland.

Exhibit 6.1
Maryland R&D Spending by Performer
Calendar 2014-2021
(\$ in Millions)



FFRDC: federally funded research and development center
R&D: research and development

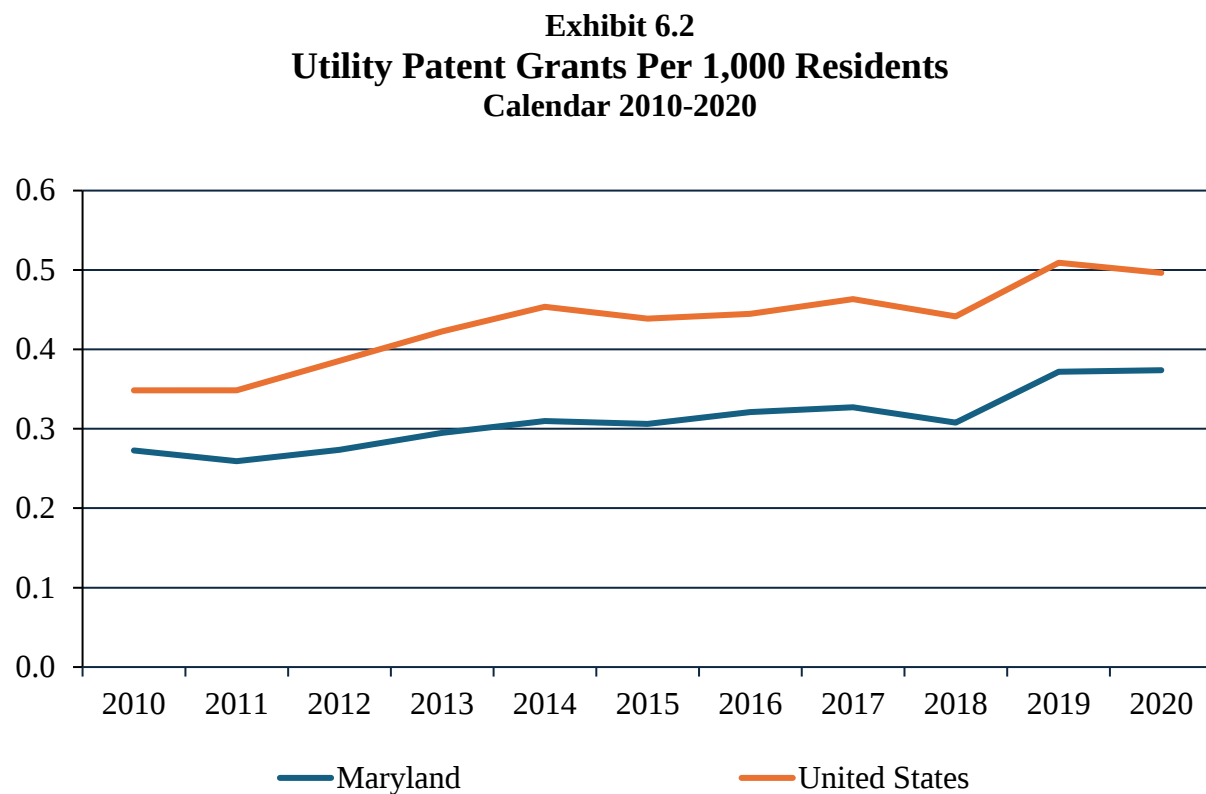
Source: National Science Foundation; Department of Legislative Services

Maryland's business R&D intensity continues to be relatively low compared to other states. Own-funded business R&D expenditures accounted for about 17% of total Maryland R&D spending in 2017 through 2021, compared to about 65% of U.S. R&D expenditures. In 2021, own-funded business R&D expenditures in Maryland totaled \$4.6 billion and were equal to about 1.0% of Maryland gross state product, compared to about 2.3% of U.S. GDP.

