

IOWA **Department of REVENUE**

Iowa's Research Activities Tax Credit Tax Credits Program Evaluation Study

January 2008

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Preface

During the 2005 Legislative Session the Iowa Department of Revenue received an appropriation to establish the Tax Credits Tracking and Analysis System to track tax credit awards and claims. In addition, the Department was directed to perform periodic evaluations of tax credit programs. The evaluation of the State's Research Activities Tax Credit represents the second of these studies. This study makes no policy recommendations.

As part of the evaluation, an advisory panel was convened to provide input and advice on the study's scope and analysis. We wish to thank the members of the panel: Lane Palmer and Amy Johnson from the Iowa Department of Economic Development, Joel Lunde of the Iowa Department of Management, Dr. Peter Fisher of the University of Iowa, and Edward Wallace of the Iowa Taxpayers Association. (The assistance of an advisory panel implies no responsibility for the final product.)

This study and other evaluations of Iowa tax credits can be found on the Tax Credits Tracking and Analysis System web page on the Iowa Department of Revenue web site located at:

<http://www.state.ia.us/tax/taxlaw/creditstudy.html>.

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Executive Summary

Iowa introduced the Research Activities Tax Credit (RAC) in 1985, although the first corporate claim was not made until the 1986 tax year. The Iowa RAC allows taxpayers to take a refundable credit equal to 6.5 percent of qualified research expenditures made within the State above a base amount. The definition of qualified research expenditures and the calculation of the base amount are coupled with rules established as part of the federal research tax credit. In 2000, the legislature added an alternative method for computing the credit called the alternative incremental research credit (AIRC), mirroring the change made in the federal credit four years prior.

The RAC is considered an automatic credit because any taxpayer with qualifying expenditures is eligible for the credit. However, as part of an economic development tax credit programs, firms can be awarded a supplemental RAC that could as much as double their RAC claim. These awards are made by the Iowa Department of Economic Development.

The major findings of the study are these:

Research Tax Credits Across the United States

- Thirty-eight states currently have some form of research tax credit. Although Iowa's credit rate falls in the middle of the range offered across the states, Iowa is one of only five states with a refundable credit. For fiscal year 2006, research tax credit claims in Iowa equaled \$7.87 per capita compared to \$3.40 in Minnesota and \$3.32 in Wisconsin, neighboring states with nonrefundable credits.

Claims Counts and Values

- In tax year 2005, the latest complete year for corporate income tax returns, 172 corporate RAC claims were made totaling more than \$37 million dollars. Since the credit's introduction through 2005, over \$263 million in claims have been made by corporations carrying out research in Iowa.
- Individual taxpayers can also make RAC claims, although data have only been collected on those claims since 2002. In tax year 2005, 436 claims were identified on individual income tax returns totaling \$2.3 million.

Corporate Claims by Size and Industry

- Over 76 percent of total corporate RAC claim dollars have been claimed by firms with more than 500 employees and less than 8 percent has been claimed by firms with fewer than 100 employees.
- Over 80 percent of total corporate RAC claim dollars have been claimed by firms in manufacturing industries, with machinery manufacturing, computer and electronic product manufacturing, and chemical manufacturing as the top three industries with claims over the last 20 years.
- Although 140 to 170 firms file corporate RAC claims in recent years, the ten firms with the largest claims receive, on average, 82 percent of the RAC dollars each tax year.

Corporate and Individual Claims Detail from IA 128 and IA 128A

- For 2004, the most recent tax year with nearly complete detailed claim data, 10 percent of corporate RAC claims used the AIRC method rather than the regular method to calculate the credit. Those AIRC claims accounted for 48 percent of total RAC dollars claimed, including any supplemental credits.
- For the 2004 tax year, corporations report spending a total of \$764 million on qualified research activities in Iowa, for which these firms received \$33 million in research tax credits from the State, or 4.3 cents of tax credit per dollar spent on research.
- Since 2002, just over 30 percent of the dollar amount of RAC claims has been paid as supplemental credits, with over half of these supplemental credit dollars awarded to firms using the AIRC method.

Refundability

- Since 2002, on average 81 percent of corporations claiming the RAC received refunds. Of the total RAC dollars claimed by corporations, 92 percent consisted of refunds to those firms. For individual claimants, on average 22 percent received refunds. Of the total RAC dollars claimed by individuals, 47 percent consisted of refunds to those taxpayers.

Economic Analysis of the RAC in Iowa

- Economic analysis attempted to measure the impact of the research tax credit on research expenditures, research-related employment, or patent activity across states, but the results were not conclusive. In a comparison with neighboring states, the size of the credit percentage had a significant and positive effect on research spending and patents, but not on the number of scientists and engineers. In a comparison with other top manufacturing states, and in a comparison that pooled both sets of states, the size of the credit did not appear to affect any of the three indicators of research activity.
- This study did not involve any survey of, or contact with, claimants of the Iowa Research Activities Tax Credit. Therefore, it does not present any direct evaluation of claimants' perceived benefits of the credit or any changes in behavior that they would attribute to the credit. The study also does not present any information on the impact of the RAC on research-related employment within firms that have made claims for the credit.

Estimated Fiscal Impacts of Potential RAC Changes

- Data from 2004 corporate and individual income tax returns were used to estimate the fiscal impact, as of tax year 2004, resulting from changes to the RAC. Options considered were based on variations in research tax credit specifications observed in other states or for the federal credit. Those options ranged from limiting the credit to 50 percent of tax liability, which would have reduced claims by 92.5 percent, to increasing the credit rate percentage from 6.5 to 20 percent, which would have increased claims by 98.5 percent. This analysis was conducted for illustrative purposes only.

I. Introduction

The Iowa Research Activities Tax Credit (RAC) was instituted in tax year 1985, four years after the creation of the federal research tax credit. The goal behind the federal research tax credit is to subsidize research expenditures in recognition of potential social benefits that may not be considered in research spending decisions by individual firms. At the state level, however, a research tax credit may serve more as an incentive for locating and expanding businesses within the state than as a correction for a market failure.

This evaluation study is an attempt to understand the fiscal and economic impact of the RAC in Iowa. The study describes the various methods that can be used to compute the federal and Iowa credit including some example credit calculations, discusses the existing literature on the research tax credit, provides a synopsis of research tax credits that exist around the country, and analyzes corporate and individual RAC claims data gleaned from Iowa tax returns over the past twenty years. Economic analysis results attempt to discern whether different characteristics of research tax credits, such as refundability, across the states can explain differences in research expenditures or research-related employment. Estimates of fiscal impacts from potential changes to Iowa's RAC, using variations of research tax credits offered by other states, are presented for illustrative purposes only. The final section discusses anticipated ongoing evaluation of this credit.

This study did not involve any survey of, or contact with, claimants of the Iowa Research Activities Tax Credit. Therefore, it does not present any direct evaluation of claimants' perceived benefits of the credit or any changes in behavior that they would attribute to the credit. The study makes no attempt to track research employment in Iowa over the last twenty years, nor does it present any information on the impact of the RAC on research-related employment within firms that have made claims for the credit.

II. Definitions and Methods for Computing Research Tax Credits

A. The Federal Research Tax Credit

The federal research tax credit, also referred to as the Research and Experimentation Tax Credit or R&E tax credit, is a 20 percent income tax credit for qualified research expenditures.¹ The credit is not refundable, although unused credits can be carried back three years or forward up to 15 years. In tax year 2004, R&E tax credit claims totaled \$5.6 billion (CBO, 2007). The credit is actually the sum of four possible credits: a regular research credit, an alternative incremental research credit (AIRC), an alternative simplified incremental credit (ASIC), and a basic research credit. There is also a flat credit of 20 percent for energy research, enacted in the Energy Policy Act of 2005, which is not discussed further here. In any given tax year, eligible taxpayers may claim the basic research credit and either the regular research credit, the AIRC, or the ASIC. However, taxpayers who choose to compute their credit using one of the alternative credit methods are required to continue to use that method in future tax years, even if the regular research credit would produce a larger credit, unless given specific permission by the IRS to change credit calculation methods.

The federal research tax credit was created in July 1981 and has been temporarily renewed 12 times, covering every year since its inception but one (June 30, 1995-July 1, 1996).² The credit has undergone five major modifications. In 1986 the basic research credit was separated from the regular

¹ The federal research tax credit is specified in section 41 of the Internal Revenue Code (IRC). Federal tax law also allows for a full expensing of qualified research spending under Section 174 of the IRC. However, if a firm takes a deduction for research expenditures and claims the research tax credit for those same expenditures, the firm must reduce the deduction by the amount of the credit claimed.

² The credit expired at the end of 2007.

research credit and the credit rate for both was dropped from the original 25 percent to 20 percent. The basic research credit can be claimed for payments made for basic research conducted by universities or non-profit research organizations above a base amount.³ Basic research is defined in the IRC as “any original investigation for the enhancement of scientific knowledge not having a specific commercial objective.” The credit does not apply to research done outside the United States or basic research in social sciences, arts, or the humanities. This part of the federal research tax credit is not discussed further.

The most significant change to the federal research tax credit occurred in 1989 when the computation of the base amount of qualified research expenditures for the regular research tax credit was restructured. Originally the base amount was a function of average research expenditures from the three previous tax years; in 1989 the period for computing the base amount of research was fixed as 1984 through 1988. Other changes adjusted the definition of qualified research expenditures (QRE). As defined by the Internal Revenue Code (IRC), research eligible for the research tax credit must meet four criteria (Guenther, 2007):

1. Research must be “experimental;”
2. Research must be undertaken to discover information that is “technological in nature;”
3. Research should be useful in the development of a new or improved product, process, formula or invention;
4. Research must relate to activities that constitute experimentation with a goal of developing a new product or process.

For in-house research, when the business undertakes research at its facilities, only outlays on wages, salaries, supplies, and certain time-sharing costs for computers used to conduct the research are eligible. For contract research, when the business allocates resources for research by outside institutions, only 65 percent of amounts paid are eligible. That share rises if the research is performed by non-profit organizations (75 percent), or by small firms, universities, or federal laboratories (100 percent). Non-eligible expenses include costs of equipment or structures, overhead costs, or fringe benefits for employees.

The regular research credit is an incremental credit, that is, only research activities that exceed a base amount of research expenditures are eligible. The base amount is intended to approximate a firm’s level of research expenditures in the absence of the credit (CBO, 2007). Firms with both business revenue and research expenditures for three or more years during the 1984 to 1988 period are designated as established firms. The base amount for established firms is computed by multiplying average gross receipts for the four years prior to the credit claim by the fixed-base percentage. The fixed-base percentage equals total QREs for the 1984 to 1988 period divided by total gross receipts for that same period. The fixed-base percentage is capped at 16 percent. Non-established, or new, firms are assigned an initial fixed-base percentage of three percent during the first five years that the firm reports both receipts and qualified research expenditures. After five years, the percentage is gradually adjusted based on actual experience; by the eleventh year the fixed-base percentage is based on total QREs relative to total receipts in the sixth through tenth tax years. In all cases, the base amount is equal to the larger of the amount computed using one of the above methods or 50 percent of current year QREs. The base amount is intended to roughly equal the research expenditures of a firm in the current tax year if the firm allocates the same share of gross receipts towards research today that the firm allocated during the base period. Because the 20 percent credit only applies to research expenditures above the base amount, the credit creates an incentive to increase research by reducing the after-tax cost of those incremental research expenditures.

³ See Guenther (2007, p.9-10) for a discussion of how the basic research base amount is computed. This base amount is unrelated to the base amount used to compute the regular research credit, AIRC, or ASIC.

The AIRC, first introduced in 1996, is equal to 2.65 percent of research expenditures above 1 percent but not greater than 1.5 percent of average gross receipts in the four previous years, plus 3.2 percent of research expenditures above 1.5 percent but not greater than 2.0 percent of average gross receipts, plus 3.75 percent of research expenditures that exceed 2.0 percent of average gross receipts. For tax year 2007, the AIRC rates will increase from 2.65, 3.2 and 3.75 percent to 3.0, 4.0, and 5.0 percent.

The ASIC was introduced January 1, 2007. Firms using this method can take a credit equal to 12 percent of QREs that exceed 50 percent of QREs in the three preceding tax years. For firms that do not have QREs in the three previous years, the credit is 6 percent of current year QREs.

Example calculations of the federal regular research credit and the AIRC for tax year 2006 are presented in Table 1.⁴ The firm constructed for this example had both sales and qualified research expenditures for the entire base period, and thus is considered an established firm. To compute the regular credit, the first step is to compute the fixed-base percentage by dividing total QREs in 1984 through 1988 by total gross receipts for that same period. This establishes the fixed-base percentage of 4.15 percent which is well below the 16 percent cap. Step two, compute the base amount of QREs, \$64.30 million, by multiplying the average gross receipts of the firm for the four years prior to the current tax year by the fixed-base percentage. Step three, compute the research expenditures eligible for the credit, \$38.70 million, by subtracting from current year QREs the larger of the base amount or 50 percent of current year QREs. For this firm, the base amount is the larger quantity. Step four, multiply the eligible research expenditures by the 20 percent credit rate to compute the federal credit, \$7.74 million.

To compute the alternative incremental research credit for the same firm, the first step is to compute the amount of QREs above the specified shares (1, 1.5, and 2 percent) of average gross receipts from the four previous years. This firm had \$87.50 million QREs above 1 percent of average gross receipts, \$79.75 million above 1.5 percent, and \$72.00 million above 2 percent. Step two, compute the three components of the AIRC by multiplying the credit rates by the difference of the various incremental QREs. Multiply 2.65 percent by the difference of QREs between 1 and 1.5 percent of average gross receipts to get \$0.21 million; multiply 3.2 percent by the difference of QREs between 1.5 and 2 percent of average gross receipts to get \$0.25 million; and multiply 3.75 percent of QREs above 2 percent of average gross receipts to get \$2.70 million. Step three, sum the three credit components to determine the federal AIRC credit, \$3.15 million. Note that this firm would get the biggest credit using the regular research credit calculation method.

Under the regular research credit, the lower the firm's fixed-base percentage, that is, the lower the QREs were in 1984 to 1988 relative to receipts, the higher the current year tax credit is on a given amount of research expenditures. Likewise, the higher the ratio of current year QREs to average gross receipts from the prior four years relative to the fixed-base percentage, the higher the regular research credit will be. A firm will benefit from using the AIRC over the regular credit if the firm's sales receipts have been increasing at a greater pace than research expenditures, if research expenditures are declining, or if the firm had a high intensity of research expenditures during the base period. However, because a firm is not able to freely switch back to the regular credit, consideration of expected future years' research expenditures and sales will be important in the decision of which method to use in computing the federal credit.

An additional example of the federal credit calculations is presented to show how changes in sales growth relative to growth in QREs will change the relative value of the credits (see Table 2). This

⁴ The ASIC is not considered because it was not in effect in tax year 2006.

hypothetical firm is the same as the one considered in Table 1 except gross receipts are growing two and one-half times faster starting in 2002. In step two, the higher average gross receipts over the four previous years raises the base amount under the regular credit from \$64.30 to \$98.21 million. The higher base amount decreases the research expenditures eligible for the credit and thus the credit itself. Under the AIRC, average gross receipts are still used in the calculation, but they have a much smaller impact on the final credit claim. For this example, the higher sales growth reduces the regular credit by 88 percent while the AIRC falls by only 12 percent. Thus the AIRC provides the largest credit for this firm.

B. The Iowa Research Activities Tax Credit

For tax years beginning on or after January 1, 1985, taxpayers can claim an income tax credit equal to 6.5 percent of Iowa's apportioned share of qualifying expenditures for increasing research activities. The computation of the Iowa RAC is based on the methods used to compute the federal research credit, although credit rates are lower for Iowa and the qualified research expenditures eligible for the credit are only those carried out within the state. Unlike the federal research credit, the Iowa credit is refundable and, for tax years beginning on or after January 1, 1991, is permanent, thus the Iowa credit will remain even if the temporary federal credit is allowed to expire.

The Iowa definition of QREs is coupled with the federal definition. QREs include wages for qualified research services performed in Iowa, the cost of supplies used in conducting qualified research in Iowa, the rental or lease cost of personal property such as computers used in Iowa in conducting qualified research, and sixty-five percent of contract expenses paid by a corporation to a qualified organization for basic research performed in Iowa. Where personal property is used both inside and outside of Iowa in conducting qualified research, the rental or lease cost must be prorated between Iowa and non-Iowa use by the ratio of days the property is used inside of Iowa to total days used. The share of Iowa QREs is simply the Iowa amount divided by total QREs as reported on the federal claim for the credit.

The value of qualified expenditures subject to the Iowa credit is computed in the same manner as for the federal credit. The regular research credit applies to the smaller of the amount by which the qualified research expenditures for the taxable year exceed a base amount of expenditures or 50 percent of the qualified research expenditures for the current taxable year. The base amount of expenditures for the Iowa credit equals the base amount under the federal credit. Information underlying a claim for the regular Iowa RAC must be provided on form IA 128.

Starting with tax year 2000, Iowa taxpayers can elect to take the alternative incremental research credit, similar to the federal AIRC, where the applicable credit percentages are 1.65, 2.20, and 2.75 percent. The one significant difference between the Iowa and federal AIRC is that the Iowa credit is computed using average annual Iowa gross receipts rather than average annual U.S. gross receipts. Because the regular credit compares research expenditures to average annual U.S. gross receipts, the AIRC is advantageous to firms with high research expenditures in Iowa relative to sales in the State. The taxpayer can elect each year whether to take the alternative credit or the regular research credit for Iowa tax purposes and can choose a method independent of the method used to claim the federal credit. Information underlying a claim for the Iowa AIRC must be provided on form IA 128A.

Example calculations of the Iowa regular and alternative incremental research credit are presented in Table 3 based on the same hypothetical firm considered in the first federal example (see Table 1). The first step to compute the Iowa regular credit matches the federal credit calculation, determine the fixed-base percentage, 4.15 percent, by dividing total QREs in 1984 through 1988 by total gross receipts for that same period. Step two also follows the federal credit calculation, compute the base amount of QREs, \$64.30 million, by multiplying the average annual U.S. gross receipts of the firm for the four years prior to the current tax year by the fixed-base percentage. Step three for the Iowa

credit is to compute to three decimal places the Iowa share of QREs as the ratio of Iowa QREs to total QREs, 20.000 percent. Step four, compute the research expenditures eligible for the credit, \$7.74 million, by subtracting from current year QREs the larger of the base amount or 50 percent of current year QREs and multiplying that amount by the Iowa share of QREs. Step five, compute the Iowa credit by multiplying the eligible research expenditures by the 6.5 percent credit rate, \$0.50 million.

The Iowa AIRC is also closely based on the federal AIRC, although the applicable gross receipts and expenditures are only those occurring in Iowa and the credit rates are lower. Step one, compute the amount of QREs above the specified shares (1, 1.5, and 2 percent) of average Iowa gross receipts from the four previous years. This example firm had \$17.50 million QREs above 1 percent of Iowa average gross receipts, \$15.95 million above 1.5 percent, and \$14.40 million above 2 percent. Step two, compute the three components of the AIRC by multiplying the credit rates by the difference of the various incremental QREs. Multiply 1.65 percent by the difference of QREs between 1 and 1.5 percent of Iowa average gross receipts to get \$0.03 million; multiply 2.2 percent by the difference of QREs between 1.5 and 2 percent of average gross receipts to get \$0.03 million; and multiply 2.75 percent of QREs above 2 percent of average gross receipts to get \$0.40 million. Step three, sum the three credit components to determine the Iowa AIRC credit, \$0.46 million.

Because the Iowa incremental credit rates, 1.65, 2.2, and 2.75 percent, are relatively closer to the federal AIRC rates, 2.65, 3.2, and 3.75 percent, than the Iowa regular credit rate of 6.5 percent is to the federal regular credit rate of 20 percent, the Iowa AIRC is more generous relative to the Iowa regular credit than is the federal AIRC relative to the federal regular credit. This can be seen by comparing the different federal and Iowa credit amounts for the example firm in Tables 1 and 3. While the federal regular credit is 145 percent greater than the federal AIRC for the example firm, the Iowa regular credit is around 9 percent greater than the Iowa AIRC. Table 4 presents the Iowa credit computations for the firm with faster growing sales, mirroring the federal credit computations seen in Table 2. While both the federal and Iowa AIRC become more generous for this second example firm, the federal AIRC is about three times greater than the regular federal credit but the Iowa AIRC is over six times greater than the Iowa regular credit. The gap between the federal and Iowa AIRC will be widened slightly in tax year 2007 when the federal AIRC credit rates increase while the Iowa rates do not.