Higher education accounted for about 19% of total Maryland R&D expenditures in 2017 through 2021, compared to about 12% of U.S. R&D expenditures. In 2021, higher education R&D expenditures totaled \$4.9 billion.

Maryland Patent Volume Trend Generally Mirrors National Trend

Exhibit 6.2 displays the number of Maryland and U.S. utility patent grants per 1,000 residents in calendar 2010 through 2020 (the most recent year for which data is available). As shown in the exhibit, Maryland generally lags behind the nation in terms of per capita utility patent grants but otherwise mirrors the national trend. For additional information regarding Maryland patent activity, see “Chapter 6. Maryland Research and Development and Innovation” of the 2018 evaluation report.



Source: U.S. Patent and Trademark Office; Department of Legislative Services

Chapter 6. Findings

Insufficient Data Is Available to Analyze the Impact of Recent Program Changes on Statewide Research and Development Activity; However, the Program Is Unlikely to Meaningfully Impact Statewide Research and Development Activity

Given the recency of major legislative changes to the research and development (R&D) tax credit program, insufficient data is available to analyze the effect of the redesigned program on statewide R&D activities and expenditures. As discussed previously, the Department of Legislative Services' (DLS) 2018 *Evaluation of the Research and Development Tax Credit* found no evidence that the tax credit was effective and recommended that the General Assembly, should it choose to continue the program, eliminate the basic credit and set aside a portion of program funding for small business credits, among other things. Chapter 114 of 2021 subsequently repealed the basic credit and increased annual growth credit funding from \$6.5 million to \$12.0 million; limited the value of the tax credit to \$250,000; and set aside \$3.5 million annually for credits to qualifying small businesses. The Act applied to tax years after 2019 – thus, while there is three years' worth of data on program activity following the enactment of Chapter 114, the first year (tax year 2020) reflects R&D spending that occurred prior to the enactment of Chapter 114, and only the most recent year of program data (tax year 2022) reflects a full year of R&D spending under the current incentive. It is also worth noting that, notwithstanding present data limitations, it is particularly challenging to distinguish the effect of the tax credit from the effects of other various factors that influence private R&D activity.