The example in Table 4 demonstrates that, like the federal AIRC, the Iowa AIRC can be beneficial to companies with sales growing faster than research expenditures. However, because the Iowa AIRC measures research expenditures relative to gross receipts from Iowa only, the Iowa AIRC is also beneficial to firms with a low share of total U.S. sales in the State. This is demonstrated in Table 5, where credits are computed for a hypothetical firm similar to that considered in Table 4 except the share of total U.S. sales occurring in Iowa is lowered from 20 percent to 5 percent. Using the lower gross receipts amount in the calculation increases the AIRC claim from \$0.40 million to \$0.52 million, a 32 percent increase. At the same time, the change in Iowa's share of sales does not alter the calculated value of the firm's regular credit, \$0.06 million.

Taxpayers who are approved by the Iowa Department of Economic Development (DED) under the New Jobs and Income Program, the New Capital Investment Program or the Enterprise Zone Program can receive a supplemental Research Activities Tax Credit which can as much as double the credit claim. The RAC can also be doubled by DED under the High Quality Job Creation Program. That program has replaced the New Jobs and Income Program and the New Capital Investment Program which were repealed as of July 1, 2005, although those programs may still have active contracts. Unlike the previously discussed credits which can be claimed by any firm with qualified research expenditures in the states, the supplemental RACs are awarded by DED as part of a contract tied to a business expansion or a business retention project. These supplemental RACs have become a substantial part of Iowa claims as will be presented in Section V.

Effective July 1, 2005, DED was authorized to award an additional \$1 million in supplemental RAC for expenses related to the development and deployment of innovative renewable energy generation components manufactured or assembled in Iowa. These expenses need not be considered QREs under the federal definition if approved by DED under the Enterprise Zone Program or the High Quality Job Creation Program. Given the time delay in collecting data, none of these credit claims have yet been identified.

A taxpayer may claim on the taxpayer's individual income tax return the pro rata share of an RAC for qualifying research expenditures incurred in Iowa by a partnership, S-corporation, limited liability corporation, estate, or trust. The portion of the credit claimed by the individual must be in the same ratio as the individual's pro rata share of the earnings of the partnership, S-corporation, limited liability corporation, estate, or trust.

III. Literature Review

Various papers describe and analyze the research tax credit at the international, federal and state level. Most begin with a discussion for why such a credit should exist. Because research produces positive externalities, in the absence of government intervention, such research would be undersupplied (CBO, 2007; Guenther, 2007). By offering a tax credit for research expenditures, the government lowers the effective price of research such that businesses will demand more, pushing the total amount closer to the socially optimal level. However, it is also recognized that the positive externalities are not constrained by state boundaries, and thus the economic rationale for a state research tax credit is less straight forward (Hall and Wosinska, 1999). Indeed, state-level research tax credits may have more to do with improving the local business climate and attracting high-paying jobs than any attempt to correct for market failures.

Another common issue discussed in the research tax credit literature is a description of the ideal evaluation of the credit. This evaluation would compare the social benefits gained from the additional research induced by the credit to the social costs of foregoing other public services due to the credit's negative impact on tax revenues (CBO, 2007; Guenther, 2007; Ibele and Vasche, 2004; Hall and Van Reenen, 2000). However, because of data limitations, the authors note this ideal can rarely be met. Rather evaluations, at best, compare the amount of incremental research induced by the credit to the loss in tax revenue. Along those same lines, most attempts at benefit-cost analyses ignore the administrative costs of the credit and thus understate the cost of supporting research through the tax code (CBO, 2007; Hall and Van Reenen, 2000).

Hall and Van Reenen (2000) compare research tax credits across the developed and some developing countries. They note the fluidity of corporate income tax systems and how changes in either the overall corporate tax or the research credit itself can have a dramatic impact on the effective cost of research expenditures. They also note wide disparities in the effective credit across firms within countries depending on refundability of the credit, a firm's tax liability, the existence of credit caps, and the definition of the base amount of research against which current research expenditures are compared. Their comparison of research credit evaluations focuses on the United States because the authors found few studies available from other countries.

In addition to the updated Congressional Research Service discussion of the credit in its *Tax Expenditures Compendium* (CRS, 2006), both the Congressional Budget Office (CBO, 2007) and the Congressional Research Service (Guenther, 2007) have recently released an analysis of the federal research tax credit. CBO (2007) notes that in the existing literature few studies examine the federal credit after its major change in 1989. One study does claim that the current version of the credit

encourages \$2.10 worth of research expenditures for every \$1 of foregone revenue; however, this could be driven by firms' incentives to relabel existing expenditures as research rather than true growth in research.

The extent to which firms respond to the incentive of a lower research price is measured by the price elasticity of research. For example, if the price elasticity of research is estimated to be -0.5, then a 10 percent reduction in the price of research leads to a 5 percent increase in research expenditures. Because the federal research tax credit only applies to incremental research above a specified base level, the actual price reduction from these credits is quite small. Guenther (2007) estimates that over the 1996 to 2003 period the federal research tax credit, with a rate of 20 percent, only lowered the after-tax cost of industrial research in the United States by 3.3 percent. Combined with an estimated price elasticity between -0.5 and -1.0, he notes the federal credit may have raised business research and development spending by 1.65 to 3.3 percent over that period, which implies much of the research spending that benefited from the tax credit would likely have occurred anyway. Indeed, Wilson (2007a) quotes a report from the Office of Technology Assessment in 1995 that stated most research strategists regarded the federal research tax credit as irrelevant to their planning. Guenther (2007) also discusses five flaws that are commonly cited regarding the federal research tax credit: 1. lack of permanence, 2. weak and arbitrary incentive effects, 3. non-refundable status, 4. an ambiguous definition of qualified research, and 5. inability to target research with the greatest social returns.

A study by the United States Government Accounting Office (GAO, 1996) discusses eight research papers that evaluated the effectiveness of the federal research tax credit. The study notes that, theoretically, an incremental research credit like the federal credit should have more "bang-per-buck" than a flat credit, one that would subsidize all research expenditures rather than just those expenditures above a base amount; however, none of the empirical evidence presented in the GAO analysis addressed this point. The various research papers analyzed by GAO used firm-level or industry-level data to measure the incentive provided by the credit. The price elasticity of research expenditures was estimated using a dummy variable for firms eligible for the credit or a measure of the tax price of research in the presence of the credit. Half of the papers supported the view that the additional research induced by the research tax credit exceeds the revenue cost of the credit, while the other half did not. The different conclusions were driven by the data and methods used. Studies that used dummy variables to indicate firm-level eligibility for the credit found weaker results than those that relied on industry-level analysis or tax-price measures with firm-level data. One criticism GAO raises about all of the studies is their reliance on publicly available data about firm expenses and profits. Although easily accessible, public data lacks information on actual qualified research expenditures and income tax liability which would be available in firm-level tax return data. GAO also notes that almost all of these studies used data prior to the major restructuring of the credit in 1989. Based on data and methodological limitations, the GAO concludes much uncertainty remains regarding the true effectiveness of the federal research tax credit.

After the federal government enacted its research tax credit in 1981, states slowly began to enact credits of their own. Wilson (2005b), in a summary of his research on the rise and spread of state research tax credits, first notes that most states rely on the federal definition of qualified research expenditures in order to piggyback off the federal government's administrative decisions. However, little else is common among state research tax credits. While states' credit rates vary dramatically, he claims the more important difference in determining the generosity of a state's credit is how the research expenditures base is computed. Some states have no base, that is, the credit applies to all research expenditures not just incremental expenditures. Other states compute the base as a moving average of a firm's research expenditures over the past few years, while others follow the federal credit and use recent sales times the average of the firm's research-to-sales ratio from a past, fixed period. Wilson also notes that during the 1990's and 2000's the research tax credit has spread to

more states and that the new credits have, on average, been more generous. Indeed the average effective credit rate, determined by considering the statutory rate and the base definition, across all states with credits rose from under one percent in the early 1980's to almost six percent by 2005.

As noted above, states enacting research tax credits often have different goals than the federal government because states are less able to reap the social benefits from any additional research. Rather, states view the credit as another means to entice corporations to locate or expand facilities and employment within their borders. Wilson (2005a) considers whether the expansion of research tax credits across the states has increased social returns from research or simply resulted in zero-sum tax competition between the states. He presents evidence that a reduction in the lowest after-tax state cost of research in a given year, driven by the largest state research tax credit, has a detrimental effect on the average research spending in other states. Thus it appears firms are willing to incur costs to move research activities between states to take advantage of higher tax credits. Wilson estimated that the magnitude of this negative impact nearly equals the positive impact from a reduction in the user cost within a state, thus the net elasticity is near zero. This result suggests that state-level research tax credits are not able to expand research, rather they simply shift research dollars between states as firms play one state against another to minimize their overall tax liability.

The belief that business tax credits are negative aspects of a state's tax system is advanced by the Tax Foundation (2007). Its State Business Tax Climate Index purports to measure the impact of each state's corporate income tax system on business activities. Claiming that tax credits "complicate the tax system, narrow the tax base, drive up tax rates for existing companies, and distort the free market," the index treats the existence of a research tax credit as a negative aspect of a state's corporate income tax (Tax Foundation, 2007, p.15). Iowa received a ranking of 45 out of the 50 states for its corporate income tax, reflecting the fact the State has the highest marginal tax rate on the books and a graduated system that is not indexed for inflation. However, the index fails to account for the 50 percent federal deductibility offered in Iowa which lowers taxable income and thus the effective tax rate. The index also does not consider the State's 100 percent sales apportionment formula. In addition, Iowa's score is dragged down by penalties applied against the State for providing investment tax credits, job tax credits and the RAC.

A few papers also evaluate the research tax credits within individual states including California, Georgia, Washington and Maine. The initial motivation for the California research tax credit, enacted in 1988, was conformity with the federal tax code, but later the credit became a tool to attract high-paying manufacturing jobs (Hall and Wosinka, 1999). The authors lament that they were unable to provide any evidence as to whether the credit was indeed meeting the latter goal. A second California study recommended that the legislature refrain from expanding the credit and consider phasing it out given little evidence that the credit provides strong benefits to the state relative to its high revenue cost (Ibele and Vasche, 2004).

Paff (2005) presents a firm-level analysis of the impact of California's 1997 increase in the research tax credit percentage. Using a difference-in-difference approach with Massachusetts as the control state, she compares research expenditures by biopharmaceutical and software firms in California and Massachusetts before and after the credit change in California. Models that control for time across the panel suggest that the credit change had little impact on research expenditures in California for the industries studied.

A study of the Georgia research and development tax credit notes that little evidence exists to support the view that encouraging research expenditures within a state will increase employment and the standard of living (Wheeler, 2005). The study discusses recent suggestions for modifying the state credit, but provides no evidence as to the impact of the existing credit.

A study completed by the State of Washington regarding tax incentives for research compares the tax liability that hypothetical firms undertaking research would face in the state with and without existing tax incentives and in six other states considered to be Washington's competitors (Washington, 2003). Results show how the research tax credit in Washington is more generous to most firms than other states' credits because Washington allows the credit on every dollar spent on research, not just incremental expenditures.

Maine has an extensive, ongoing evaluation of its public investment in research and development which has included a research tax credit since 1996 (PolicyOne, 2006). One part of this evaluation will consider whether Maine's public investment has stimulated growth in the economy by looking at changes in employment, business establishments, gross domestic product in the state, and per capita income of citizens. Likely all states with a research tax credit hope it will similarly stimulate such economic activity.

IV. Research Tax Credits Across the United States

Thirty-eight of the fifty states currently have some type of tax credit to encourage research expenditures (see Table 6). While each state's credit is different, some credits have similarities. Most states, including Iowa, only allow the credit for research undertaken within their borders. Another area in which credits may be similar is how the credit is calculated. Seventeen of the states, including Iowa, determine the base amount of qualified research expenditures for their credit following the rules of the federal credit which compares current research expenditures to the level of expenditures during the 1984 through 1988 historical base period. Nine states use a unique base period, varying from a comparison of current year research expenditures to expenditures in the previous year (Pennsylvania) to the previous four years (Delaware). Credits also differ in what expenses are considered qualified. Most states use the federal definition of qualified research expenditures, although some states include expenses on the construction or upkeep of research facilities. The most common credit rate percentage is 5 percent, far below the federal rate of 20 percent, although the rates range from as low as 1.9 percent in Michigan to as high as 22.5 percent in Rhode Island.

Minnesota enacted its research tax credit in 1981, the only state to do so before Iowa. Iowa and Indiana enacted their research tax credits in 1985. Six additional states enacted credits in the second half of the 1980s, Arkansas, California, Colorado, Oregon, North Dakota, and Wisconsin. Fourteen states passed credits during the 1990s and sixteen states have added research tax credits since 2000. Missouri, which enacted its credit in 1994, has since repealed the credit effective January 1, 2005.

Other than Iowa, only Hawaii, Louisiana, Nebraska, and New York, have refundable research tax credits, although Connecticut and West Virginia have provisions that make the credit refundable for businesses which meet the small business criteria for each state. Not only are credits nonrefundable in all of the other states, many limit the amount of a credit claim to 50 or 75 percent of current year tax liability (Delaware, Georgia, Michigan, New Jersey, Rhode Island, South Carolina, and Texas). Other states place a dollar limit on a taxpayers' credit claim (Massachusetts, New York and Washington) or have a cap for total credits claimed in a given tax year (Connecticut and Maryland). Some states have provisions that allow firms with current-year credits that exceed current-year tax liability to carry them forward and reduce future-year tax liability. The carry forward period in some states is extended until credits are fully utilized (California and Colorado) while in other states the carry forward period is limited to just three tax years (Arkansas). Only Montana allows a taxpayer to carry back the credit; the carry back period is two years. Other states allow credits to be transferred, that is, a firm that does not have sufficient tax liability to take advantage of the full credit during the current tax year can sell the credit to another firm with positive tax liability, usually at a discount (Arkansas and Louisiana).

Allowing credits to be transferred makes it possible for a firm to use the entire credit in the same year the credit was earned regardless of tax liability. Although transferability is more attractive than a carry forward, it is still not equivalent to refundability because of the discounting involved in the transfer.

Four of Iowa's six neighbors currently offer a research tax credit. While Iowa and Illinois both offer a 6.5 percent credit, Illinois allows only a five-year carry forward period while Iowa's credit is refundable. Minnesota allows a non-refundable 5 percent credit on the first \$2 million and 2.5 percent above that amount with a 15-year carry forward. Wisconsin allows a 5 percent credit with a 15-year carry forward and includes infrastructure costs as qualified research expenditures unlike the federal and Iowa credits. Nebraska's relatively new research credit is also refundable, but the credit rate is only 3 percent. Missouri no longer offers a research tax credit, but from 1994 through 2004, its credit was 6.5 percent with a five-year carry forward. South Dakota does not offer any credit because it does not levy tax on corporate or individual income.

Although credit rules can suggest differences between credits, a more direct way to compare the states' research tax credits is to compare recent tax expenditure estimates prepared by Iowa and its neighbors. For fiscal year 2006, Iowa estimates the research tax credit reduced corporate income tax receipts by \$21.1 million and individual income tax receipts by \$2.3 million, or \$7.87 per capita.⁵ Iowa's supplemental RAC reduced corporate income tax receipts an additional \$8.4 million for a total of \$31.8 million. Illinois estimates its research tax credit reduced fiscal year 2006 corporate income tax receipts by \$645 thousand and individual income tax receipts by \$1.2 million or \$0.15 per capita (State of Illinois, 2007). Minnesota's estimated impact of its research tax credit on corporate tax receipts totaled \$17.5 million for fiscal year 2006 or \$3.40 per capita; no expenditure was provided for individual income tax receipts (Minnesota Department of Revenue, 2006). An estimate for the impact of Nebraska's new research tax credit was not available in its most recent tax expenditure report (Nebraska Department of Revenue, 2006). Wisconsin estimates its research tax credit, which also includes a credit for expenditures on facilities, reduced corporate income tax receipts by \$18.5 million for fiscal year 2006 or \$3.32 per capita; no expenditure was provided for individual income tax receipts (State of Wisconsin Department of Revenue, 2007).

As will be seen below, in Iowa the majority of research tax credit claim dollars are claimed by firms in the manufacturing industry. In 2006, Iowa's share of non-farm employment engaged in manufacturing, 15.4 percent, was one of the seven highest in the nation along with: Indiana (19.0), Wisconsin (17.7), Arkansas (16.6), South Carolina (16.0), Mississippi (15.4), and Alabama (15.3). Although it is reasonable to consider that Iowa competes with surrounding states to attract research expenditures by these manufacturing firms, Iowa may also be in competition with these other manufacturing-heavy states. Arkansas and Indiana both offer 10 percent credits with 3- and 10-year carry forward periods, respectively. South Carolina has a 5 percent credit with a 10-year carry forward, although it is capped at 50 percent of annual tax liability. Mississippi offers a research-related job credit that can be claimed against the corporate income tax. The credit equals \$1,000 per each net new full-time employee in research fields for the first five years of employment, with a 50 percent tax liability cap per firm. Alabama has no credit.

Another variation across the states is the existence of alternative methods for calculating the credit. As noted in Section II, the federal government currently allows for three methods to calculate its research tax credit. Several states, including California, Iowa, Indiana, and Wisconsin, allow firms to claim some variation of the federal alternative incremental research credit as an alternative to the regular credit. Other states have created additional, alternative methods of calculation. Because each state's credit is unique, it is difficult to objectively compare research tax credits across the states.

⁵ Per capita amounts were computed by dividing the total research tax credit expenditure amount by the U.S. Census state population estimate for July 1, 2006.

V. Analysis of Iowa Research Activities Tax Credit Claims

A. Claims Counts and Values

A panel of Iowa corporate income tax returns over the 1986 to 2005 tax period reveals several interesting trends in Research Activities Tax Credit claims.⁶ The first claim for the RAC was made in the 1986 tax year for \$245 (see Figures 1 and 2). In 1989 nearly 200 firms claimed the credit with an average nominal claim of \$23,000. The largest number of corporate claims was 392 filed in the 1992 tax year, although the average nominal claim fell to just \$13,500 that year. Throughout the late 1990's and early 2000's the number of claims leveled off around 140, less than half of the peak count. However, average and total claims rose dramatically during that time, both in nominal and real 2005 dollars. In tax year 2005, the latest year of data, the 172 corporate claims totaled \$37 million for an average claim of over \$216,000. Tax year 2000 saw the biggest jump in average claim amounts when the number of claims fell slightly while the average claim roughly doubled. This jump may reflect the change to Iowa law in 2000 which allowed firms to use the alternative incremental research credit calculation method. The jump may also reflect an increased use of the supplemental RACs awarded by DED as part of business incentive packages. Accounting for the effect of inflation does little to change the story regarding both average and total credit claims, therefore all remaining analysis will consider only nominal claim amounts.

Figure 1 also includes counts of individual income tax claims made in the 2002 through 2005 tax years. The information available for historical RAC claims by individual taxpayers is limited because any RAC claim was lumped with all other refundable credit claims on the "other refundable credits" line on the individual income tax return (IA 1040). This differs from the corporate income tax return (IA 1120) which had a separate line for an RAC claim through tax year 2005.⁷ Prior to tax year 2006, the only way to discern whether an individual claimed the RAC is if the taxpayer filed either the IA 128 form for claims of the regular credit, or the IA 128A for claims of the alternative incremental credit. Traditionally information from these forms has not been captured electronically. However, as part of the Tax Credits Tracking and Analysis System, begun at the Iowa Department of Revenue during fiscal year 2006, information from these forms was captured for tax returns filed for tax years 2002 and later. The total amount of individual RAC claims has been rising steadily over time while the average RAC has remained relatively flat (see Figure 3). It is not clear whether these results reflect actual trends in claims or are a result of limited data capture. While the count of individual claims is nearly double the count of corporate claims, the total dollar value of individual claims is just 3 to 6 percent of the corporate total. Individual claims will be discussed in more detail below.

B. Corporate Claims by Size, Frequency, and Industry

Because the majority of RAC dollars are claimed by corporations, the data evaluation begins with a focus on corporate claims. While over one-third of all corporate RAC claims have been made by firms with less than 100 employees, over three-fourths of total RAC dollars have been received by firms employing more than 500 (see Table 7). Firm size is measured as the maximum quarterly number of employees reported to Iowa Workforce Development (IWD) over the 1996 to 2006 period.⁸ Based on that measure, firms are categorized as micro, less than 10 employees; small, 10 to 99; medium, 100 to 499; or large, 500 or more. One-quarter of the firms with RAC claims, accounting for under one-

⁶ Although data on some 2006 tax credit claims are available, data from the most recent tax year are not considered in this analysis because many corporate claims have not yet been filed with the Department of Revenue.

⁷ Starting in tax year 2006, all corporate tax credits other than the motor fuel credit are claimed on the IA 1120 as either refundable or non-refundable. Corporations now provide specific information about credit claims by completing the new IA 148 form, introduced in tax year 2006 to track all Iowa tax credit claims for all types of Iowa taxpayers.

⁸ The IWD data are quarterly files that include monthly employment counts covering calendar years 1996 through 2006. First, monthly employee counts are averaged within quarter for each year, then the maximum quarterly count of employees over the eleven year period is computed. Because all firms are categorized by their maximum size in recent years, firms that experienced significant growth or decline between the time of an RAC claim and the time of their maximum employment could be categorized incorrectly in Table 7.

tenth of the total credits claimed, were unable to be matched to employment counts. For the three-fourths that were matched, the largest number of claims, 917 or 28.9 percent, were made by small firms. These small firms had an average claim of \$17,000. The largest dollar amount of claims, \$202 million or 76.8 percent, were made by large firms, with average RAC claims of \$454,000. These large firms also had the highest number of average claims per firm, 8.9, during the twenty year period. When comparing the RAC value to Iowa gross receipts, the share drops as firm size rises. Although micro and small firms receive a lower average credit amount, \$15,000 and \$17,000, these firms' levels of Iowa gross receipts are disproportionately lower than the medium and large firms such that the ratios of credits to receipts are much higher (at least for those firms reporting Iowa gross receipts on their Iowa tax return). The concentration of RAC dollars going to large firms increases when only claims since 2000 are considered. A possible explanation for the high concentration of the RAC among large firms is that the rules surrounding the credit are too complex and time-consuming for smaller firms, and thus only large firms with in-house tax departments find it practical to claim the credit.

Of the 1,311 firms that have made at least one claim of the Iowa RAC during the past twenty years, 56.7 percent made only one claim while less than one percent made 15 or more claims (see Figure 4). This suggests that most firms did not have ongoing qualified research projects in Iowa. However, looking at the frequency of claims within five-year periods shows an increase in repeat claims during recent years. The share making five RAC claims during a five-year period jumped four fold from 2.9 percent for the 1991 to 1995 period to 13.3 percent for 1996 to 2000 and more than doubled to 29.2 percent for 2001 to 2005 (see Figure 5).

In Iowa, firms with RAC claims have been predominantly in the manufacturing sector, although claims have also been made by firms in the financial and service sector and in agriculture-related sectors. Claims data were matched to North American Industry Classification System (NAICS) codes using IWD data and federal income tax return files. Over 85 percent of firms in the panel were matched to a 3-digit NAICS code and ranked by their total value of RAC claims over the 1986 to 2005 period (see Table 8). Firms in the top twenty industries together account for 60 percent of the total number of claims and 95 percent of the total dollars in claims made on corporate income tax returns since 1986. The industry with the largest RAC claim total is machinery manufacturing. During the last twenty years firms in this industry made 291 claims averaging \$276,000 per claim to total over \$80 million. Individual firms in machinery manufacturing made, on average, nine claims totaling \$1.6 million. These firms are fairly large, averaging 815 employees, and RAC claims were on average 3.7 percent of Iowa gross receipts each year. The industry with the next largest total claims, \$60 million, is computer and electronic product manufacturing. Firms in this industry were larger, with 1,112 average employees. Each firm claimed on average \$2.3 million in RAC since the inception of the Iowa credit, and annually claimed RACs that averaged 58.4 percent of Iowa gross receipts.

Of the top twenty industries with RAC claims, ten were in manufacturing. Manufacturing firms accounted for \$213 million, 80.8 percent, of the total value of credits claimed since 1986, while they accounted for just 35.4 percent of the number of credits claimed. The leading industries change little when the focus shifts to claims made since 2000 (see Table 9). Manufacturing accounts for 51.8 percent of the count and 89.6 percent of the total value of RAC claims made between 2000 and 2005. This reveals that the utilization of the RAC has tilted more towards manufacturing in recent years.

Starting around 2000, DED began to target several industries in the State to encourage the entry of new firms and the expansion or retention of existing firms under the belief that these industries are a good match for the resources available in the State. These targeted industries include Advanced Manufacturing - businesses dedicated to the rapid introduction of new processes, materials and technologies to manufacturing applications; Biosciences - businesses involved in the application of

biological and biochemical sciences to plants, animals, processed foods and humans; and Information Solutions and Financial Services - businesses in the insurance and financial services/ information technology industry. Using six-digit NAICS codes it is possible to identify the share of RAC claims and dollars made by businesses in these targeted industries (see Table 10). Prior to 2000, just 30.0 percent of RAC claims and 45.7 percent of RAC dollars were made by businesses operating in the targeted industries. Since 2000, those shares have risen to 42.5 and 83.1 percent. Over half of the RAC claims by targeted industries are made by firms in the advanced manufacturing sector, which is not surprising given the high concentration of RAC claims in manufacturing industries. This sector also saw a large increase in the share of claims and dollars claimed since 2000. This differs from the bioscience industry which saw an increase in the share of claims following 2000 but a drop in the share of dollars. Claims in the information solutions and financial services industry have not changed much since 2000.

Given the high concentration of RAC claims by firms in manufacturing industries, another question arises as to how concentrated are RAC claims among individual firms. In particular, what share of RAC dollars are claimed by those firms with the ten largest claims in each year? RAC claims by the top ten annual claimants reveal a heavy concentration in claims, particularly since 2000 (see Table 11). While the average share of total corporate RAC claims made by the top ten claimants was 74.1 percent from 1988 through 2005, the concentration increases to 81.6 percent for the 2000 through 2005 period. Part of the shift in concentration could reflect greater use of the supplemental RAC awards by big claimants. The supplemental credit started in 1994 with more recent expansions in 1997 and 2003. Another possible explanation for the increased concentration could be the change to the RAC law in 2000 allowing for claims using the AIRC calculation method in Iowa.

C. Corporate and Individual Claims Detail from IA 128 and IA 128A

Although corporate and individual income tax returns provide data on the tax year and size of a given RAC claim, a more complete evaluation of this tax credit requires information on the calculation method used for a credit claim, the type of research expenditures made in the State against which the claim has been made, whether a claim reflects research expenditures made by the taxpayer or is a flow-through claim, and whether a claim includes a supplemental RAC award. Taxpayers are required to include much of this information on an additional tax form which differs depending on the calculation method used, the IA 128 for the regular method or the IA 128A for the alternative method. As part of the Tax Credits Analysis and Tracking System, the Department of Revenue has collected data from these additional forms, looking back as far as tax year 2002.

The match rate between claims reported on corporate returns, those included in the Department of Revenue electronic database, and the recent data capture from IA 128 and IA 128A paper forms is less than 100 percent because some firms failed to file the additional form or some paper tax returns could not be located. For 2002, 96.5 percent of corporate claims accounting for 96.4 percent of RAC dollars identified on corporate income tax returns have been matched with the corresponding IA 128 or IA 128A (see Table 12). Match rates are similar for 2003 with 96.3 percent of claims and 99.3 percent of dollars matched. The match between the RAC forms and total corporate claims is the best for the 2004 tax year with 99.4 percent of claims and 99.9 percent of dollars matched; for 2005 the match rate falls to 89.5 percent for counts and 96.4 percent for dollars.⁹

An analysis of the IA 128 and IA 128A forms reveals that although less than 11 percent of claims are made using the AIRC, those claims amount to nearly half of the total RAC dollars in each tax year (see Table 12). It follows that the average claims in each tax year under the AIRC are much higher

⁹ Extensive efforts were made to locate all corporate RAC claims for the 2002 through 2004 tax years. Because many 2005 tax returns are still under review by other parts of the Department of Revenue, it was not yet possible to make these same efforts for that tax year.

than the average claims under the regular research credit. When the alternative method for calculating the RAC in Iowa was passed by the legislature, the estimated cost was \$3.0 million for fiscal year 2001 and \$3.1 million for fiscal year 2002. Because the IA 128A does not contain all of the information needed to compute the RAC under the regular method, it is not possible to calculate the realized cost of the law change.

Qualified research expenditures are split into four categories on the IA 128 and IA 128A forms, following the breakdown on the federal research tax credit form (Form 6765).¹⁰ For firms claiming the RAC using the regular method and filing the IA 128, two-thirds of expenditures in Iowa were claimed as wages, slightly higher than the 60.4 percent of total U.S. research expenditures (see Table 13).¹¹ Conversely, only 11.9 percent was attributed toward contract research compared to 17.4 percent of U.S. expenditures. This suggests that businesses undertaking research expenditures in Iowa are more likely to spend those dollars on in-house research. For firms using the AIRC method, the IA 128A form does not require disclosure of total U.S. research expenditures.

In 2004, firms making claims to the Iowa RAC using the regular calculation method and filing form IA 128 claimed over \$10.3 billion in U.S. qualified research expenditures and \$451 million in Iowa qualified research expenditures, 4.4 percent of the U.S. total (see Table 13). Firms using the AIRC calculation method and filing form IA 128A, claimed an additional \$313 million in Iowa qualified research expenditures. Thus a total of \$764 million was spent on research activities in Iowa during the 2004 tax year, for which these firms received \$33 million in research tax credits from the State, or 4.3 cents per dollar spent. Recall that the regular research credit percentage in Iowa is 6.5 percent or 6.5 cents per dollar of qualified expenditures. However, total credit claims should be below 6.5 percent of research expenditures because the RAC is an incremental credit, that is, the credit only applies to expenditures above a base amount. The credit paid per dollar of reported expenditure is also higher here because the numerator includes supplemental credits.¹²

Individual claimants of the RAC are also required to file the IA 128 and IA 128A. With the advent of the IA 148 Tax Credit Schedule in the 2006 tax year, it will be possible to directly identify individual income tax returns with RAC claims and collect data from the IA 128 and IA 128A filed with such claims.¹³ For tax years back to 2002, the Department searched for these forms filed with individual returns indicating any claim for a refundable credit.¹⁴ Although this was likely an incomplete capture of the individual income tax RAC claims, it does provide some information about individuals whom have made claims to the RAC in recent years (see Table 14). Individual taxpayers are eligible for RAC claims directly as business owners or indirectly as shareholders in S-corporations, limited liability

¹⁰ Fifteen of the claims designated as having a match to detailed RAC information did not include an IA 128 but did include a federal research expenditures credit Form 6765. For these firms, an IA 128 was completed using data pulled from the 6765 and the IA 1120. Although it was possible to compute the share of total research expenditures attributed to Iowa based on the available information, it was not possible to determine the Iowa share for each of the specific types of expenditures. Therefore, it was assumed that the Iowa distribution across the four types of research expenditures was the same as reported for total U.S. expenditures.

¹¹ Firms that file an IA 1120 corporate income tax return are usually organized as C-corporations. However, there are a handful of Employee Stock Ownership Plans (ESOP) that filed an IA 1120 for the express purpose of claiming tax credits that were passed-through to the ESOP from the associated business. Those claims are considered in Table 15.

¹² Eliminating the identified supplemental credits paid on 2004 tax year RAC claims from the numerator lowers the credit per dollar of Iowa research expenditures to just 2.9 cents.

¹³ The IA 148 requires taxpayers with any tax credit claim to list the type of claim, the dollar amount of the current year claim, any certificate number if applicable, and details on a pass-through entity where applicable. For non-refundable credits, details on carry forward amounts are also required. Preliminary analysis of the IA 148 for tax year 2006 indicates there were 560 individual claims for the RAC for a total of \$1.8 million. Along with the IA 148, information from the IA 128 and IA 128A was also captured for electronic filers beginning in the 2006 tax year.

¹⁴ For tax years 2002 through 2005, individual income tax returns filed on paper with some positive value on the "other refundable credits" line were examined for the presence of an IA 128 or IA 128A. Electronic returns, used by as many as 60 percent of individual tax filers, did not capture IA 128 or IA 128A data prior to the 2006 tax year.

corporations (LLCs), or partnerships who receive a pass-through of an RAC claim. Many taxpayers filed information for both their individual claim and the corresponding research claim from the associated pass-through business, however, only data from the IA 128 containing the actual claim made on the income tax return are considered here as individual claims (data obtained from forms containing information about the pass-through entity are considered below). On average, 97 percent of RAC claims and 92 percent of RAC dollars claimed by individuals are identified as pass-throughs. The average credit claimed by individual income tax filers, \$5,280 in 2005, is far below the average claim of \$216,000 made by corporations in tax year 2005. This may reflect the smaller size of businesses owned by individuals or the fractured nature of the credit when passed through to shareholders.

As noted above, many of the IA 128 and IA 128A forms filed with individual income tax returns and some filed with corporate income tax returns actually represent the research activities of the pass-through entities from which the taxpayer's claim was generated. A form was identified as representing a pass-through entity when the final credit amount on the IA 128 or IA 128A exceeded the claim reported on the individual or corporate income tax return. These pass-through entities do not file corporate income tax returns, rather any profits, tax liability and tax credits are passed through to the owners or shareholders of the businesses. The pass-through entity research expenditures information was analyzed separately from the data of claimants who were claiming credits for their own activities (see Table 15). The share of wage-related research costs in Iowa and contract research costs in Iowa and the U.S. are higher for the pass-through entities than for the C-corporations (see Table 13). The most significant difference between these pass-through entities and the C-corporations is the share of total research expenditures attributed to Iowa. In 2004, pass-through entities claimed 93.8 percent of total qualified research expenditures were made in Iowa, compared to just 4.4 percent for the C-corporations. This suggests that S-corporations and LLCs doing research are much more likely to heavily concentrate those research activities within Iowa, although there is significant variability in that share across the tax years. It is possible that refundability of the research tax credit in Iowa is encouraging such concentration of efforts within the State.

In addition to the automatic RAC, firms doing research in Iowa can as much as double their claim if awarded a supplemental RAC by the DED as part of business incentive packages.¹⁵ It is possible to identify many of those claims using information collected from the IA 128 and IA 128A forms.^{16,17} Over the 2002 through 2005 period, the share of RAC claim dollars that can be attributed to supplemental claims has risen from 27.7 percent to 36.4 percent (see Table 16). The share of claim counts and total dollars attributed to supplemental claims also differs significantly depending on the method used to calculate the RAC. For firms using the regular calculation method, the share of claims that included a supplemental award rose from 4.9 percent in 2002 to 8.0 percent of claims in 2005. These supplemental credits accounted for just 8.2 percent of RAC dollars in 2002 but rose to 26.9 percent in 2005. In contrast, for firms using the alternative calculation method, 33 to 43 percent of credits included supplemental claims which accounted for nearly 50 percent of the total RAC dollars claimed each tax year. It is not clear why this strong correlation between DED awards and the use of the AIRC exists. It may simply reflect the fact that a handful of firms with large amounts of research

¹⁵ Because supplemental RAC awards require firms to commit to business expansion or job retention programs, the economic impact of dollars awarded under these credits may be significantly different than credits claimed under the non-awarded RAC. In the economic analysis provided in this study, no attempt was made to discern differential impacts between the awarded and non-awarded RAC, this could be a useful avenue for any future analysis of this credit.

¹⁶ Supplemental claims were identified by comparing authors' calculations of the eligible RAC based on reported research expenditures and other credit parameters to the amount of credit actually claimed on the IA 128/IA 128A and the IA 1120.

¹⁷ A few supplemental RAC claims were identified on individual returns and on forms filed on behalf of pass-through entities; however, those claims are not included in the information presented in Table 16.

activities are minimizing their tax liability by applying for business incentive packages and choosing the most beneficial credit calculation method.

DED has provided the Department of Revenue with some information on supplemental RAC awards made during or after fiscal year 2004 including the company name, incentive project type, an estimated amount of the expected supplemental RAC for many awards, and any cap on the supplemental RAC award if applicable. For fiscal year 2004, nine supplemental RAC awards are listed, four under the New Capital Investment Program (NCIP) and five under the New Jobs and Income Program (NJIP). For fiscal year 2005, twelve awards are listed, five under the Enterprise Zone Program (EZ), six under NCIP and one under NJIP. For the fiscal year 2004 awards, five of the nine had estimated RAC claim amounts, where two included dollar caps, for a total of \$14.6 million. For the fiscal year 2005 awards, nine of the twelve had estimated RAC claim amounts, where three included dollar caps, for a total of \$10.9 million. Attempts to match these awards to the claims data from tax returns met with limited success. Eight companies on the DED list were identified as having made RAC claims during the 2003, 2004 or 2005 tax years. Of those claims, only five had IA 128 or IA 128A data collected that allowed for a calculation of the actual supplemental RAC claim. Many of the companies that could not be matched to RAC claims appear to be S-corporations, LLCs or partnerships that would pass through RAC claims to shareholders rather than making a claim on a corporate return. Therefore, it will only be possible to track those claims starting in tax year 2006 using the IA 148.

D. Refundability and Fiscal Timing

As noted above, Iowa is one of only five states that have a refundable RAC. This provision makes the credit much more valuable to firms with research activities in the State. Each year, the State pays out a significant amount of income tax refunds to both corporations and individuals due to RAC claims (see Table 17). Since 2002, the average share of corporate RAC claim dollars paid as refunds has been over 90 percent while for individuals the average share paid as refunds has been 47 percent. Along with receiving a larger share of RAC claims as refunds, around 80 percent of corporate claimants receive some refund of the RAC each tax year compared to just over 20 percent of individual filers. The difference in magnitude between corporate and individual refunds reflects in part the fact that the credit amounts become much smaller as RAC claims are split and passed through to individuals. In addition, individuals reporting income and tax credit claims received as shareholders often report income from other sources and thus have other income tax liability against which the credit can be applied.

One potential explanation for the large refunds received by corporations with RAC claims is the method Iowa uses to compute corporate income tax liability. Under the 100 percent sales apportionment method for assigning corporate income in the State, Iowa corporate tax liability depends solely on the level of sales in the State. Companies with limited sales but extensive research activities in Iowa would face low state income tax liability and qualify for large RACs, and thus would receive large refunds. Indeed, of the top ten refunds paid in each tax year from 1988 through 2005, the average corporate income apportioned to Iowa is just 11.5 percent (see Table 18). From 2002 through 2005, when refunds became an even bigger share of total RAC claims, the apportioned share dropped to just 4.5 percent. Another possible explanation is that these firms are claiming large net operating losses (NOLs) or other tax credits. A handful of firms with 100 percent Iowa apportionment who did receive one of the top ten refunds during the 1989 through 1991 period were able to reduce pre-credit tax liability through net operating losses. However, NOLs do not appear to be a dominant explanation for the big refunds. Likewise, little evidence was found that firms receiving large RAC refunds also had considerable claims under other tax credit programs.

Up to this point, all of the presentation of RAC claims has focused on the tax year in which those claims were made; however, for those interested in state budgeting, knowing claims by tax year only

is not that helpful. In almost all cases, tax credits earned in a given tax year do not impact the state budget until, at the earliest, the following fiscal year. Iowa has a July to June fiscal year while many taxpayers, such as those filing individual income tax returns, have a January to December tax year. Such “calendar year filers” must file state income tax returns by the following April 30. Corporations can have tax years that start at the beginning of any month, thus pushing their tax filing deadline to different months of the following calendar year. In addition, taxpayers are able to receive six-month extensions which further delay the filing of income tax returns. Therefore, it is not surprising that many corporate RAC claims for a given tax year are not filed with the Department of Revenue until two or three fiscal years after the end of the tax year (see Table 19). For the \$37 million of RAC claims filed by corporations in tax year 2005, \$0.5 million were received in fiscal year 2006 (July 2005-June 2006), \$12.7 million were received in fiscal year 2007 (July 2006-June 2007), and \$23.9 million were received in the first half of fiscal year 2008 (July 2007-December 2007). Taking the average distribution of corporate RAC claims over the last six tax years shows just 0.8 percent of claims were filed on returns received in the fiscal year following the tax year, 42.0 percent were received two fiscal years after the tax year, and 57.2 percent were received three fiscal years after the tax year.

VI. Economic Analysis of the RAC in Iowa

As with any tax credit that subsidizes a particular type of expenditure, the Research Activities Tax Credit should promote more spending on research in Iowa by encouraging businesses with anticipated research activities to locate in Iowa or businesses with existing research activities in Iowa to expand those research efforts. A by-product of increased research activities should be the expansion of the State economy. In particular, with more than two-thirds of research expenditures dedicated toward wages, increased research activities should raise the number of high-paying research jobs within the State (see Tables 13 and 15). However, measuring the economic impact of the RAC in Iowa is not a simple task. Unfortunately, little research exists to serve as a model for how to carry out such an analysis. Indeed, Ibele and Vashe (2004) note that they were “not aware of significant or conclusive studies on the impact of state-level R&D tax credits,” (p. 469), Wheeler (2005) asserts “there exists no economic study linking increased expenditures on research and development at the state level to higher employment rates and standards of living,” (p.14), and Paff (2005) claims that “despite the prevalent use of research and development tax credit incentives by the states, the evaluation of this tool’s effectiveness is virtually absent from the literature,” (p. 16).