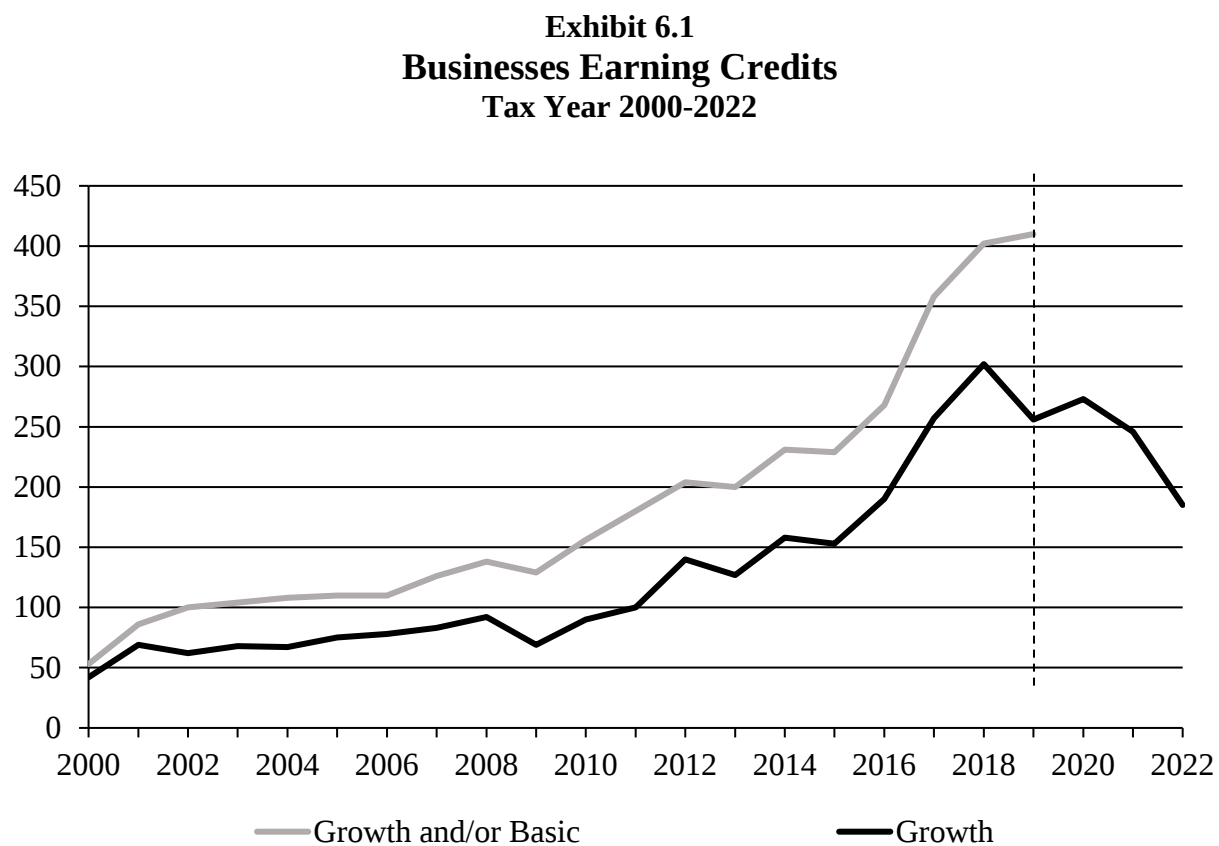
Nonetheless, similar to the conclusion drawn by the Virginia Joint Legislative Audit and Review Commission with regard to Virginia's R&D tax credits, DLS advises that Maryland's R&D tax credit program is unlikely to have a meaningful impact on statewide R&D spending and activity. Annual program awards reflect a very small percentage of overall R&D spending in Maryland – for 2021, total tax credit awards were equal to 0.26% of business own-funded R&D spending in Maryland as reported by the National Science Foundation (NSF) and 0.47% of total Maryland qualified R&D expenditures reported by program participants. And, as discussed further below, other features of the program's design and administration limit the tax credit's potential incentivizing effect.

Further, it is unclear that increased program funding would improve the program's potential effectiveness. As discussed previously, the existing literature presents mixed conclusions on the effectiveness of state R&D tax credits; notably, a recent evaluation of Iowa's incremental research activities credit found that the program has a weak, if any, effect on research inputs and outputs. Unlike Maryland's R&D tax credit, Iowa's incremental research activities credit is broadly refundable and is not subject to an annual aggregate cap. Nor is there any clear evidence to date that previous funding increases for Maryland's R&D tax credit have been effective. Most recently, overall annual program funding increased from \$9.0 million to \$12.0 million beginning with tax year 2016; between 2015 and 2021, Maryland business own-funded R&D expenditures

increased by about 61%, while U.S. business own-funded R&D expenditures increased by about 84%.

Number of Participating Businesses Has Declined in Recent Years

Exhibit 6.1 shows (1) the total number of businesses awarded the growth credit in each year and (2) for comparison purposes, the total number of businesses awarded the growth and/or basic credit in each of tax years 2000 through 2019 (*i.e.*, the total number of businesses awarded R&D tax credits in each of tax years 2000 through 2019). The basic credit was eliminated for tax years after 2019, as delineated by the vertical dashed line.



Source: Department of Commerce; Department of Legislative Services

Carryforwards and Other Program Factors Continue to Limit the Value of the Incentive; Refundable Small Business Credits Appear to Be Underutilized

Due to data limitations, DLS is unable to determine the extent to which tax credit awards are fully claimed in the first tax year – which, due to the program changes enacted under Chapter 609 of 2018, need not be the year in which the Maryland qualified R&D expense was incurred. (Data provided by the Comptroller’s Office suggests that at least some businesses awarded the R&D tax credit first claim the credit on a subsequent year’s return, given the number of returns with initial R&D tax credit claims in recent years.) However, available tax credit claims data suggest that the credit’s nonrefundability for non-small businesses continues to limit the value of the tax credit for those businesses. The Comptroller’s Office has historically advised DLS that it is unable to routinely identify and report the types of credits being carried forward by businesses claiming tax credits; thus, the amount of R&D tax credit carryforwards applied each year is unknown.

Available data also suggest that, despite the small business credit’s refundability, not all small business credits are fully claimed in the first tax year. Specifically, small business credit claims for tax years 2018 through 2022 were equal to about 50% of the total amount of small business credits awarded for those years. The reason for the observed disconnect between small business credit awards and claims is unclear.

DLS also notes that other program factors likely further limit the value of the tax incentive to firms. Specifically, (1) tax credits are awarded more than a year after the conclusion of the tax year for which the Maryland qualified R&D expenses is incurred, which reduces the present value of the credit and (2) the rate of credit is subject to proration based on the aggregate amount of credit applied for by businesses – the resulting uncertainty in future program benefits likely limits the program’s influence on firms’ R&D spending decisions.

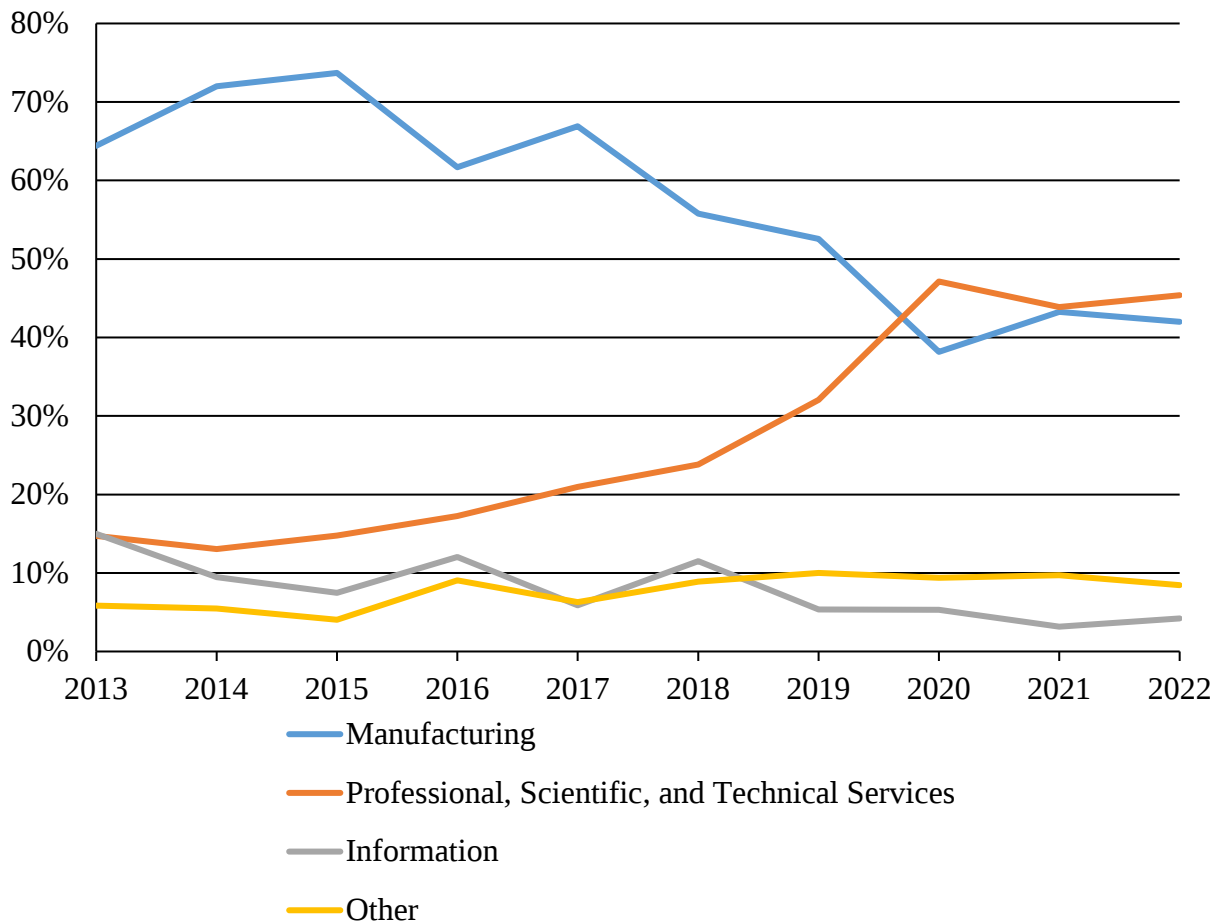
Increased Industry Diversity Among Program Participants in Recent Years