Two questions that would be useful to answer is whether the RAC in Iowa has increased research activities in the State or increased research-related employment relative to what those outcomes would have been without the credit. Unfortunately, such questions cannot be answered directly because it is not possible to know how businesses would have behaved without the credit. It is possible to compare these outcomes in Iowa to neighboring states which have different specifications for their research tax credits or no tax credit at all. Such a comparison assumes that Iowa is competing for companies’ research expenditures and employment with the six states on its borders. Another reasonable comparison group is states that have similar industrial and employment environments, in particular states that have a large share of employment in manufacturing. As seen above, most of the RAC claims made in Iowa are made by manufacturing companies and thus Iowa is likely competing with other top-manufacturing employment states for the research expenditures carried out by those manufacturers. In 2006, Iowa’s share of total non-farm employment in manufacturing tied with Mississippi as the fifth highest in the nation at 15.4 percent. Indiana (19.0), Wisconsin (17.7), Arkansas (16.6), and South Carolina (16.0) had higher rates and Alabama was close behind with 15.3 percent.

Tables 20 and 21 present summary statistics for the two groups of states, Iowa and its neighbors and Iowa and other top-manufacturing employment states. Data were collected from the National Science

Foundation/Division of Sciences Resources Studies (NSF), the Bureau of Labor Statistics (BLS), and the U.S. Census Bureau. In 2003, four of Iowa's six neighbors also had some form of a research credit (see Table 20). Because the states with some form of RAC have larger average gross domestic product (GDP) and total population, it is more instructive to consider relative measures of the outcomes of interest which can be found in the bottom three rows in each panel. States with a research tax credit in 2003 report a higher average ratio of industry and academic research expenditures to state GDP than the states without, a slightly higher average scientist and engineer employment share, and a significantly higher average number of patents per scientists and engineers.

The same correlations between the existence of a research tax credit and the outcomes of interest appear for the top-manufacturing employment states (see Table 21). In 2003, four of these states, including Iowa, had some form of a research tax credit.^{18, 19} Top-manufacturing states with a research tax credit in 2003 report a higher average ratio of industry and academic research expenditures to state GDP than the states without, a slightly higher average scientist and engineer employment share, and a significantly higher average number of patents per scientists and engineers.

Of course positive correlations do not prove causality. Attempts to determine causality were hampered by the limited availability of data and limited variability in the existence of RACs in states over time. NSF data on state-level research expenditures, scientist and engineer employment and awarded patents are available intermittently starting in 1993. All of the data is available for all of the states of interest in 1995, 1999 and 2003. Although this covers a span of nine years, just one state, South Carolina, introduced an RAC within the time covered by the panel. Six other states had RACs before 1993, Arkansas introduced an RAC in 2003, Nebraska introduced an RAC in 2006, and Alabama, Mississippi, and South Dakota remained without a credit. South Dakota has no corporate or individual income tax, and thus has no reason for such a tax credit.

With such little variability in the existence of the research tax credit, the analysis focuses instead on the variation in the characteristics of the credits across the states. Three characteristics are considered: the credit percentage, the existence of refundability, and the option to claim an alternative incremental research credit (see Table 22). The states with a research tax credit have credit percentages ranging from 5 percent to 10 percent. States with no research tax credit are indicated as having a zero credit percentage. With the small size of the panel, dropping the states without a credit would reduce the degrees of freedom significantly and would almost eliminate variability in the credit percentages given the small variability in the rates across states with a credit and over time. Iowa is the only state in either sample to offer a refundable credit, thus any impact identified with refundability applies only to Iowa. Wisconsin closely followed the federal introduction of the AIRC in 1996, adding the option for the 1998 tax year. Iowa added the AIRC in 2000 and Indiana followed in 2003. The presence of a corporate income tax was also included in the model with the neighbor sample to identify the uniqueness of South Dakota.

Using ordinary least squares, these research tax credit characteristics were regressed against three outcomes of interest for the two samples of Iowa and potentially competing states (see Table 23). The outcomes of interest are the natural log of industry and academic research expenditures, the log of PhD scientists and engineers employed in the state (a proxy for high-quality jobs that result from research expenditures within a state), and the log of patents granted in the state.²⁰ To control for the

¹⁸ Mississippi does have a credit targeted at businesses expanding employment in jobs requiring research and development skills. Although this could encourage research activities, it is not categorized as a research tax credit for this analysis.

¹⁹ Arkansas's research tax credit began in tax year 2003; however, it is reasonable to believe that there exists a lag between the introduction of the credit and any impacts on state research activity. For this analysis, Arkansas is not included as having a credit in tax year 2003.

²⁰ Natural logs were used to allow for a non-linear relationship between the dependent variables and the characteristics of the research tax credits.

size of a state's economy, the log of state non-farm employment and the log of state GDP were included as explanatory variables. The log of personal per capita income was included to control for the standard of living in a state while the share of the state's population aged 25 and older with a college degree was included to account for the education-level of a state's population and to proxy for the presence and size of the state's post-secondary public university system. In the patent equation, the log of PhD scientists and engineers was included to control for the number of high-quality jobs in the state that would be associated with patent applications. Finally, time dummies were included to capture any changes occurring equally across all states over time.²¹

For the sample of neighboring states, the coefficients on the regular research credit percentage are positive and significant for the research expenditures and patents equations (see the top panel of Table 23). This suggests that businesses increase research expenditures in states with positive and higher research tax credit rates.²² However, the coefficients on refundability are negative and insignificant for all specifications; refundability in Iowa does not show up as increasing research expenditures relative to neighboring states. The AIRC coefficient is positive and significant in the patents equation, but negative and insignificant in the others. Total employment and per capita income have positive coefficients suggesting states with larger workforces and higher incomes have more research activity and employment. The education level of the state has a negative coefficient in the research expenditures equation, although the sign flips to positive in the other regressions. The time dummies have negative coefficients suggesting a general downward trend in research expenditures and research-related employment in the Midwest.

For the sample of top-manufacturing employment states, the coefficient on the regular research credit percentage is insignificant across all regressions, with the sign flipping between positive and negative (see the bottom panel of Table 23).²³ This suggests that the existence of the research tax credit or the magnitude of its rate does not strongly influence research expenditures and research-related employment in these states. The coefficient on refundability is positive and significant in the equation looking at employment of scientists and engineers. This may suggest some impact of refundability on research decisions, or it may simply capture the higher-educated population in Iowa relative to this sample of states. Again, the AIRC coefficients are insignificant. The coefficients on total employment are positive, suggesting states with larger workforces have more research activity and employment. The signs on per capita income and education level of the state flip across the regressions, with most insignificant. Unlike with the neighbor sample, the time dummies do not show a strong trend for the top-manufacturing states, with zero values for the research expenditures regression, positive values for the research employment regression, and negative values for the patent regression.

Altogether, the results present conflicting evidence regarding the impact of the research tax credit across these two state-level samples. In particular, refundability in Iowa does not appear to have a strong positive impact on research activity within the State relative to its neighbors or other states with high employment in manufacturing. It is possible that the small sample size of each comparison group is hampering the ability to detect any impact of the credit. A quick test of this possibility was carried out by considering all twelve states, Iowa and Wisconsin are in both samples of seven, in one

²¹ With panel data, the ideal specification would have also included state fixed effects, however, with little variation in the characteristics of the research tax credits, it was not possible to include the variables of interest and a full set of state dummies.

²² Because businesses are only allowed to include 65 percent of contract research in calculating the credit, it is reasonable to think that the research tax credit may have a stronger impact on industry research expenditures rather than the sum of industry and academic research expenditures in the state. A specification was considered with only industry expenditures as the outcome of interest and academic expenditures as an additional explanatory variable. The results were not markedly different from the results in Table 23.

²³ For this sample, the equation with only industry expenditures as the outcome of interest and academic expenditures as an additional explanatory variable resulted in the flipping of signs on the credit percentage and refundability indicator, although all coefficients remained insignificant.

sample (see Table 24). These specifications were unable to detect any effect from the research tax credits on the outcomes of interest; all coefficients on all three research tax credit characteristics are insignificant across all equations. Although twelve states are more than seven, the sample remains relatively small. Additional data collection would be necessary to expand the sample further, which is one potential direction for future research on this credit. However, based on the analysis presented here, it is not possible to conclusively say whether the RAC in Iowa does or does not cause businesses to change their behavior regarding research activities, and in turn benefit the Iowa economy.

VII. Estimated Fiscal Impacts of Potential RAC Changes

The RAC accounted for over 80 percent of the \$45 million in tax credits claimed against the corporate income tax in tax year 2005 (Iowa Department of Revenue, 2007). Department of Revenue corporate and individual tax credit contingent liabilities projections put RAC claims at nearly \$70 million by fiscal year 2012 (Iowa Department of Revenue, 2007). As with any tax credit, changes can be made that will alter its fiscal impact. In this section, estimates of the fiscal impacts of potential RAC changes are presented, keeping in mind that the Department of Revenue is not recommending any of these changes. The options considered were chosen based on a comparison of Iowa's credit to research tax credits offered by other states or the federal credit. All estimates are based on tax year 2004 claims data, the year with the most complete corporate data coverage (see Table 12).²⁴ The fiscal impact estimates are based predominantly on corporate claims which constitute 95 percent of identified RAC claims for the 2004 tax year, although the numbers presented include the estimated impact on individual claims.²⁵ The impacts include only budgetary estimates and do not reflect any estimates of how changes to the RAC could alter taxpayer behavior and economic activity in the State.

As discussed in Section IV, while most states have some version of a research tax credit, the specifications of these credits vary widely across the states. The variations considered in this analysis can be grouped into three broad categories: limits on credit claims, restrictions on refundability, and variations in credit parameters (see Table 25). A fourth category of potential changes unique to Iowa is adjustments to the supplemental RAC.

Many states place limits on the research tax credit either in absolute dollars or in relation to the claimant's tax liability. New Jersey, South Carolina and Texas limit credit claims to 50 percent of current year tax liability. In Iowa, that provision would have reduced the dollar amount of RAC claims in tax year 2004 by \$32.2 million, or 92.5 percent. Massachusetts limits a research credit claim to \$25,000 per tax year while Oregon has a higher limit of \$2 million. In Iowa, a \$25,000 limit on each claim would have reduced claims by 89.2 percent while a \$2 million limit on each claim would have reduced claims by 43.3 percent.

As noted above, Iowa is one of just five states with a refundable research tax credit. If refundability of the Iowa credit was eliminated, the estimated fiscal impact for the 2004 tax year would have been \$31.0 million, reducing the fiscal impact of the credit by 89.0 percent. This estimate assumes no carry

²⁴ Because of the small number of corporate claims and high concentration of dollars claimed, the fiscal impact estimates are subject to a lot of variability based on the underlying data used. A change in the magnitude of one large claim could have a noticeable impact on future results that could not be captured in an estimate based on one year of historical data.

²⁵ When policy options placed limits on the amount of a claim or on the amount of the claim relative to tax liability, it was possible to directly estimate the impact on individuals with the available information. Because most individual claims are reported as pass-throughs, details needed to compute claim amounts when a policy option altered the credit parameters were not available, thus the impact on individual claims was assumed to equal the changes estimated using corporate claim data.

forward is allowed. However, it is likely that many taxpayers with insufficient tax liability in a current tax year and ongoing research activities would not have large tax liability in subsequent years against which to apply any credit carry forward, thus allowing some carry forward period may not greatly increase the fiscal impact of eliminating refundability. Other variations for restricting refunds among the states include annual limits on research credit claims. West Virginia limits refundability of their credit to firms with annual receipts below \$20 million. If such a restriction encompasses total U.S. receipts, limiting refundability to firms with annual receipts below \$20 million would have reduced claims in Iowa by 86.4 percent in tax year 2004. A restriction on refundability based on receipts from Iowa sales only would have reduced claims by a lower 71.0 percent, the difference being large, national firms with a small share of sales within the State. West Virginia also limits refunds to \$100,000 per firm. Considering this as a stand alone restriction in Iowa would have lowered claims by 75.2 percent.

As discussed previously, Iowa has identified a set of industries that it hopes to target for entrance or expansion into the State. For many of these industries, research is an integral part of their operation. If refundability of the RAC was limited to firms that belong to a targeted industry, it is estimated that claims would have been reduced by 7.3 percent. This low impact should not be surprising given the current high concentration of claims within these industries presented in Table 10.

The broadest set of potential changes considered are changes in the rates used to compute the credit.²⁶ For the regular credit, Iowa currently uses a rate of 6.5 percent. If that rate was dropped to 3 percent, the lowest rate identified for a neighboring state, Nebraska, Iowa claims would have fallen by 25.3 percent. Minnesota has a graduated research tax credit, allowing a 5 percent credit on the first \$2 million in qualified research expenditures above the base, and a 2.5 percent credit on QRE's above \$2 million. If Iowa implemented a similar graduated schedule, cutting its 6.5 percent rate in half to 3.25 percent for QRE's above \$2 million, claims would have fallen by 16.3 percent. If Iowa dropped its regular rate to 5 percent, the most common rate used by states, claims would have fallen by 10.6 percent. If instead, Iowa increased its rate to 10 percent, the second most common rate used by other states, claims would have risen by 25.9 percent. If Iowa increased the rate to 20 percent, the federal rate, claims would have risen by 98.5 percent.

Changes could also be made to the rates used under the AIRC method. When Iowa passed the AIRC, the rates chosen were one percentage point below the rates used to compute the federal AIRC. In tax year 2007, the federal AIRC percentages were increased from 2.65, 3.2, and 3.75 percent to 3, 4, and 5 percent. If in tax year 2004, Iowa had increased its AIRC percentages to 2, 3, and 4 percent, total RAC claims would have risen by an estimated 21.4 percent.

Iowa also awards supplemental RAC as part of economic development tax packages. These supplemental credits can as much as double the RAC claim, although DED can cap the supplemental at a lower percentage or a dollar amount. If these supplemental awards were eliminated, claims would have fallen by an estimated 30.7 percent in tax year 2004.²⁷ If the maximum 100 percent increase from a supplemental award was instead lowered to 50 percent, claims would have been reduced by an estimated 14.1 percent.

²⁶ For potential changes where rates are altered, credits were recalculated for each claim using data collected from the IA 128 and IA 128A. Changes to the regular rate were assumed to have no impact on AIRC claims and vice versa. Individual claims and claims for firms where IA 128 or IA 128A data were not available were assumed to change at the same percentage as estimated for the overall change in available corporate claims.

²⁷ For firms where IA 128 or IA 128A data could not be collected and for claims made on individual income tax returns, it was assumed they did not have any awarded supplemental claims.

VIII. Future Work

This study offers a close look at the corporate income tax claims for the Research Activities Tax Credit in Iowa over the twenty years of its existence. Given lack of historical claims data, the analysis of individual income tax claims for RAC was limited to the last four tax years. In the future, data collected from the IA 148, beginning with the 2006 tax year, should allow for a more complete capture and thus better assessment of the RAC claims that are taken against individual income taxes.

The economic analysis section was a first cut at trying to discern any impacts of the RAC on the Iowa economy. The state-level analysis revealed conflicting results depending on the comparison group and the economic impact measure, and thus did not produce any conclusive results about the impact of the credit. It is possible the limited size of the samples considered and the limited variability in the characteristics of the credit hampered the analysis. Comparing Iowa's credit against a larger group of states may provide a better test of these concerns. Hopefully this study will raise discussion and generate ideas for improved analysis that could be carried out in the future.

This study also made no attempt to discern differential impacts between the automatic and supplemental RAC. Recall that the supplemental research tax credit can be awarded as one part of a business incentive package signed with DED which requires firms to commit to start business activity or expand current activity in the State. Because the supplemental credits account for as much as 36 percent of RAC claim dollars each tax year, it would be useful to assess whether the additional dollars provide real incentives to increase research activities in Iowa or research-related employment. Direct contact with firms via surveys or interviews may provide valuable information about the impact of the RAC on the State economy and work force, and in particular, details needed to determine whether the supplemental credit is a useful addition to the incentives offered by DED and administered through the income tax system.

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Tables and Figures

Table 1. Example Calculations of the Federal Regular and Alternative Incremental Research Tax Credits in Tax Year 2006 for an Established Firm: Case Where the Regular Credit is Preferred

Regular Research Credit					
Tax Year	Gross Receipts (Millions \$)		Qualified Research Expenditures (Millions \$)		
1984	\$100		\$5		Fixed-Base Percentage
1985	\$150	Total Gross Receipts	\$8	Total Research	1 4.15% =(\$56)/(\$1,350)
1986	\$250	for 1984-1988	\$12	for 1984-1988	
1987	\$400		\$15		Base Amount
1988	\$450	\$1,350.00	\$16	\$56.00	2 \$64.30 =(\$1,550)*4.15%
2000	\$915		\$50		Research Activities Net the Larger of Base or 50% of Current Activities
2001	\$1,005	Average Gross	\$53		
2002	\$1,215	Receipts for	\$60		3 \$38.70 =\$103 - max(\$64.30,\$103*50%)
2003	\$1,465	Four Previous	\$70		
2004	\$1,615	Years (2002-2005)	\$82		Federal Research Tax Credit (\$ millions)
2005	\$1,905		\$95		
2006	\$2,115	\$1,550.00	\$103		4 \$7.74 =(\$38.70)*20%

Alternative Incremental Research Credit					
Tax Year	Gross Receipts (Millions \$)		Qualified Research Expenditures (Millions \$)		
1984	\$100		\$5		Incremental QREs for 2006
1985	\$150		\$8		1 \$87.50 =\$103 - (\$1,550*1%)
1986	\$250		\$12		\$79.75 =\$103 - (\$1,550*1.5%)
1987	\$400		\$15		\$72.00 =\$103 - (\$1,550*2%)
1988	\$450		\$16		Credit Components
2000	\$915		\$50		2 \$0.21 =(\$87.5 - \$79.75)*2.65%
2001	\$1,005	Average Gross	\$53		\$0.25 =(\$79.75 - \$72.00)*3.2%
2002	\$1,215	Receipts for	\$60		\$2.70 =(\$72.00)*3.75%
2003	\$1,465	Four Previous	\$70		Federal Research Tax Credit (\$ millions)
2004	\$1,615	Years (2002-2005)	\$82		
2005	\$1,905		\$95		3 \$3.15 =(\$0.21 + \$0.25 + \$2.70)
2006	\$2,115	\$1,550.00	\$103		

Source: Authors' calculations.

Table 2. Example Calculations of the Federal Regular and Alternative Incremental Research Tax Credits in Tax Year 2006 for an Established Firm: Case Where the Alternative Incremental Research Credit is Preferred

Regular Research Credit					
Tax Year	Gross Receipts (Millions \$)		Qualified Research Expenditures (Millions \$)		
1984	\$100		\$5		Fixed-Base Percentage
1985	\$150	Total Gross Receipts	\$8	Total Research	1 4.15% =(\$56)/(\$1,350)
1986	\$250	for 1984-1988	\$12	for 1984-1988	
1987	\$400		\$15		Base Amount
1988	\$450	\$1,350.00	\$16	\$56.00	2 \$98.21 =(\$2,367.50)*4.15%
2000	\$915		\$50		Research Activities Net the Larger of Base or 50% of Current Activities
2001	\$1,005	Average Gross	\$53		
2002	\$1,530	Receipts for	\$60	3	\$4.79 = \$103 - max(\$98.21, \$103*50%)
2003	\$2,155	Four Previous	\$70		
2004	\$2,530	Years (2002-2005)	\$82		Federal Research Tax Credit (\$ millions)
2005	\$3,255		\$95		
2006	\$3,780	\$2,367.50	\$103	4	\$0.96 =(\$4.79)*20%

Alternative Incremental Research Credit					
Tax Year	Gross Receipts (Millions \$)		Qualified Research Expenditures (Millions \$)		
1984	\$100		\$5		Incremental QREs for 2006
1985	\$150		\$8	1	\$79.33 = \$103 - (\$2,367.50*1%)
1986	\$250		\$12		\$67.49 = \$103 - (\$2,367.50*1.5%)
1987	\$400		\$15		\$55.65 = \$103 - (\$2,367.50*2%)
1988	\$450		\$16		
2000	\$915		\$50	2	\$0.31 = (\$79.33 - \$67.49)*2.65%
2001	\$1,005	Average Gross	\$53		\$0.38 = (\$67.49 - \$55.65)*3.2%
2002	\$1,530	Receipts for	\$60		\$2.09 = (\$55.65)*3.75%
2003	\$2,155	Four Previous	\$70		
2004	\$2,530	Years (2002-2005)	\$82		Federal Research Tax Credit (\$ millions)
2005	\$3,255		\$95	3	\$2.78 = (\$0.31 + \$0.38 + \$2.09)
2006	\$3,780	\$2,367.50	\$103		

Source: Authors' calculations.

Starting in 2002, this example firm experiences sales growth two and one-half times that of the firm seen in Table 1.