Over the last 10 years, companies in a total of 18 industry sectors claimed the R&D tax credit, including construction, wholesale and retail trade, transportation and warehousing, educational services, real estate, and finance and insurance. As noted in DLS’ 2018 evaluation report, the bulk of R&D tax credits are earned by businesses in the manufacturing industry; the professional, scientific, and technical services industry; and the information industry. Businesses in these industries earned 92% of all R&D tax credits awarded for tax years 2013 to 2022.

However, as shown in **Exhibit 6.2**, the manufacturing industry’s share of R&D tax credit awards has declined in recent years – from 74% in tax year 2015 to a low of 38% in tax year 2020. The professional, scientific, and technical services industry’s share of credits increased during this time – from 15% in tax year 2015 to a peak of 47% in tax year 2020. The manufacturing industry’s reduced share of credits in tax years 2020 through 2022 – and the professional, scientific, and technical service industry’s increased share of credits – is at least partly explained by the increased

share of total credits awarded to qualifying small businesses following the enactment of Chapter 114. Consistent with previous years, the professional, scientific, and technical services industry continues to account for a majority of small business credits; businesses in this industry earned nearly 70% of small business credits awarded for tax years 2020 through 2022. For context, according to data published by NSF's National Center for Science and Engineering Statistics, the manufacturing industry accounted for 69% of business own-funded R&D expenditures in Maryland in 2021 (the most recent year for which data is available), and the professional scientific, and technical services industry accounted for 10%.

Exhibit 6.2
Share of Total Research and Development Tax Credit Awards by Industry
Tax Year 2013-2022



Source: Department of Commerce; Department of Legislative Services

Legislative Changes Have Mitigated the Effects of Program Oversubscription; However, Businesses Receive Unequal Credit Rates

Prior to the enactment of Chapter 114 (which applies to tax years after 2019), annual oversubscription reduced the value of the R&D tax credit by about 90% on average. For context – for tax years 2015 through 2019, the average rate of the growth credit was approximately 1.2% compared to the statutory rate of 10%. While demand for the program continues to exceed available funding, the enactment of the \$250,000 per-taxpayer cap under Chapter 114 has mitigated the effects of program oversubscription. For tax years 2020 through 2022, participating businesses received about 60% of the maximum statutory benefit *on average* – i.e., an average credit rate of about 6% compared to the statutory rate of 10%.

Additionally, the \$3.5 million small-business set-aside is generally well aligned with actual small business tax credit applications. The small business credit was oversubscribed by about 13% for tax year 2020 (thus, participating small businesses received about 88% of the maximum statutorily allowable benefit on average) and undersubscribed by 10% and 22% in tax years 2021 and 2022, respectively (thus, participating small businesses received the full statutory benefit in these years).