Table 3. Example Calculations of the Iowa Regular and Alternative Incremental Research Tax Credits in Tax Year 2006 for an Established Firm: Case Where the Regular Credit is Preferred

Regular Research Credit						Fixed-Base Percentage
Tax Year	Total Gross Receipts (Millions \$)		Qualified Research Expenditures (Millions \$)			
			Total	Iowa		
					1	4.15% = (\$56)/(\$1,350)
						Base Amount
1984	\$100		\$5.00	\$1.00	Total	
1985	\$150	Total Gross Receipt	\$8.00	\$1.60	Research	2 \$64.30 = (\$1,550)*4.15%
1986	\$250	for 1984-1988	\$12.00	\$2.40	1984-1988	
1987	\$400		\$15.00	\$3.00		Iowa Share of QRE
1988	\$450	\$1,350.00	\$16.00	\$3.20	\$56.00	3 20.000% = (\$20.60)/(\$103)
						Iowa Research Activities Net the Larger of Base or 50% of Current Activities Multiplied by Iowa Share of QRE
2000	\$915		\$50.00	\$10.00		
2001	\$1,005	Average Gross	\$53.00	\$10.60		
2002	\$1,215	Receipts for	\$60.00	\$12.00		
2003	\$1,465	Four Previous	\$70.00	\$14.00	4	\$7.74 = (\$103 - max(\$64.30, \$103*50%))*20.0%
2004	\$1,615	Years (2002-2005)	\$82.00	\$16.40		
2005	\$1,905		\$95.00	\$19.00		Iowa Research Activities Tax Credit (\$ millions)
2006	\$2,115	\$1,550.00	\$103.00	\$20.60	5	\$0.50 = (\$7.74)*6.5%

Alternative Incremental Research Credit						Incremental QREs for 2006
Tax Year	Iowa Gross Receipts (Millions \$)		Qualified Research Expenditures (Millions \$)			
			Total	Iowa		
1984	\$20		\$5.00	\$1.00	1	\$17.50 = \$20.60 - (\$310*1%)
1985	\$30		\$8.00	\$1.60		\$15.95 = \$20.60 - (\$310*1.5%)
1986	\$50		\$12.00	\$2.40		\$14.40 = \$20.60 - (\$310*2%)
1987	\$80		\$15.00	\$3.00		
1988	\$90		\$16.00	\$3.20		Credit Components
					2	\$0.03 = (\$17.50 - \$15.95)*1.65%
2000	\$183		\$50.00	\$10.00		\$0.03 = (\$15.95 - \$14.40)*2.2%
2001	\$201	Average Gross	\$53.00	\$10.60		\$0.40 = (\$14.40)*2.75%
2002	\$243	Receipts for	\$60.00	\$12.00		
2003	\$293	Four Previous	\$70.00	\$14.00		Iowa Research Activities Tax Credit (\$ millions)
2004	\$323	Years (2002-2005)	\$82.00	\$16.40		
2005	\$381		\$95.00	\$19.00	3	\$0.46 = (\$0.03 + \$0.03 + \$0.40)
2006	\$423	\$310.00	\$103.00	\$20.60		

Source: Authors' calculations.

This example firm, the same as seen in Table 1, is assumed to have 20 percent of sales and QREs within Iowa.

Table 4. Example Calculations of the Iowa Regular and Alternative Incremental Research Tax Credits in Tax Year 2006 for an Established Firm: Case Where the Alternative Incremental Research Credit is Preferred

Regular Research Credit					
Tax Year	Total Gross Receipts (Millions \$)		Qualified Research Expenditures (Millions \$)		Fixed-Base Percentage
			Total	Iowa	
					1 4.15% =(\$56)/(\$1,350)
					Base Amount
1984	\$100		\$5.00	\$1.00	Total
1985	\$150		\$8.00	\$1.60	Research 2
1986	\$250	Total Gross Receipts for 1984-1988	\$12.00	\$2.40	\$98.21 =(\$2,367.50)*4.15%
1987	\$400		\$15.00	\$3.00	Iowa Share of QRE
1988	\$450	\$1,350.00	\$16.00	\$3.20	3 20.000% =(\$20.60)/(\$103)
					Iowa Research Activities Net the Larger of Base or 50% of Current Activities Multiplied by Iowa Share of QRE
2000	\$915		\$50.00	\$10.00	
2001	\$1,005	Average Gross Receipts for	\$53.00	\$10.60	
2002	\$1,530	Four Previous	\$60.00	\$12.00	
2003	\$2,155	Years (2002-2005)	\$70.00	\$14.00	4 \$0.96 =(\$103 - max(\$98.21,\$103*50%))*20.0%
2004	\$2,530		\$82.00	\$16.40	
2005	\$3,255		\$95.00	\$19.00	Iowa Research Activities Tax Credit (\$ millions)
2006	\$3,780	\$2,367.50	\$103.00	\$20.60	5 \$0.06 =(\$0.96)*6.5%

Alternative Incremental Research Credit					
Tax Year	Iowa Gross Receipts (Millions \$)		Qualified Research Expenditures (Millions \$)		Incremental QREs for 2006
			Total	Iowa	
1984	\$20		\$5.00	\$1.00	1 \$15.87 = \$20.60 - (\$473.50*1%)
1985	\$30		\$8.00	\$1.60	\$13.50 = \$20.60 - (\$473.50*1.5%)
1986	\$50		\$12.00	\$2.40	\$11.13 = \$20.60 - (\$473.50*2%)
1987	\$80		\$15.00	\$3.00	
1988	\$90		\$16.00	\$3.20	Credit Components
					2 \$0.04 = (\$15.87 - \$13.50)*1.65%
2000	\$183		\$50.00	\$10.00	\$0.05 = (\$13.50 - \$11.13)*2.2%
2001	\$201	Average Gross Receipts for	\$53.00	\$10.60	\$0.31 = (\$11.13)*2.75%
2002	\$306	Four Previous	\$60.00	\$12.00	
2003	\$431	Years (2002-2005)	\$70.00	\$14.00	Iowa Research Activities Tax Credit (\$ millions)
2004	\$506		\$82.00	\$16.40	
2005	\$651		\$95.00	\$19.00	3 \$0.40 = (\$0.04 + \$0.05 + \$0.31)
2006	\$756	\$473.50	\$103.00	\$20.60	

Source: Authors' calculations.

This example firm, the same as seen in Table 2, is assumed to have 20 percent of sales and QREs within Iowa, and, starting in 2002, experiences sales growth two and one-half times that of the firm seen in Table 3.

Table 5. Example Calculations of the Iowa Regular and Alternative Incremental Research Tax Credits in Tax Year 2006 for an Established Firm: Case Where the Alternative Incremental Research Credit is Preferred Due to Low Iowa Sales

Regular Research Credit					
Tax Year	Total Gross Receipts (Millions \$)		Qualified Research Expenditures (Millions \$)		Fixed-Base Percentage
			Total	Iowa	
					1 4.15% =(\$56)/(\$1,350)
					Base Amount
1984	\$100		\$5.00	\$1.00	Total
1985	\$150		\$8.00	\$1.60	Research 2
1986	\$250	Total Gross Receipts for 1984-1988	\$12.00	\$2.40	1984-1988
1987	\$400		\$15.00	\$3.00	Iowa Share of QRE
1988	\$450	\$1,350.00	\$16.00	\$3.20	3 20.000% =(\$20.60)/(\$103)
					Iowa Research Activities Net the Larger of Base or 50% of Current Activities Multiplied by Iowa Share of QRE
2000	\$915		\$50.00	\$10.00	
2001	\$1,005	Average Gross Receipts for	\$53.00	\$10.60	
2002	\$1,530	Four Previous	\$60.00	\$12.00	
2003	\$2,155	Years (2002-2005)	\$70.00	\$14.00	4 \$0.96 =(\$103 - max(\$98.21,\$103*50%))*20.0%
2004	\$2,530		\$82.00	\$16.40	Iowa Research Activities Tax Credit (\$ millions)
2005	\$3,255		\$95.00	\$19.00	
2006	\$3,780	\$2,367.50	\$103.00	\$20.60	5 \$0.06 =(\$0.96)*6.5%

Alternative Incremental Research Credit					
Tax Year	Iowa Gross Receipts (Millions \$)		Qualified Research Expenditures (Millions \$)		Incremental QREs for 2006
			Total	Iowa	
1984	\$5		\$5.00	\$1.00	1 \$19.42 = \$20.60 - (\$118.38*1%)
1985	\$8		\$8.00	\$1.60	\$18.82 = \$20.60 - (\$118.38*1.5%)
1986	\$13		\$12.00	\$2.40	\$18.23 = \$20.60 - (\$118.38*2%)
1987	\$20		\$15.00	\$3.00	Credit Components
1988	\$23		\$16.00	\$3.20	2 \$0.01 = (\$19.42 - \$18.82)*1.65%
					\$0.01 = (\$18.82 - \$18.23)*2.2%
2000	\$46		\$50.00	\$10.00	\$0.50 = (\$18.23)*2.75%
2001	\$50	Average Gross Receipts for	\$53.00	\$10.60	Iowa Research Activities Tax Credit (\$ millions)
2002	\$77	Four Previous	\$60.00	\$12.00	
2003	\$108	Years (2002-2005)	\$70.00	\$14.00	
2004	\$127		\$82.00	\$16.40	3 \$0.52 = (\$0.01 + \$0.01 + \$0.50)
2005	\$163		\$95.00	\$19.00	
2006	\$189	\$118.38	\$103.00	\$20.60	

Source: Authors' calculations.

This example firm is the same as seen in Table 3, with 20 percent of QREs within Iowa, except it is assumed to have only five percent of sales within Iowa.

Table 6. Summary of Research Tax Credits By State

State	Tax Year Effective	Amount of Credit	Refundable Credit	Credit Carry Forward	Additional R&D Credits
Arizona	1993	20% on the first \$2.5 million of incremental research expenses and 11% on incremental research expenses over \$2.5 million.	No	Yes - 15 Years	Allows a credit for construction materials incorporated in R&D facilities and an additional credit of 10% on research conducted at Arizona state universities, which is capped at \$5 million per corporate donor.
Arkansas	2003	20% of qualifying research expenditures.	No	Yes - 3 Years	An eligible business that contracts with one or more Arkansas colleges or universities in performing research may qualify for a 33% income tax credit for qualified research expenditures. This credit may be carried forward for nine years. Other businesses can be granted a 33% credit per year for five years (not to exceed \$50,000 per year) for research in a strategic research area or research through the Arkansas Science and Technology Authority. This credit may be carried forward for nine years. Targeted businesses, which are qualified emerging technology companies, also may be eligible for a 33% credit with a nine-year carryforward or the credits can be sold. The term per financial incentive agreement cannot exceed five years. The business may apply for a renewal of up to five years.
California	1988	24% of basic research costs, 15% of the excess of qualified research expenses over the computed base-period spending.	No	Yes - Until Utilized	Taxpayers are allowed to use the alternative incremental credit calculation method.
Colorado	1989	3% on the excess of qualified expenses over the average of expenditures for the two prior taxable years in an enterprise zone. No more than 1/4 of the allowable credit may be taken in any one tax year and the remaining amount is credited in the succeeding three taxable years.	No	Yes - Until Utilized	None
Connecticut	1993	1% for research and development expenses under \$50 million and increases ratably to 6% where expenses exceed \$200 million. The 6% credit is extended to qualified small businesses with a gross income that does not exceed \$100 million. Those qualified small businesses may exchange unused amounts of this credit with the state for a cash payment of 65% of the value of the credit or carry the amounts forward at full value. Credit refunds are limited to \$1.5 million in any one income year.	No - Other than for the qualified small business provision	Basic Credit Yes - Until Utilized Incremental Credit Yes - 15 Years	An incremental credit is also available which is equal to 20% of the amount spent by the corporation directly on research and experimental expenditures that exceeds the amount spent in the preceding income year. A credit equal to 25% of the incremental increase in amounts spent on research and development by a corporation for a qualifying grant or combination of grants to any institution of higher education in the state for the purposes of research and development related to advancements in technology. A particular expenditure cannot be used for more than one credit.
Delaware	1999	10% on the excess of the firm's qualified research costs in the state over the average of qualified R&D over the immediately preceding four taxable years or 50% of Delaware's apportioned share of the taxpayer's federal R&D tax credit computed under the alternative incremental credit method. The amount of the tax credit claimed cannot exceed 50% of a company's tax liability in any taxable year.	No	Yes - 15 Years	None

Table 6 (continued). Summary of Research Tax Credits By State

State	Tax Year Effective	Amount of Credit	Refundable Credit	Credit Carry Forward	Additional R&D Credits
Georgia	1998	10% on qualified research expenses in excess of a computed base amount. The computed base amount is determined by multiplying the company's Georgia taxable income by either the average of the company's aggregate qualified research expenses attributable to Georgia for the preceding three taxable years, or 30%, whichever is less. The credit taken in any taxable year cannot exceed 50% of the company's remaining Georgia net income tax liability after all other credits have been applied.	No	Yes - 10 Years	None
Hawaii	2001	20% of incremental research spending.	Yes	No	None
Idaho	2001	5% of expenditures related to qualified research conducted in Idaho.	No	Yes - 14 Years	None
Illinois	1990	6.5% on the excess of qualified research costs over the average amount of qualifying expenditures for the three prior taxable years.	No	Yes - 5 Years	None
Indiana	1984	10% of qualified research expenses (5% prior to 2003) in excess of the taxpayer's base period spending.	No	Yes - 10 Years	In 2008, the rate of the credit increases to 15% for the first \$1 million of incremental research expenses. After the first \$1 million, the rate is 10% of incremental research expenses. Taxpayers are allowed to use the alternative incremental credit calculation method.
Iowa	1985	6.5% of the excess of qualified research expenses during the tax year over a computed base amount of expenditures using the state's apportioned share of research expenses.	Yes	No	Taxpayers are allowed to use the alternative incremental credit calculation method. A supplemental research activities credit which can as much as double the amount of the credit is available to companies who qualify through Department of Economic Development programs.
Kansas	2001	6.5% of the excess of research and development expenses in the current year over the average of the current and past two years. The amount of credit taken in any one year may not exceed 25% of the credit generated in a given year. Thus the credit is taken over a period of at least 4 years.	No	Yes - 99 Years	For businesses engaged in bioscience, including research or production related to bioscience products or processes for specific commercial or public purposes, the state allows companies to seek payments of up to \$1 million from the Kansas Bioscience Authority on up to 50% of net operating losses incurred in the state during the taxable year.
Kentucky	2002	5% of the cost of constructing, remodeling, equipping, or expanding facilities for qualified research.	No	Yes - 10 Years	None
Louisiana	2004	8% of incremental research expenditures if the taxpayer employs 500 or more Louisiana residents or 20% if the taxpayer employs less than 500 residents. Taxpayers with no more than 250 employees may sell the credits.	Yes	Yes - 10 Years	Also offers an income tax credit to promote R&D for qualified medical concerns and a credit on donations for biomedical and biotechnological R&D in higher educational institutions in the state. A tax exemption is also offered on qualified concerns engaged in research, development, manufacturing, support or service located in a university R&D park or operated in association with a public and regionally accredited university in the state.

Table 6 (continued). Summary of Research Tax Credits By State

State	Tax Year Effective	Amount of Credit	Refundable Credit	Credit Carry Forward	Additional R&D Credits
Maine	1996	5% of the excess qualified research expenses over the average qualified expenses for the three prior taxable years, along with 7.5% of basic research payments as defined under IRC section 41. The credit may be used against 100% of the first \$25,000 of tax due before the allowance of any credits, plus 75% of taxes in excess of \$25,000.	No	Yes - 15 Years	A taxpayer qualifying for the research expense tax credit may take an additional credit if the amount spent on qualified research expenses by the taxpayer exceeds 150% of the base amount (the average amount spent on qualified research expenses in the 3 preceding years).
Maryland	2000	3% of qualified expenses is the basic credit rate. If the total amount of the credit claimed by all businesses in the state exceeds \$3 million then the credit is prorated among eligible companies. If any funds remain below the \$3 million incremental credit cap, they may be used as additional funds for the basic credit.	No	Yes - 7 Years	The incremental credit is equal to 10% of research expenses in excess of average qualified research and development expenses over the Maryland base amount of R&D expenses. If the total amount of the credit claimed by all businesses in the state exceeds \$3 million then the credit is prorated among eligible companies. Together, the state R&D credits cannot exceed a total of \$6 million.
Massachusetts	1991	10% of any excess qualified research expenses for the taxable year over the computed base amount, plus 15% of the basic research payments determined under IRC section 41. The credit may be used against the first \$25,000 in tax liability and 75% of any liability over \$25,000. Credits that exceed this limitation, but do not exceed 100% of the tax, are converted to unlimited carryforward status.	No	Yes - 15 Years	None
Michigan	2008	1.9% of in-state research and development, but limited to 75% of total tax liability.	No	No	None
Minnesota	1981	5% of the first \$2 million of the excess of qualified research expenses for the year over a computed base amount. The amount of the credit is 2.5% for qualified expenses over \$2 million.	No	Yes - 15 Years	Items used or consumed for R&D activities that are considered part of the production process are exempt from sales and use tax.
Mississippi	NA	None	NA	NA	For businesses creating jobs that require R&D skills from professionals such as chemists and engineers, the credit is equal to \$1,000 for each net new full-time employee for the first five years and is limited in aggregate to 50% of the taxpayer's state corporate income tax liability in a taxable year.
Missouri	1994-2004	None	NA	NA	Prior to January 1, 2005 the credit was equal to 6.5% of the excess of qualified research expenses during the tax year over the average amount of qualified research expenses incurred in Missouri during the preceding three tax years. The credit expired on January 1, 2005.
Montana	1999	5% on the excess of qualified research expenses during the year, over a computed base amount of research expenses and on basic research payments. The calculated base-period amount is determined consistent with the federal definition under IRC section 41 using Montana-sourced items.	No	Yes - 15 Years (also can be carried back two years)	None

Table 6 (continued). Summary of Research Tax Credits By State

State	Tax Year Effective	Amount of Credit	Refundable Credit	Credit Carry Forward	Additional R&D Credits
Nebraska	2006	3% on R&D expenses in excess of the computed base amount. The base amount is the average expenditures incurred in the state for the two tax years immediately preceding the first year the credit is claimed.	Yes	No	Credit can also be used to obtain a refund of state sales and use taxes paid.
New Jersey	1994	10% on incremental research expenses in addition to a 10% credit on basic research payments. The amount of the tax credit applied during a taxable year may not exceed 50% of a company's tax liability otherwise due.	No	Yes - 7 Years	None
New Mexico	2005	Equal to the annual sum of all state gross receipts taxes, compensation taxes and personal income tax withholding due to the state or payable by the taxpayer. The credit is available to qualified small R&D businesses, which are defined as a business entity that employed no more than 25 employees on a full-time-equivalent basis and had total revenues of no more than \$5 million in any prior fiscal year. The credit is effective from July 1, 2005 through June 2009.	No	NA	None
New York	2005	9% of qualified research expenses paid or incurred by the taxpayer in the taxable year. The credit is capped at \$250,000 per eligible taxpayer per year and a taxpayer is limited to claiming these credits for four consecutive tax taxable years, unless the taxpayer is located in an academic incubator facility and relocates within New York State to a nonacademic incubator site.	Yes	No	Research and development property acquired by the taxpayer by purchase and placed in service during the taxable year is eligible for an 18% credit. A taxpayer may also claim a 100% credit for qualified high technology training expenditures paid or incurred by the taxpayer, up to \$4,000 per employee per taxable year. These credits are also limited to being claimed for four consecutive years.
North Carolina	1996	1% for research and development expenses under \$50 million, 2% for expenses between \$50 million and \$200 million and 3% for expenses of more than \$200 million. If a taxpayer is a small business (receipts of \$1 million or less), or the research is performed in an economically distressed area of the state, then the applicable credit is 3%	No	Yes - 15 Years	A taxpayer may take a credit up to 15% for any North Carolina university research expenses.
North Dakota	1988	8% on the first \$1.5 million of qualified research expenses in excess of the computed base amount and 4% for qualified expenses over \$1.5 million.	No	Yes - 15 Years	The credit can also be carried back three taxable years.
Ohio	2001	7% of qualified research expenses over the average of qualified expenses for the three prior taxable years.	No	Yes - 7 Years	A nonrefundable credit, not to exceed \$150,000, equal to a taxpayer's qualified R&D loan payments made during the calendar year immediately prior to the tax period in which the credit is claimed. Also available is a nonrefundable credit equal to 25% of the investments made in small, Ohio-based companies engaged in R&D.