However, since the introduction of the \$250,000 per taxpayer cap – which impliedly limits the tax credit benefit to the first \$2.5 million of Maryland qualified R&D expenses that exceed the Maryland base amount – the method by which the Department of Commerce (Commerce) determines the amount of tax credit awards unintentionally generates disparities in the credit rates (i.e., the rate of credit for the first \$2.5 million of Maryland qualified R&D expenses that exceed the Maryland base amount) awarded to businesses with different levels of incremental R&D expenses. Specifically, in its administration of the credit, Commerce allows businesses to apply for an amount of credit that exceeds \$250,000, initially approves and prorates tax credit amounts without regard to the \$250,000 cap, and subsequently applies the \$250,000 cap to amounts that exceed this limit after initial proration. Commerce then recalculates the proration factor for amounts that do not exceed \$250,000 after initial proration, applies the \$250,000 cap to amounts that exceed this limit after the recalculation, and repeats this process until (1) the aggregate amount equals the funding limit and (2) no amount exceeds the \$250,000 per taxpayer cap.

Thus, in each of tax years 2020 through 2021, some non-small businesses with significant incremental Maryland qualified R&D expenses above \$2.5 million received the maximum credit amount of \$250,000 (i.e., the statutory credit rate of 10%), while most non-small businesses received a prorated credit percentage, which varied by level of incremental R&D expenses:

- for tax year 2020, 78% of participating non-small businesses received a credit rate of 2.7%, 15% received a prorated credit rate greater than 2.7% but less than the statutory credit rate of 10%, and 7% received the statutory credit rate of 10%;

- for tax year 2021, 76% of participating non-small businesses received a credit rate of 3.0%, 13% received a prorated credit rate greater than 3.0% but less than the statutory credit rate of 10%, and 11% received the statutory credit rate of 10%; and
- for tax year 2022, 70% of participating non-small businesses received a credit rate of 3.3%, 20% received a prorated credit rate greater than 3.3% but less than the statutory credit rate of 10%, and 10% received the statutory credit rate of 10%.

Similarly, for tax year 2020 – the only year-to-date for which small business credit applications exceeded the \$3.5 million small business set-aside – 97% of participating small businesses received a credit rate of 8.5%, while 3% received the statutory credit rate of 10%.

Legislative Changes Have Reduced Concentration of Tax Credit Awards Among Largest Firms, Increased Small Business Credit Awards

Despite the aforementioned disparities in awarded tax credit percentages, the \$250,000 per taxpayer cap and \$3.5 million small-business set-aside enacted under Chapter 114 effectively reduced the concentration of tax credit awards among the largest participating firms and increased the amount of credits awarded to qualifying small businesses. For tax years 2020 through 2022, the largest 20% of participating firms each year (in terms of Maryland qualified R&D expenses) earned, on average, 58% of the total amount of tax credits awarded, compared to an average of 85% for tax years 2017 through 2019.

For context, **Exhibit 6.3** shows the number of tax credit awards and average Maryland qualified R&D expenses by certified tax credit value for tax years 2020 through 2022. Consistent with prior years, there was considerable variation in the volume of Maryland qualified R&D expenses of program participants. Also consistent with prior years, the program provides a modest credit to most participants; more than 50% of all tax credit certificates awarded for tax years 2020 through 2022 were equal to \$25,000 or less. The \$250,000 per-taxpayer cap enacted under Chapter 114 limited the value of the credit for businesses with significant incremental Maryland qualified R&D expenses; of the tax credits awarded for tax years 2020 through 2022, approximately 50 were affected by the \$250,000 cap.

Exhibit 6.3
Tax Credit Awards and Qualified R&D Expenditures
Tax Years 2020-2022

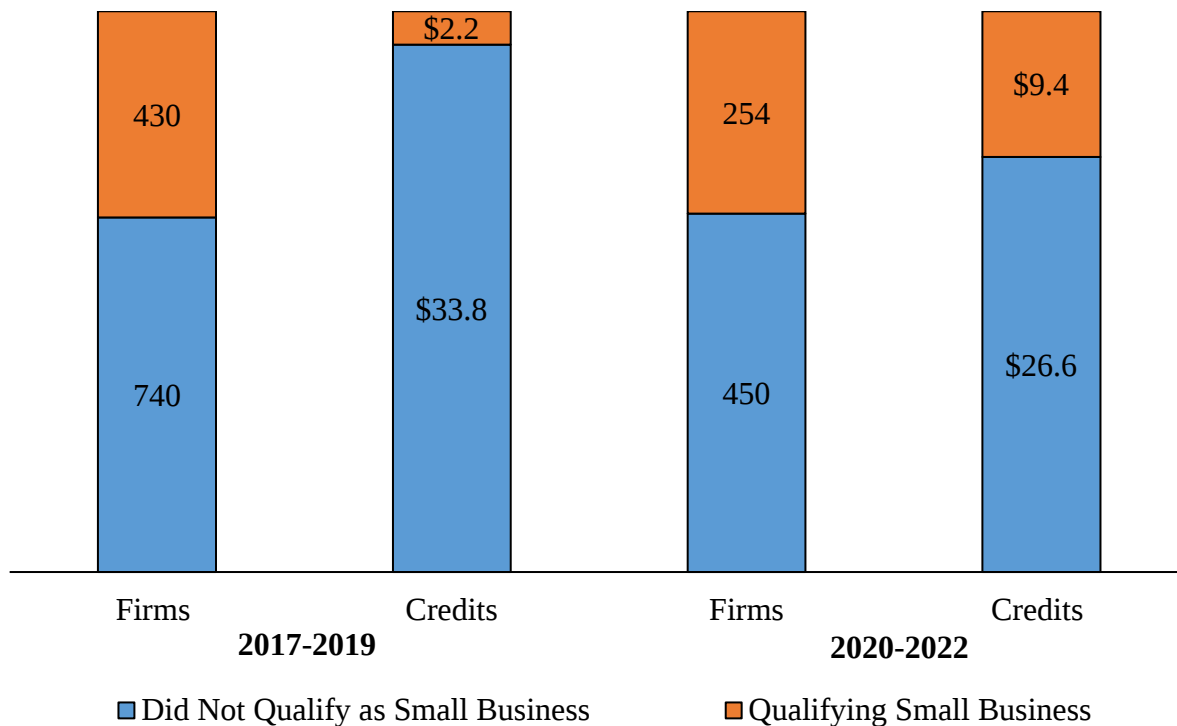
Tax Credit Value		Awards	Average Amount		Ratio of Credit to Maryland Qualified R&D Expenses (%)
<u>More Than</u>	<u>Up to</u>		<u>Maryland Qualified R&D Expenses</u>	<u>Certified Tax Credit</u>	
\$0	\$2,500	66	\$607,243	\$1,234	0.2%
2,500	10,000	163	1,051,353	5,580	0.5%
10,000	25,000	153	1,591,750	16,692	1.0%
25,000	50,000	129	3,234,837	35,745	1.1%
50,000	100,000	80	12,586,722	72,554	0.6%
100,000	200,000	52	11,441,824	137,870	1.2%
200,000	250,000	61	72,445,059	243,779	0.3%
All Businesses		704	\$9,791,678	\$51,136	0.5%

R&D: research and development

Source: Department of Commerce; Department of Legislative Services

Additionally, qualifying small businesses earned 26% of the total amount of tax credits awarded for tax years 2020 through 2022, compared to 6% of total tax credits awarded for tax years 2017 through 2019. Consistent with recent prior years, qualifying small businesses on average accounted for a little over a third of participating firms in tax years 2017 through 2022. **Exhibit 6.4** shows a comparison of qualifying small businesses' share of total participants and credits awarded for tax years 2017 through 2019 and tax years 2020 through 2022.