Table 6 (continued). Summary of Research Tax Credits By State

State	Tax Year Effective	Amount of Credit	Refundable Credit	Credit Carry Forward	Additional R&D Credits
Oklahoma	NA	None	NA	NA	Allows an income tax credit for businesses with a net increase in the number of full-time equivalent employees engaged in computer services, data processing or R&D in the state. The credit is equal to \$500 for each new employee and is limited to a maximum of 50 new employees. An additional credit is available for donations made to an independent biomedical research institute.
Oregon	1989	5% of qualified research expenses incurred on research conducted within the state. Each credit claim is limited to \$2 million per year.	No	Yes - 5 Years	An alternative credit equal to 5% of qualified research expenditures in excess of 10% of Oregon sales is also allowed. The alternative credit is limited to \$10,000 multiplied by the number of percentage points by which qualified research expenses exceed 10% of Oregon sales. An alternative credit claim may not exceed \$2 million.
Pennsylvania	1997	10% on the excess of the current year's qualified R&D costs over the prior year's research expenses. The credit for small businesses is equal to 20%.	No	Yes - 15 Years	None
Rhode Island	1994	22.5% of the first \$25,000 in incremental research expenses and 16.9% above \$25,000. The maximum credit claimed during any tax year cannot exceed 50% of an entity's tax liability due for the year.	No	Yes - 7 Years	A property tax credit equal to 10% on property used in a research facility.
South Carolina	2001	5% on qualified research expenses, consistent with IRC section 41, incurred in the state. The annual credit is capped at 50% of a taxpayer's state tax liability net of all other applied credits.	No	Yes - 10 Years	None
Texas	2001	5% on the sum of the excess of qualified research expenses incurred in Texas over the computed base amount and basic research payments as determined under IRC section 41. The credit is limited to 50% of the company's total tax liability before any other credits.	No	Yes - 20 Years	Taxpayers are allowed to use the alternative method for computing the incremental credit under IRC section 41, provided that a federal election was made.
Utah	1999	6% on incremental research expenses incurred in the state.	No	Yes - 14 Years	A credit equal to 6% of expenditures on machinery used in research.
Vermont	1998	10% of qualified Research and Development expenses as defined in IRC section 41. The credit may be granted for up to five years. Companies qualifying as Sustainable Technology Companies may qualify for a 30% credit rather than the 10% credit.	No	Yes - 5 Years	None

Table 6 (continued). Summary of Research Tax Credits By State

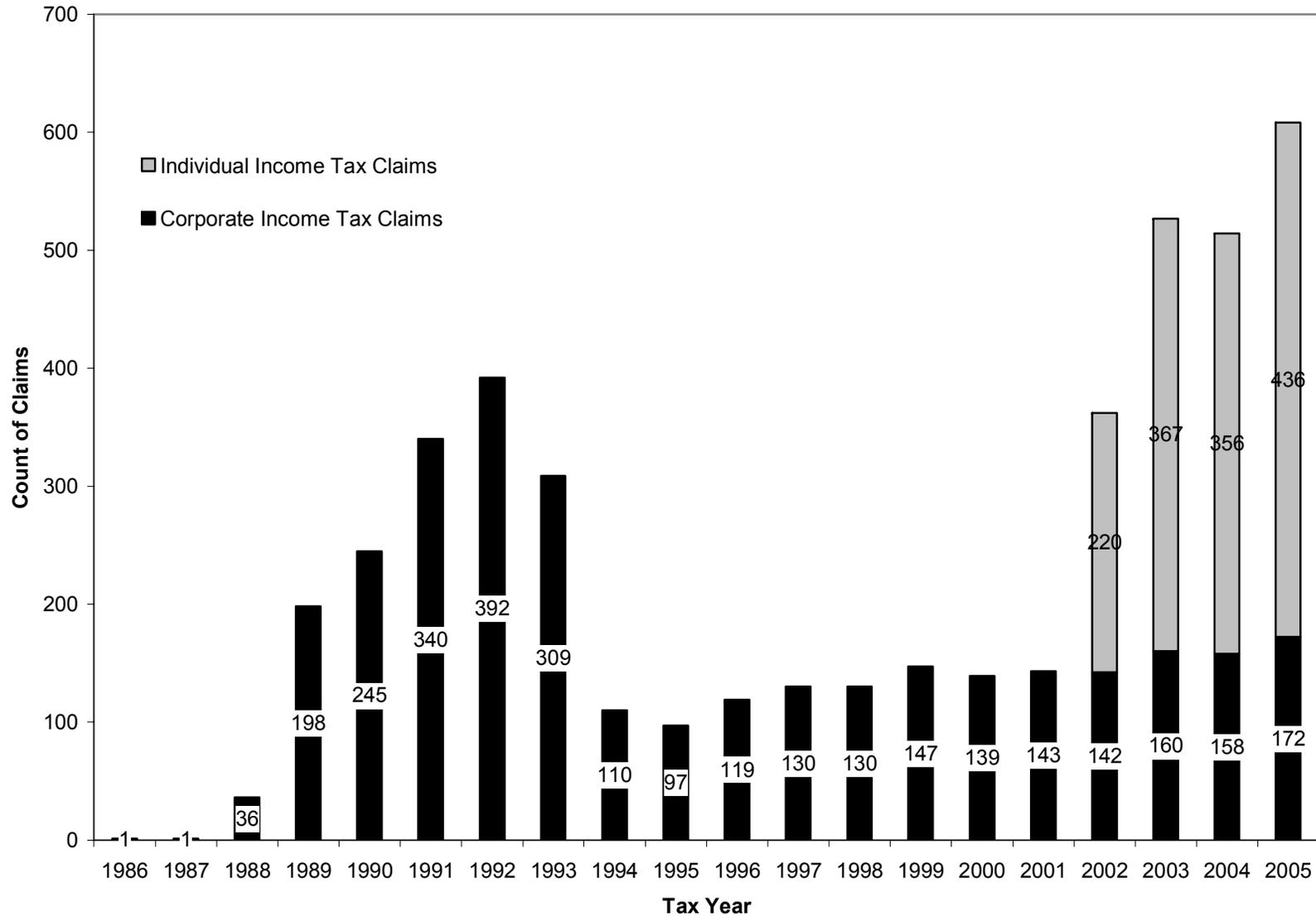
State	Tax Year Effective	Amount of Credit	Refundable Credit	Credit Carry Forward	Additional R&D Credits
Washington	2004	The greater of the taxpayer's average tax rate or statutory rate ranging from 0.75% to 1.50% (depending on the calendar year when the credit is being claimed) multiplied by qualified research expenses in excess of 0.92% of taxable income. To qualify, a company's employees must perform qualified research activities in an R&D project and must complete an annual survey by March 31 following the year in which the credit was taken. The amount of the credit cannot exceed the lesser of \$2 million or the amount of tax otherwise due for the calendar year.	No	No	None
West Virginia	2003	The greater of 3% of qualified research expenses or 10% of the excess annual qualified expenditure over a three-year base period. The credit is refundable for companies with annual gross receipts of less than \$20 million and annual payroll of less than \$2.5 million.	No - Other than for the small business provision	Yes - 10 Years	There is an economic opportunity tax credit available for job creation in high-tech research zones or parks.
Wisconsin	1986	5% (10% in a development zone prior to 1998) of research and development expenses over the base amount (as defined in IRC section 41), plus 5% of qualifying expenditures on tangible depreciable research facility property.	No	Yes - 15 Years	Taxpayers are allowed to use the alternative method for computing the incremental credit under IRC section 41.

Sources: The CPA Journal Online, www.nysscpa.org/cpajournal/2007/207/essentials/p40.htm and TaxCreditResearch.com, <http://www.taxcreditresearch.com/>.

Outlaw Consulting, accessed December 14, 2007.

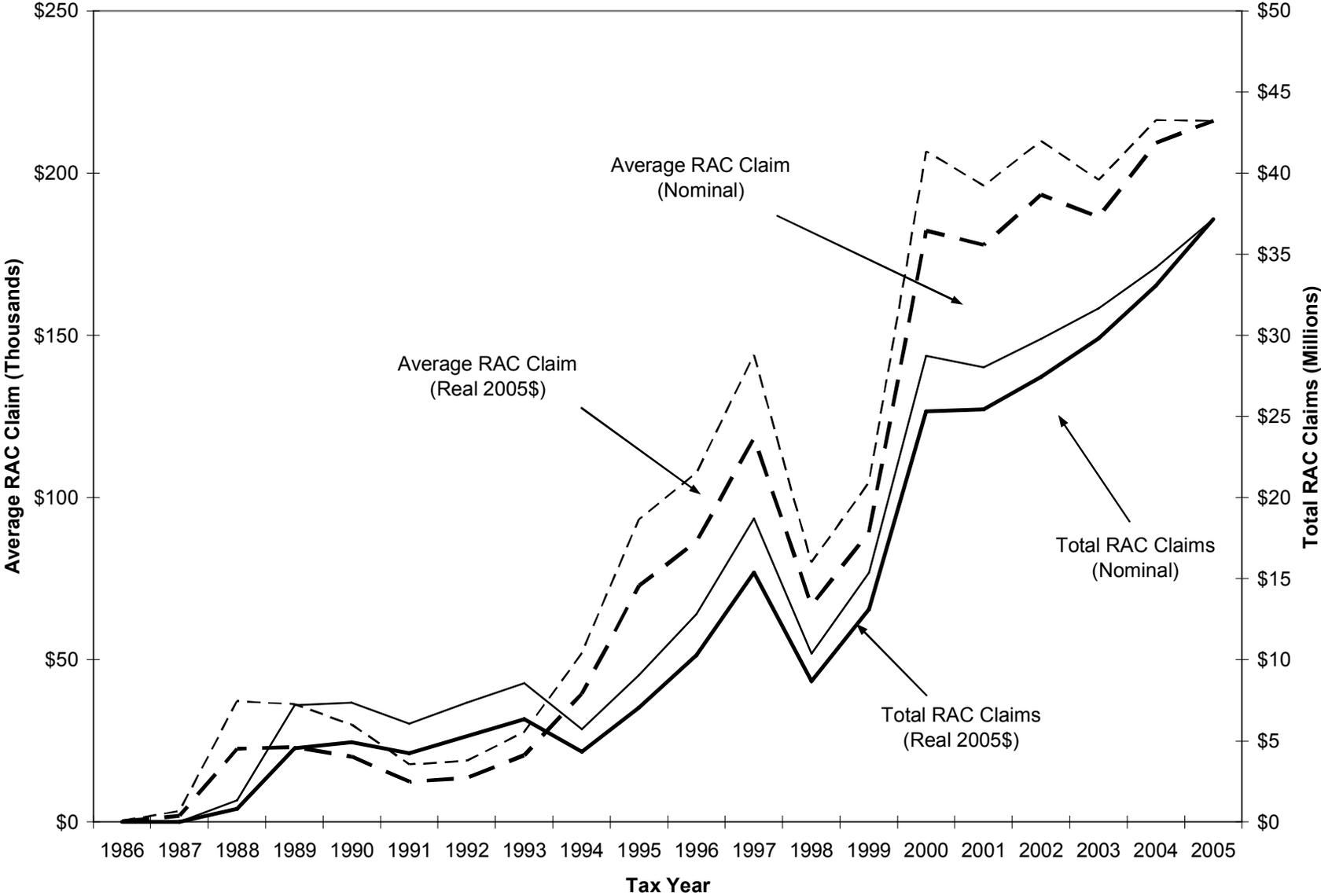
NA=Not applicable

Figure 1. Count of Corporate and Individual Research Activities Tax Credit Claims for Tax Years 1986 through 2005



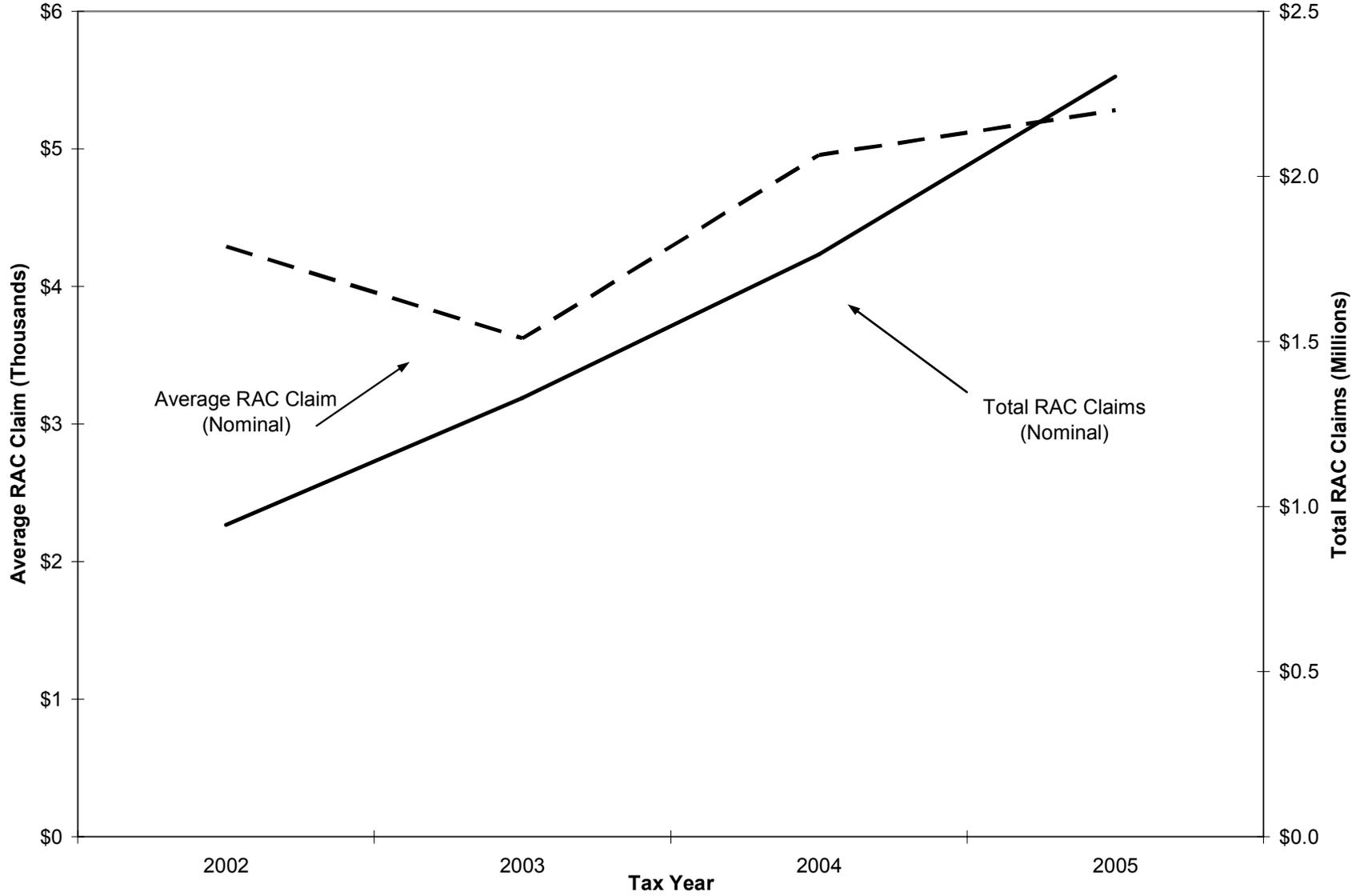
Source: Iowa corporate and individual income tax returns, where data collection on individual claims began with the 2002 tax year.

Figure 2. Average and Total Corporate Research Activities Tax Credit Claims (Including Supplemental Awards) for Tax Years 1986 through 2005



Source: Iowa corporate income tax returns

Figure 3. Average and Total Individual Research Activities Tax Credit Claims for Tax Years 2002 through 2005



Source: Iowa individual income tax returns, where data collection on individual claims began with the 2002 tax year.

Table 7. Corporate Research Activities Tax Credit Claims by Employment Size

Group by Employment Count	Number of Claims	Percent of Claims	Number of Firms	Average Claims per Firm	Total RAC Claims	Percent of Total	Average RAC Claim	Average Employment per Firm	Average RAC Share of Iowa Gross Receipts ¹
1986-2005									
Micro (<10)	308	9.7%	170	3.6	\$4,568,733	1.7%	\$14,834	4	132.0%
Small (10-99)	917	28.9%	381	5.2	\$15,484,065	5.9%	\$16,886	46	10.7%
Medium (100-499)	709	22.4%	197	7.3	\$23,666,752	9.0%	\$33,380	223	13.5%
Large (500+)	446	14.1%	87	8.9	\$202,291,031	76.8%	\$453,567	2,287	5.1%
Unknown	789	24.9%	476	3.0	\$17,312,838	6.6%	\$21,943	--	2.7%
Total	3,169		1,311		\$263,323,418		\$83,094		
2000-2005									
Group by Employment Count	Number of Claims	Percent of Claims	Number of Firms	Average Claims per Firm	Total RAC Claims	Percent of Total	Average RAC Claim	Average Employment per Firm	Average RAC Share of Iowa Gross Receipts ¹
Micro (<10)	72	7.9%	28	3.7	\$2,442,547	1.4%	\$33,924	4	192.3%
Small (10-99)	306	33.5%	92	4.4	\$7,574,302	4.2%	\$24,753	46	11.6%
Medium (100-499)	213	23.3%	62	4.5	\$8,743,068	4.9%	\$41,047	230	7.3%
Large (500+)	192	21.0%	47	5.0	\$152,819,210	85.7%	\$795,933	2,048	3.6%
Unknown	131	14.3%	47	3.9	\$6,708,417	3.8%	\$51,209	--	2.7%
Total	914		276		\$178,287,544		\$195,063		

Source: Iowa corporate income tax returns matched to Iowa Workforce Development employment count data. All claims are reported in nominal dollars.

1. Data on Iowa gross receipts are not always available, therefore averages represent less than one-third of tax year observations for some groups.

Figure 4. Count of Corporate Research Activities Tax Credit Claims by Firms During Tax Years 1986 through 2005

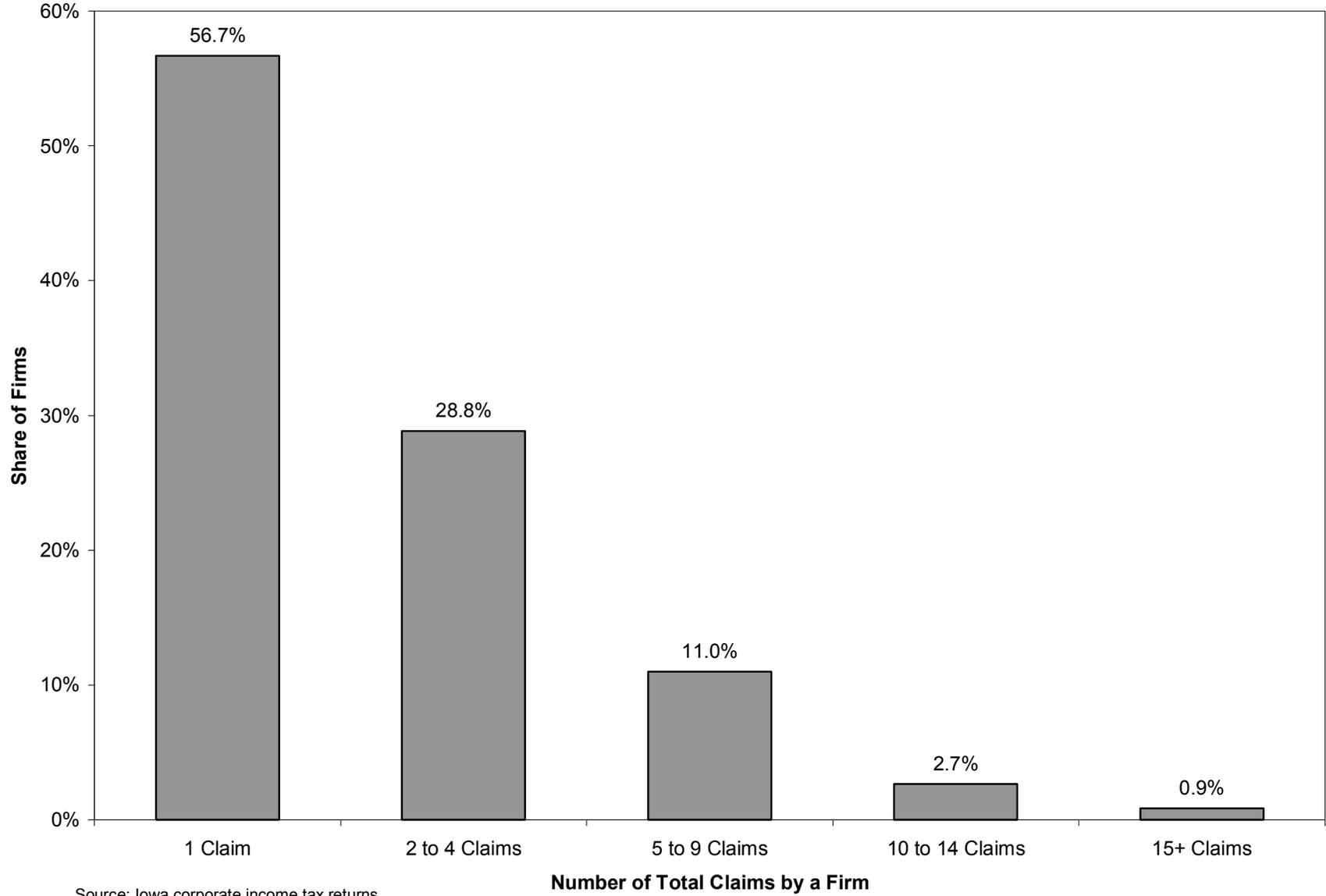


Figure 5. Count of Corporate Research Activities Tax Credit Claims by Firms During Five-Year Periods

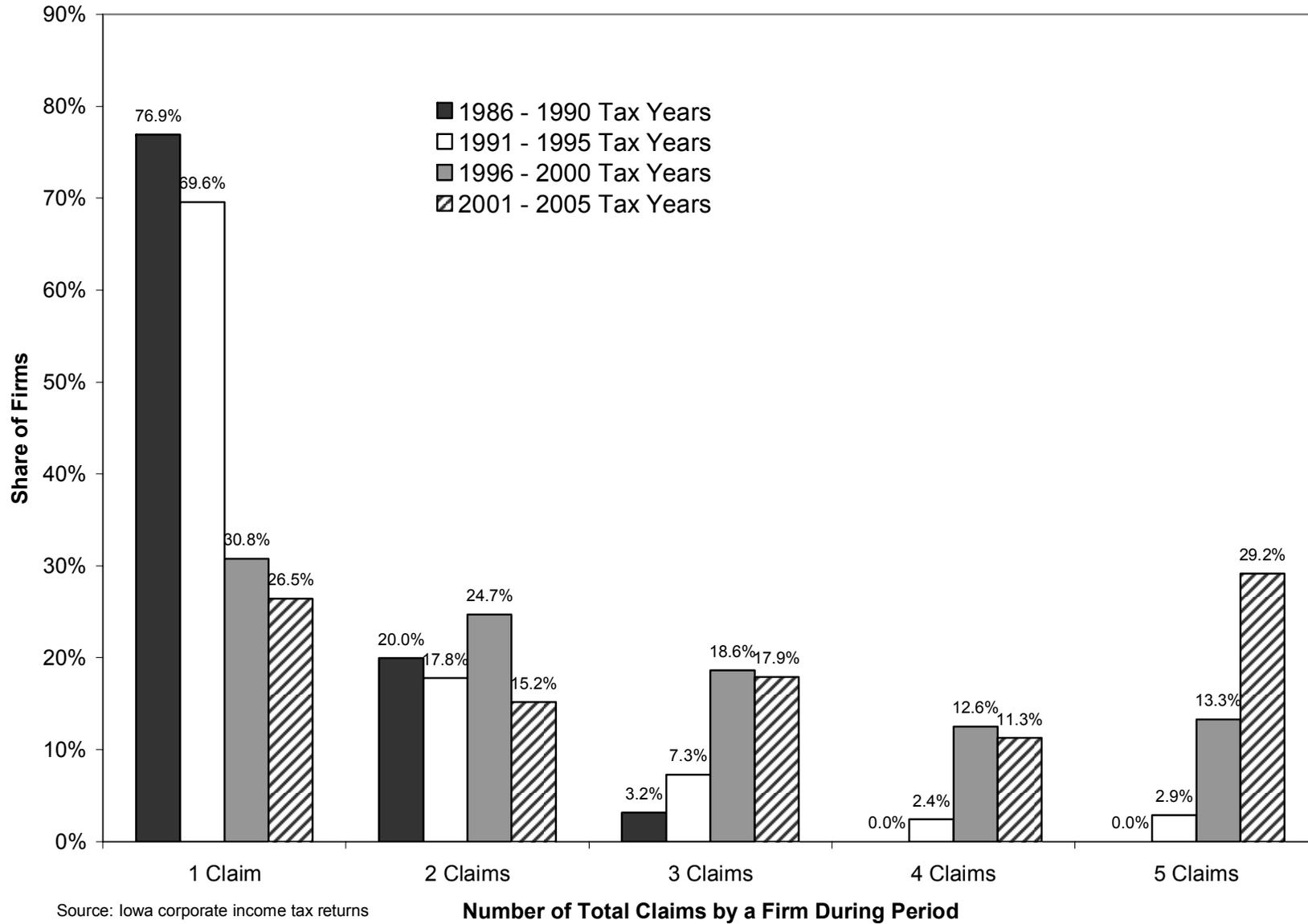


Table 8. Corporate Research Activities Tax Credit Claims by Top Twenty Industries for Tax Years 1986 through 2005

Industry Classification	Number of Claims	Percent of Claims	Total RAC Claims	Percent of Total	Average RAC Claim	Average Count of Firm Claims in Period	Average Firm Total RAC Claims in Period	Average Employment per Firm	Average RAC Share of Iowa Gross Receipts ¹
1 Machinery Manufacturing	291	9.2%	\$80,244,823	30.5%	\$275,755	8.9	\$1,637,649	815	3.7%
2 Computer and Electronic Product Manufacturing	130	4.1%	\$60,228,539	22.9%	\$463,296	7.8	\$2,316,482	1,112	58.4%
3 Chemical Manufacturing	172	5.4%	\$35,372,866	13.4%	\$205,656	9.6	\$1,219,754	327	6.1%
4 Electrical Equipment, Appliance, and Component Manufacturing	54	1.7%	\$11,030,621	4.2%	\$204,271	8.4	\$1,002,784	2,519	6.0%
5 Credit Intermediation and Related Activities	39	1.2%	\$8,434,995	3.2%	\$216,282	6.3	\$766,818	265	4.7%
6 Food Manufacturing	173	5.5%	\$8,433,303	3.2%	\$48,747	9.3	\$234,258	1,133	0.8%
7 Support Activities for Agriculture and Forestry	14	0.4%	\$8,069,468	3.1%	\$576,391	8.9	\$2,017,367	2,371	4.6%
8 Transportation Equipment Manufacturing	108	3.4%	\$7,958,221	3.0%	\$73,687	6.0	\$306,085	504	14.6%
9 Management of Companies and Enterprises	111	3.5%	\$4,666,719	1.8%	\$42,043	7.2	\$141,416	219	21.0%
10 Plastics and Rubber Products Manufacturing	82	2.6%	\$3,476,092	1.3%	\$42,391	7.4	\$173,805	329	4.5%
11 Furniture and Related Product Manufacturing	22	0.7%	\$3,417,883	1.3%	\$155,358	8.4	\$683,577	1,486	1.3%
12 Professional, Scientific, and Technical Services	193	6.1%	\$3,117,739	1.2%	\$16,154	5.4	\$48,715	57	56.7%
13 Merchant Wholesalers, Nondurable Goods	183	5.8%	\$2,650,957	1.0%	\$14,486	7.0	\$42,757	137	69.3%
14 Utilities	22	0.7%	\$2,515,056	1.0%	\$114,321	12.4	\$628,764	635	0.0%
15 Merchant Wholesalers, Durable Goods	82	2.6%	\$2,333,004	0.9%	\$28,451	4.5	\$50,717	84	1.8%
16 Administrative and Support Services	32	1.0%	\$1,884,367	0.7%	\$58,886	2.8	\$110,845	806	0.2%
17 Fabricated Metal Product Manufacturing	77	2.4%	\$1,697,401	0.6%	\$22,044	6.1	\$51,436	457	0.6%
18 Internet Service Providers, Web Search Portals, and Data Processing Services	10	0.3%	\$1,229,536	0.5%	\$122,954	3.9	\$307,384	2,230	0.5%
19 Crop Production	88	2.8%	\$1,031,516	0.4%	\$11,722	3.1	\$15,869	57	1.3%
20 Wood Product Manufacturing	12	0.4%	\$951,742	0.4%	\$79,312	3.7	\$158,624	3,237	0.5%
Unknown Industry	470	14.8%	\$8,160,352	3.1%	\$17,362	2.3	\$26,668	--	2.8%
Manufacturing	1,121	35.4%	\$212,811,491	80.8%	\$189,841	7.5			
All Other Industries	1,244	39.2%	\$44,093,709	16.7%	\$35,445	5.8			

Source: Iowa corporate income tax returns matched to Iowa Workforce Development employment count data. All claims are reported in nominal dollars.

1. Data on Iowa gross receipts are not always available, therefore averages represent less than one-third of tax year observations for some groups.

Table 9. Corporate Research Activities Tax Credit Claims by Top Twenty Industries for Tax Years 2000 through 2005

Industry Classification	Number of Claims	Percent of Claims	Total RAC Claims	Percent of Total	Average RAC Claim	Average Employment
1 Machinery Manufacturing	125	13.2%	\$64,279,237	36.1%	\$514,234	868
2 Computer and Electronic Product Manufacturing	59	6.2%	\$43,053,359	24.2%	\$729,718	1,100
3 Chemical Manufacturing	63	6.7%	\$29,500,473	16.6%	\$468,261	486
4 Electrical Equipment, Appliance, and Component Manufacturing	20	2.0%	\$7,717,904	4.3%	\$406,205	2,555
5 Transportation Equipment Manufacturing	63	6.7%	\$5,666,622	3.2%	\$89,946	529
6 Credit Intermediation and Related Activities	17	1.8%	\$3,786,129	2.1%	\$222,713	290
7 Food Manufacturing	66	7.0%	\$3,388,950	1.9%	\$51,348	1,034
8 Management of Companies and Enterprises	54	5.7%	\$3,176,633	1.8%	\$58,827	301
9 Furniture and Related Product Manufacturing	16	1.7%	\$2,792,824	1.6%	\$174,552	1,082
10 Professional, Scientific, and Technical Services	87	9.2%	\$1,950,662	1.1%	\$22,421	57
11 Plastics and Rubber Products Manufacturing	28	3.0%	\$1,928,271	1.1%	\$68,867	343
12 Merchant Wholesalers, Nondurable Goods	65	6.9%	\$1,495,870	0.8%	\$23,013	194
13 Fabricated Metal Product Manufacturing	26	2.7%	\$1,119,537	0.6%	\$43,059	497
14 Utilities	9	1.0%	\$1,034,414	0.6%	\$114,935	1,054
15 Merchant Wholesalers, Durable Goods	20	2.1%	\$1,013,950	0.6%	\$50,698	137
16 Crop Production	10	1.1%	\$683,854	0.4%	\$68,385	131
17 Internet Service Providers, Web Search Portals, and Data Processing Services	4	0.4%	\$492,454	0.3%	\$123,114	3,224
18 Animal Production	18	1.9%	\$440,679	0.2%	\$24,482	165
19 Publishing Industries	15	1.6%	\$288,294	0.2%	\$19,220	42
20 Miscellaneous Manufacturing	25	2.6%	\$248,851	0.1%	\$9,954	136
Unknown Industry	41	4.3%	\$3,398,136	1.9%	\$82,881	--
Manufacturing	491	51.8%	\$159,696,028	89.6%	\$325,246	
All Other Industries	340	35.9%	\$17,761,075	10.0%	\$52,238	

Source: Iowa corporate income tax returns matched to Iowa Workforce Development employment count data. All claims are reported in nominal dollars.

Table 10. Corporate Research Activities Tax Credit Claims by Firms in Iowa's Targeted Industries for Tax Years 1988 through 2005

Tax Year	All Targeted Industries		Advanced Manufacturing		Biosciences		Information Solutions and Financial Services	
	Share of Claims	Share of Dollars	Share of Claims	Share of Dollars	Share of Claims	Share of Dollars	Share of Claims	Share of Dollars
1988	36.1%	72.6%	16.7%	8.7%	16.7%	62.8%	2.8%	1.1%
1989	17.2%	46.5%	9.1%	28.5%	5.1%	16.6%	3.0%	1.4%
1990	14.7%	32.8%	6.9%	27.8%	4.1%	4.1%	3.7%	0.9%
1991	10.3%	32.1%	4.7%	21.1%	3.2%	9.9%	2.4%	1.1%
1992	11.7%	24.4%	6.6%	13.1%	2.3%	10.5%	2.8%	0.8%
1993	19.1%	20.7%	12.3%	12.0%	3.2%	7.8%	3.6%	0.9%
1994	40.0%	45.6%	27.3%	27.6%	8.2%	16.7%	4.5%	1.4%
1995	38.1%	45.9%	26.8%	28.3%	7.2%	17.2%	4.1%	0.4%
1996	42.9%	44.2%	28.6%	26.3%	5.0%	16.1%	9.2%	1.8%
1997	46.9%	80.8%	28.5%	54.2%	8.5%	24.0%	10.0%	2.6%
1998	42.3%	58.8%	24.6%	39.4%	8.5%	7.6%	9.2%	11.8%
1999	40.8%	44.3%	23.8%	33.3%	8.2%	3.2%	8.8%	7.7%
1988-99	30.0%	45.7%	18.0%	26.7%	6.7%	16.4%	5.3%	2.7%
2000	44.6%	73.8%	27.3%	68.3%	10.1%	2.3%	7.2%	3.2%
2001	41.3%	83.2%	26.6%	76.6%	11.2%	4.0%	3.5%	2.5%
2002	40.1%	80.1%	26.5%	76.4%	10.2%	2.2%	3.4%	1.5%
2003	42.2%	83.5%	28.6%	79.0%	9.3%	2.4%	4.3%	2.2%
2004	44.6%	88.7%	31.2%	84.1%	8.9%	3.1%	4.5%	1.5%
2005	42.4%	89.4%	30.0%	85.0%	8.8%	3.8%	3.5%	0.7%
2000-05	42.5%	83.1%	28.4%	78.2%	9.8%	2.9%	4.4%	1.9%

Source: Iowa corporate income tax returns. Targeted industries are identified using 6-digit NAICS codes provided by DED. DED began explicit targeting of these industries starting around 2000.

**Table 11. Concentration of Corporate Research Activities Tax Credit Claims
for Tax Years 1988 through 2005**

Tax Year	Total Claims	Total of Top Ten Claims	Top Ten Claim Share
1988	\$812,260	\$741,901	91.3%
1989	\$4,567,844	\$3,148,393	68.9%
1990	\$4,919,218	\$3,168,094	64.4%
1991	\$4,225,222	\$2,178,256	51.6%
1992	\$5,295,811	\$3,211,655	60.6%
1993	\$6,342,955	\$4,032,148	63.6%
1994	\$4,339,005	\$3,168,589	73.0%
1995	\$7,062,596	\$5,819,255	82.4%
1996	\$10,292,564	\$8,063,959	78.3%
1997	\$15,387,073	\$11,586,750	75.3%
1998	\$8,675,488	\$5,524,582	63.7%
1999	\$13,113,618	\$9,389,614	71.6%
2000	\$25,336,056	\$20,653,515	81.5%
2001	\$25,428,365	\$20,514,858	80.7%
2002	\$27,453,582	\$22,169,111	80.8%
2003	\$29,831,296	\$23,351,737	78.3%
2004	\$33,066,688	\$27,463,724	83.1%
2005	\$37,171,557	\$31,628,035	85.1%
Average			
1988-2005	\$14,628,955	\$11,434,121	74.1%
2000-2005	\$29,714,591	\$24,296,830	81.6%

Source: Iowa corporate income tax returns.

Table 12. Research Activities Tax Credit Information from Forms IA 128 and IA 128A, Corporate Income Tax Filers for Tax Years 2002 through 2005

Tax Year	Regular Research Credit Claims Filed on Form IA 128			AIRC Claims Filed on Form IA 128A			AIRC Share		Match Rates Between IA 128 and 128A Forms and IA 1120 Corporate Claims		
	Claims	Average	Total	Claims	Average	Total	Claims	Total	Claims	Average	Total
2002	122	\$109,484	\$13,357,106	15	\$873,864	\$13,107,957	10.9%	49.5%	96.5%	99.9%	96.4%
2003	140	\$111,088	\$15,552,328	14	\$1,005,590	\$14,078,264	9.1%	47.5%	96.3%	100.0%	99.3%
2004	141	\$122,735	\$17,305,680	16	\$982,105	\$15,713,684	10.2%	47.6%	99.4%	100.0%	99.9%
2005	138	\$140,217	\$19,350,002	16	\$1,029,311	\$16,468,979	10.4%	46.0%	89.5%	100.0%	96.4%
Total	541		\$65,565,116	61		\$59,368,884					

Source: Iowa 128 and 128A tax forms filed with corporate income tax returns. All claims are reported in nominal dollars.

Table 13. Research Activities Tax Credit Information from Forms IA 128 and IA 128A, C-Corporation Research Expenditure Shares by Tax Type for Tax Years 2002 through 2005

Distribution of Iowa Research Expenditures Reported on Form IA 128 for 2002-2005				Tax Year	Total Reported Qualified Research Expenditures			All RAC Claims	
Wages	Supplies	Computers	Contract		Form IA 128	Form IA 128A			
66.8%	21.2%	0.0%	11.9%		Total U.S.	Total IA	IA Share of U.S.	Total IA	Total IA
				2002	\$5,087,848,620	\$399,464,687	7.9%	\$264,513,822	\$663,978,509
				2003	\$5,469,938,830	\$461,302,875	8.4%	\$280,016,474	\$741,319,349
				2004	\$10,258,389,562	\$451,156,115	4.4%	\$313,333,854	\$764,489,969
				2005	\$11,375,417,677	\$461,757,183	4.1%	\$330,850,265	\$792,607,448
				Total	\$32,191,594,689	\$1,773,680,860	5.5%	\$1,188,714,415	\$2,962,395,275
Distribution of U.S. Research Expenditures Reported on Form IA 128 for 2002-2005									
60.4%	22.3%	0.0%	17.4%						

Distribution of Iowa Research Expenditures Reported on Form IA 128A for 2002-2005				Tax Year	RAC Claims per Dollar of Iowa Research Expenditures		
Wages	Supplies	Computers	Contract		Form IA 128	Form IA 128A	All RAC Claims
67.3%	24.3%	0.2%	8.2%	2002	\$0.033	\$0.050	\$0.040
				2003	\$0.034	\$0.050	\$0.040
				2004	\$0.038	\$0.050	\$0.043
				2005	\$0.042	\$0.050	\$0.045
				Total	\$0.037	\$0.050	\$0.042

Source: Iowa 128 and 128A tax forms filed with corporate income tax returns. All claims are reported in nominal dollars.

Table 14. Research Activities Tax Credit Information from Forms IA 128 and IA 128A, Individual Income Tax Filers for Tax Years 2002 through 2005

Tax Year	Identified Claims			Earned vs. Pass-Through			
	Claims	Average	Total	Distribution of Claims		Pass-Through Share	
				Earned	Pass-Through	Claims ¹	Total Dollars
2002	220	\$4,291	\$943,961	\$103,117	\$840,844	96.4%	89.1%
2003	367	\$3,622	\$1,329,220	\$154,453	\$1,174,767	96.7%	88.4%
2004	356	\$4,955	\$1,763,952	\$108,265	\$1,655,687	96.6%	93.9%
2005	436	\$5,280	\$2,302,023	\$99,552	\$2,202,471	97.7%	95.7%
Total	943		\$6,339,156	\$465,387	\$5,873,769		

Source: Iowa 128 and 128A tax forms filed with individual income tax returns.

All claims are reported in nominal dollars.

1. The share of pass-through claims represents the share of identified individual claims where the entire claim amount was designated as a pass-through.

Table 15. Research Activities Tax Credit Information from Forms IA 128 and IA 128A, S-Corporation or LLC Research Expenditure Shares by Tax Type for Tax Years 2002 through 2005

Distribution of Iowa Research Expenditures Reported on Form IA 128				Tax Year	Total Reported Qualified Research Expenditures			All RAC Claims
Wages	Supplies	Computers	Contract		Form IA 128	Form IA 128A	IA Share of U.S.	
75.6%	8.1%	0.0%	16.3%		Total U.S.	Total IA	Total IA	Total IA
				2002	\$16,991,524	\$14,473,761	\$3,318,021	\$17,791,782
				2003	\$73,322,022	\$26,760,620	\$3,897,749	\$30,658,369
				2004	\$18,630,259	\$17,476,020	\$7,726,863	\$25,202,883
				2005	\$27,239,833	\$26,001,667	\$4,074,695	\$30,076,362
55.6%	10.4%	0.0%	33.9%	Total	\$136,183,638	\$84,712,068	\$19,017,328	\$103,729,396

Distribution of Iowa Research Expenditures Reported on Form IA 128A				Tax Year	RAC Claims per Dollar of Iowa Research Expenditures		
Wages	Supplies	Computers	Contract		Form IA 128	Form IA 128A	All RAC Claims
70.0%	20.1%	0.2%	9.7%	2002	\$0.036	\$0.018	\$0.033
				2003	\$0.038	\$0.018	\$0.036
				2004	\$0.036	\$0.008	\$0.028
				2005	\$0.034	\$0.016	\$0.032
				Total	\$0.036	\$0.017	\$0.033

Source: Iowa 128 and 128A forms filed with individual and corporate income tax returns. Data from IA 128 and 128A forms was identified as representing pass-through entities based on non-matches to credit claim amounts on the taxpayer's income tax return. All claims are reported in nominal dollars.