Exhibit 6.4
Firms and Credits Awarded by Qualifying Small Business Status
Tax Year 2017-2022
(\$ in Millions)



Source: Department of Commerce; Department of Legislative Services

For purposes of the R&D tax credit program, a small business is defined as a for-profit corporation, limited liability company, partnership, or sole proprietorship that, at the beginning or end of the taxable year for which Maryland qualified R&D expenses are incurred, has net book value assets totaling less than \$5,000,000 as reported on the balance sheet. “Net book value assets” means the total of a business’s net value of assets, including intangibles but not including liabilities, minus depreciation and amortization.

Chapter 7. Recommendations

Based on the information and analysis provided in this report, the Department of Legislative Services (DLS) makes a number of recommendations regarding the research and development (R&D) tax credit, as discussed below.

Recommendation: The General Assembly should consider terminating the R&D tax credit and instead explore other options to increase R&D activity in the State, such as providing State matching funds for federal Small Business Innovative Research grant awards or providing grants aimed at increasing human capital in science and technology fields.

As discussed previously, DLS finds that, while insufficient data is available to analyze the impact of recent program changes on statewide R&D activity, the program is unlikely to meaningfully impact statewide R&D activity. Annual program awards reflect a very small percentage of overall R&D spending in Maryland, and other features of the program's design and administration limit the credit's potential incentivizing effect. The existing literature on state R&D tax credits presents mixed conclusions on the effectiveness of such credits, and there is no clear evidence that previous funding increases for Maryland's R&D tax credit have been effective.

However, should the General Assembly choose to continue the tax credit program, DLS makes the following recommendations to improve the program.

Recommendation: The General Assembly should further define the goals and intent of the program in statute.

As discussed previously, Chapter 114 of 2021 stated that the purpose of the tax credit program is to foster increased research activities and expenditures in Maryland. Prior to Chapter 114, neither statute nor regulation specified the intent or objectives of the program. While the addition of this codified purpose language reflects an improvement from the previous program statute, it offers only limited guidance as to the program's goals and objectives. With additional specificity, DLS and the Department of Commerce (Commerce) can better evaluate the program's effectiveness and possible policy alternatives.

Recommendation: Commerce should ensure that all eligible program participants receive a uniform credit rate by applying the \$250,000 per taxpayer cap prior to calculating the proration factor.

As discussed previously, since the introduction of the \$250,000 per taxpayer cap – which impliedly limits the tax credit benefit to the first \$2.5 million of Maryland qualified R&D expenses that exceed the Maryland base amount – the method by which Commerce determines the amount of tax credit awards unintentionally generates disparities in the credit rates (*i.e.*, the rate of credit for the first \$2.5 million of Maryland qualified R&D expenses that exceed the Maryland base

amount) awarded to businesses with different levels of incremental R&D expenses. These disparities can be avoided by limiting the amount that may be initially approved to \$250,000 per taxpayer and subsequently calculating and applying the proration factor.

Recommendation: The Comptroller should update program regulations to reflect the current program statute.

Comptroller regulations relating to the tax credit program (COMAR 03.04.10) were last amended in 2014 and have not been updated to reflect subsequent legislative changes. Notably, the regulations continue to reference the basic credit, which is no longer authorized.

Recommendation: The General Assembly should require the Comptroller's Office to track and specify the treatment of credit carry forwards.

As discussed previously, the Comptroller's Office has historically advised DLS that it is unable to routinely identify and report the types of credits being carried forward by businesses claiming tax credits. With detailed data on carry forwards, DLS and the Comptroller's Office could better assess the utilization and cost of the R&D tax credit program and other tax credit programs.

Recommendation: Commerce and the Comptroller's Office should identify and comment on why refundable small business credits are potentially being underutilized.

Small businesses are presumably more likely to be responsive to the tax credit; however, the available data to date suggests that not all refundable small business credits are fully claimed in the first tax year. With a better understanding of the extent to which refundable small business credits are being underutilized and why, the small business incentive could be further evaluated and improved.