Table 16. Corporate Supplemental Research Activities Tax Credit Claims Identified Using Forms IA 128 and IA 128A for Tax Years 2002 through 2005

Tax Year	All Research Activities Tax Credit Claims Filed on Forms IA 128 and IA 128A						
	RAC Count	Total RAC Claims	Supplemental Count	Supplemental RAC Claims	Non-Awarded RAC Claims	Supplemental Counts	Supplemental Claims Share RAC Claims
2002	137	\$26,465,063	11	\$7,333,853	\$19,131,210	8.0%	27.7%
2003	154	\$29,630,592	14	\$8,111,073	\$21,519,519	9.1%	27.4%
2004	157	\$33,019,364	18	\$10,698,863	\$22,320,501	11.5%	32.4%
2005	154	\$35,818,981	17	\$13,038,402	\$22,780,579	11.0%	36.4%

Tax Year	Regular Research Credit Claims Filed on Form IA 128						
	RAC Count	Total RAC Claims	Supplemental Count	Supplemental RAC Claims	Non-Awarded RAC Claims	Supplemental Counts	Supplemental Claims Share RAC Claims
2002	122	\$13,357,106	6	\$1,098,004	\$12,259,102	4.9%	8.2%
2003	140	\$15,552,328	8	\$1,323,938	\$14,228,390	5.7%	8.5%
2004	141	\$17,305,680	12	\$3,179,054	\$14,126,626	8.5%	18.4%
2005	138	\$19,350,002	11	\$5,196,311	\$14,153,691	8.0%	26.9%

Tax Year	Alternative Incremental Research Credit Claims Filed on Form IA 128A						
	RAC Count	Total RAC Claims	Supplemental Count	Supplemental RAC Claims	Non-Awarded RAC Claims	Supplemental Counts	Supplemental Claims Share RAC Claims
2002	15	\$13,107,957	5	\$6,235,849	\$6,872,108	33.3%	47.6%
2003	14	\$14,078,264	6	\$6,787,135	\$7,291,129	42.9%	48.2%
2004	16	\$15,713,684	6	\$7,519,809	\$8,193,875	37.5%	47.9%
2005	16	\$16,468,979	6	\$7,842,091	\$8,626,888	37.5%	47.6%

Source: Iowa 128 and 128A forms filed with corporate income tax returns, where supplemental claims are identified based on authors' calculations of eligible credits compared to the amount of credits claimed. All claims are reported in nominal dollars.

Table 17. Corporate and Individual Research Activities Tax Credit Claims Paid as Refunds for Tax Years 1988 through 2005

Tax Year	Corporate				Individual			
	Total RAC Claims (Millions \$)	RAC Claims Paid as Refunds (Millions \$)	Refunds as Share of Total RAC Claims	Share of RAC Filers Receiving Some Refund	Total RAC Claims (Millions \$)	RAC Claims Paid as Refunds (Millions \$)	Refunds as Share of Total RAC Claims	Share of RAC Filers Receiving Some Refund
1988	\$0.81	\$0.24	29.0%	38.9%				
1989	\$4.57	\$2.29	50.1%	38.9%				
1990	\$4.92	\$1.97	40.1%	40.4%				
1991	\$4.23	\$1.47	34.8%	37.4%				
1992	\$5.30	\$1.52	28.8%	38.5%				
1993	\$6.34	\$2.09	33.0%	45.0%				
1994	\$4.34	\$1.80	41.5%	64.5%				
1995	\$7.06	\$3.20	45.3%	63.9%				
1996	\$10.29	\$4.65	45.1%	65.5%				
1997	\$15.39	\$7.87	51.2%	62.3%				
1998	\$8.68	\$6.83	78.7%	73.1%				
1999	\$13.11	\$10.23	78.0%	71.4%				
2000	\$25.34	\$22.57	89.1%	73.4%				
2001	\$25.43	\$23.91	94.0%	80.4%				
2002	\$27.45	\$25.73	93.7%	85.2%	\$0.94	\$0.54	56.9%	20.5%
2003	\$29.83	\$28.08	94.1%	81.3%	\$1.33	\$0.58	43.4%	22.3%
2004	\$33.07	\$30.23	91.4%	79.2%	\$1.76	\$0.78	44.0%	20.8%
2005	\$37.17	\$32.84	88.3%	77.9%	\$2.30	\$1.02	44.3%	23.4%
Average								
1988-2005			61.5%	62.1%				
2002-2005			91.9%	80.9%			47.2%	21.7%

Source: Iowa corporate and individual income tax returns, where data collection on individual claims began with the 2002 tax year. All claims are reported in nominal dollars.

**Table 18. Concentration of Corporate Research Activities Tax Credit Refunds
for Tax Years 1988 through 2005**

Tax Year	RAC Claims Paid as Refunds (Millions \$)	Top Ten RAC Refunds (Millions \$)	Top Ten Share of Total RAC Refunds	Top Ten Claimants' Average Iowa Sales Apportionment
1988	\$0.24	\$0.23	99.3%	34.6%
1989	\$2.29	\$2.11	92.1%	51.5%
1990	\$1.97	\$1.77	89.7%	32.4%
1991	\$1.47	\$1.22	83.3%	11.5%
1992	\$1.52	\$1.25	82.0%	9.9%
1993	\$2.09	\$1.59	75.8%	8.6%
1994	\$1.80	\$1.44	79.8%	5.2%
1995	\$3.20	\$2.77	86.5%	2.6%
1996	\$4.65	\$3.89	83.8%	3.9%
1997	\$7.87	\$6.92	87.9%	12.5%
1998	\$6.83	\$4.97	72.8%	3.5%
1999	\$10.23	\$8.21	80.3%	5.7%
2000	\$22.57	\$19.40	86.0%	4.4%
2001	\$23.91	\$19.97	83.5%	3.2%
2002	\$25.73	\$21.70	84.4%	2.5%
2003	\$28.08	\$23.13	82.4%	2.8%
2004	\$30.23	\$26.28	86.9%	9.8%
2005	\$32.84	\$29.73	90.5%	2.8%
<hr/>				
Average				
1988-2005	\$11.53	\$9.81	84.8%	11.5%
2002-2005	\$29.22	\$25.21	86.0%	4.5%

Source: Iowa corporate income tax returns. All claims are reported in nominal dollars.

Table 19. Corporate Research Activities Tax Credit Claims by Tax Year and Fiscal Year

		Total RAC Tax Year Claims by Fiscal Year that Return was Received							
		2001	2002	2003	2004	2005	2006	2007	2008
Tax Year									
2000		\$183,673	\$12,159,955	\$12,976,936	\$15,492	\$0	\$0	\$0	\$0
2001		\$0	\$222,724	\$10,427,640	\$14,767,412	\$10,589	\$0	\$0	\$0
2002		\$0	\$0	\$136,069	\$12,900,652	\$14,401,174	\$0	\$15,687	\$0
2003		\$0	\$0	\$0	\$133,781	\$13,148,719	\$16,534,960	\$13,836	\$0
2004		\$0	\$0	\$0	\$0	\$206,788	\$12,481,011	\$20,378,889	\$0
2005		\$0	\$0	\$0	\$0	\$0	\$524,810	\$12,717,459	\$23,929,288

		Share of Total RAC Tax Year Claims by Fiscal Year that Return was Received							
		2001	2002	2003	2004	2005	2006	2007	2008
Tax Year									
2000		0.7%	48.0%	51.2%	0.1%	0.0%	0.0%	0.0%	0.0%
2001		0.0%	0.9%	41.0%	58.1%	0.0%	0.0%	0.0%	0.0%
2002		0.0%	0.0%	0.5%	47.0%	52.5%	0.0%	0.1%	0.0%
2003		0.0%	0.0%	0.0%	0.4%	44.1%	55.4%	0.0%	0.0%
2004		0.0%	0.0%	0.0%	0.0%	0.6%	37.7%	61.6%	0.0%
2005		0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	34.2%	64.4%

Average Distribution of RAC Tax Year Claims by Fiscal Year that Return was Received						
Fiscal Year =	Tax Year	Tax Year + 1	Tax Year + 2	Tax Year + 3	Tax Year + 4	
	0.0%	0.8%	42.0%	57.2%	0.0%	

Source: Iowa corporate income tax returns and Iowa Department of Revenue returns processing data. All claims are reported in nominal dollars.

Table 20. Characteristics of Iowa and Neighboring States in 2003

States with research tax credit: Illinois, Iowa, Minnesota, Missouri, Wisconsin				
	Mean	Std	Min	Max
GDP (Billions \$)	\$242.43	\$155.68	\$102.21	\$510.30
Population (Millions)	6.37	3.68	2.94	12.65
Total Employment (Millions)	3.07	1.63	1.44	5.81
Per Capita Personal Income	\$31,465	\$2,495	\$29,043	\$34,443
Average Annual Wages	\$35,414	\$4,038	\$30,708	\$40,540
Share of 25+ with College Degree	27.2%	3.5%	24.1%	32.7%
Industry Research Expenditures (Billions \$)	\$3.70	\$3.01	\$0.83	\$8.32
Academic Research Expenditures (Billions \$)	\$0.86	\$0.45	\$0.50	\$1.61
PhD Scientists Employed	10,904	6,257	4,800	21,370
PhD Engineers Employed	1,810	1,270	560	3,950
Patents Received	1,800	1,135	658	3,162
Ratio of Industry and Academic Research Expenditures to State GDP	1.4%	0.6%	0.8%	2.4%
Scientist and Engineer Employment Share	0.4%	0.0%	0.3%	0.4%
Patents per Number of Scientists and Engineers	0.14	0.05	0.07	0.22
States with no research tax credit: Nebraska, South Dakota				
	Mean	Std	Min	Max
GDP (Billions \$)	\$46.02	\$26.31	\$27.42	\$64.63
Population (Millions)	1.25	0.69	0.76	1.74
Total Employment (Millions)	0.65	0.38	0.38	0.91
Per Capita Personal Income	\$29,996	\$1,078	\$29,234	\$30,758
Average Annual Wages	\$28,796	\$2,243	\$27,210	\$30,382
Share of 25+ with College Degree	25.4%	2.1%	23.9%	26.8%
Industry Research Expenditures (Billions \$)	\$0.22	\$0.20	\$0.08	\$0.36
Academic Research Expenditures (Billions \$)	\$0.18	\$0.18	\$0.05	\$0.30
PhD Scientists Employed	1,930	1,146	1,120	2,740
PhD Engineers Employed	195	148	90	300
Patents Received	137	77	82	191
Ratio of Industry and Academic Research Expenditures to State GDP	0.4%	0.2%	0.3%	0.6%
Scientist and Engineer Employment Share	0.3%	0.0%	0.3%	0.3%
Patents per Number of Scientists and Engineers	0.07	0.00	0.06	0.07

Source: National Science Foundation/Division of Sciences Resources Studies, BLS and U.S. Census. Neighboring states include Illinois, Minnesota, Missouri, Nebraska, South Dakota, and Wisconsin.

Table 21. Characteristics of Iowa and Other Top-Manufacturing Employment States in 2003

States with research tax credit: Indiana, Iowa, South Carolina, Wisconsin				
	Mean	Std	Min	Max
GDP (Billions \$)	\$160.36	\$53.95	\$102.21	\$215.43
Population (Millions)	4.69	1.44	2.94	6.20
Total Employment (Millions)	2.23	0.72	1.44	2.90
Per Capita Personal Income	\$28,714	\$1,962	\$26,132	\$30,898
Average Annual Wages	\$32,066	\$1,543	\$30,708	\$33,425
Share of 25+ with College Degree	23.3%	1.2%	22.2%	24.6%
Industry Research Expenditures (Billions \$)	\$2.02	\$1.36	\$0.83	\$3.66
Academic Research Expenditures (Billions \$)	\$0.64	\$0.21	\$0.44	\$0.88
PhD Scientists Employed	6,800	2,092	4,800	8,720
PhD Engineers Employed	1,123	506	560	1,560
Patents Received	1,030	533	524	1,658
Ratio of Industry and Academic Research Expenditures to State GDP	1.6%	0.4%	1.1%	2.0%
Scientist and Engineer Employment Share	0.4%	0.0%	0.3%	0.4%
Patents per Number of Scientists and Engineers	0.12	0.03	0.09	0.16
States with no research tax credit: Alabama, Arkansas, Mississippi				
	Mean	Std	Min	Max
GDP (Billions \$)	\$128.16	\$54.90	\$72.26	\$182.01
Population (Millions)	3.37	0.98	2.73	4.50
Total Employment (Millions)	1.38	0.43	1.11	1.88
Per Capita Personal Income	\$24,692	\$1,486	\$23,448	\$26,338
Average Annual Wages	\$29,573	\$2,396	\$27,591	\$32,236
Share of 25+ with College Degree	19.8%	2.7%	17.4%	22.7%
Industry Research Expenditures (Billions \$)	\$0.76	\$0.43	\$0.27	\$1.02
Academic Research Expenditures (Billions \$)	\$0.36	\$0.19	\$0.18	\$0.56
PhD Scientists Employed	3,753	1,366	2,940	5,330
PhD Engineers Employed	800	543	320	1,390
Patents Received	214	139	132	375
Ratio of Industry and Academic Research Expenditures to State GDP	1.1%	0.8%	0.2%	1.9%
Scientist and Engineer Employment Share	0.3%	0.0%	0.3%	0.4%
Patents per Number of Scientists and Engineers	0.04	0.01	0.04	0.06

Source: National Science Foundation/Division of Sciences Resources Studies, BLS and U.S. Census.

Top-Manufacturing employment states are based on the 2006 share of non-farm employment engaged in manufacturing as reported by Iowa Workforce Development: Indiana (19.0), Wisconsin (17.7), Arkansas (16.6), South Carolina (16.0), Iowa (15.4), Mississippi (15.4), and Alabama (15.3).

Although Arkansas did introduce a research tax credit in 2003, it is assumed the new credit would have little impact on research outcomes in the first year of its existence, so the state is considered to not have a credit for the analysis.

Table 22. Characteristics of Research Tax Credits in States of Interest by Tax Year

State	1995				1999				2003			
	Credit Percentage	Credit Refundable	Allows AIRC	Corporate Income Tax	Credit Percentage	Credit Refundable	Allows AIRC	Corporate Income Tax	Credit Percentage	Credit Refundable	Allows AIRC	Corporate Income Tax
Alabama	0.0%	N	N	Y	0.0%	N	N	Y	0.0%	N	N	Y
Arkansas	0.0%	N	N	Y	0.0%	N	N	Y	0.0%	N	N	Y
Illinois	6.5%	N	N	Y	6.5%	N	N	Y	6.5%	N	N	Y
Indiana	5.0%	N	N	Y	5.0%	N	N	Y	10.0%	N	Y	Y
Iowa	6.5%	Y	N	Y	6.5%	Y	N	Y	6.5%	Y	Y	Y
Minnesota ¹	5.0%	N	N	Y	5.0%	N	N	Y	5.0%	N	N	Y
Mississippi	0.0%	N	N	Y	0.0%	N	N	Y	0.0%	N	N	Y
Missouri	6.5%	N	N	Y	6.5%	N	N	Y	6.5%	N	N	Y
Nebraska	0.0%	N	N	Y	0.0%	N	N	Y	0.0%	N	N	Y
South Carolina	0.0%	N	N	Y	0.0%	N	N	Y	5.0%	N	N	Y
South Dakota	0.0%	N	N	N	0.0%	N	N	N	0.0%	N	N	N
Wisconsin	5.0%	N	N	Y	5.0%	N	Y	Y	5.0%	N	Y	Y

Sources: The CPA Journal Online, www.nysscpa.org/cpajournal/2007/207/essentials/p40.htm and TaxCreditResearch.com, <http://www.taxcreditresearch.com/>.
Outlaw Consulting, accessed December 14, 2007.

Neighboring states include Illinois, Minnesota, Missouri, Nebraska, South Dakota, and Wisconsin.

Top-Manufacturing employment states include Alabama, Arkansas, Indiana, Iowa, Mississippi, South Carolina, and Wisconsin.

1. Minnesota's rate only applies to the first \$2 million in qualified research expenditures, for amounts above \$2 million a 2.5% rate is applied.

Table 23. Impact of Research Tax Credit Characteristics on Research Outcomes Across Neighboring or Top-Manufacturing Employment States

Neighboring States Sample	Dependent Variable					
	Log of Industry and Academic Real Research Expenditures		Log of Scientist and Engineer Employment		Log of Patents	
	Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value
Intercept	-61.04	-4.65	-15.04	-2.58	-102.06	-3.33
Regular Research Credit Percentage	23.96	3.79	4.22	1.47	30.57	2.35
Indicator for Refundability	-0.38	-1.56	-0.08	-0.79	-0.39	-0.86
Indicator for Alternative Incremental Credit	-0.04	-0.36	-0.01	-0.11	0.45	2.26
Indicator for Existence of Corporate Income Tax	0.90	3.33	0.07	0.78	0.48	1.19
Log of Total Employment	3.05	2.27	0.87	6.33	2.00	1.64
Log of Real Per Capita Personal Income	10.40	6.92	1.08	1.43	9.38	2.76
Log of Real GDP	-2.63	-2.34	--	--	--	--
Log of Scientist and Engineer Count	--	--	--	--	-1.95	-1.56
Share Aged 25+ with a College Degree	-4.86	-2.57	1.49	1.55	5.06	1.15
Time Indicator for 1999	-1.52	-7.12	-0.17	-1.54	-1.27	-2.56
Time Indicator for 2003	-1.15	-4.38	-0.21	-1.70	-1.74	-3.07
Adjusted R ²	0.993		0.995		0.961	

Top-Manufacturing Employment States Sample	Dependent Variable					
	Log of Industry and Academic Real Research Expenditures		Log of Scientist and Engineer Employment		Log of Patents	
	Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value
Intercept	-26.23	-1.43	-1.03	-0.26	-50.50	-5.02
Regular Research Credit Percentage	-2.03	-0.42	-1.22	-1.17	3.18	1.14
Indicator for Refundability	0.49	0.90	0.35	2.92	0.19	0.50
Indicator for Alternative Incremental Credit	-0.15	-0.52	0.01	0.14	-0.07	-0.44
Log of Total Employment	2.66	3.27	1.51	9.19	2.22	1.89
Log of Real Per Capita Personal Income	3.03	1.07	-1.25	-2.15	3.00	1.73
Log of Real GDP	-0.78	-1.77	--	--	--	--
Log of Scientist and Engineer Count	--	--	--	--	-0.73	-1.00
Share Aged 25+ with a College Degree	-8.15	-1.31	1.90	1.70	6.31	2.00
Time Indicator for 1999	-0.45	-1.05	0.18	1.93	-0.27	-1.02
Time Indicator for 2003	0.33	0.64	0.27	2.44	-0.56	-1.63
Adjusted R ²	0.874		0.977		0.965	

Notes: A t-value with an absolute value greater than 2.0 denotes statistical significance of the corresponding coefficient at the 5 percent level.

Neighboring states include Illinois, Iowa, Minnesota, Missouri, Nebraska, South Dakota, and Wisconsin.

Top-Manufacturing employment states include Alabama, Arkansas, Indiana, Iowa, Mississippi, South Carolina, and Wisconsin.

Table 24. Impact of Research Tax Credit Characteristics on Research Outcomes Combining Neighboring and Top-Manufacturing Employment States

	Dependent Variable					
	Log of Industry and Academic Real Research Expenditures		Log of Scientist and Engineer Employment		Log of Patents	
	Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value
Intercept	-22.04	-2.55	-7.74	-3.53	-38.43	-3.87
Regular Research Credit Percentage	1.24	0.36	0.15	0.17	2.25	0.69
Indicator for Refundability	0.18	0.74	0.06	0.95	0.34	1.45
Indicator for Alternative Incremental Credit	-0.13	-0.71	-0.02	-0.51	0.24	1.36
Indicator for Existence of Corporate Income Tax	0.70	2.27	-0.05	-0.58	-0.09	-0.30
Log of Total Employment	2.06	5.64	1.08	22.54	2.03	2.52
Log of Real Per Capita Personal Income	2.84	3.01	0.04	0.17	1.97	2.22
Log of Real GDP	-0.61	-1.99	--	--	--	--
Log of Scientist and Engineer Count	--	--	--	--	-0.62	-0.85
Share Aged 25+ with a College Degree	-2.07	-0.85	2.63	4.37	5.45	1.84
Time Indicator for 1999	-0.52	-3.16	-0.02	-0.54	-0.14	-0.87
Time Indicator for 2003	0.01	0.05	-0.03	-0.58	-0.42	-2.52
Adjusted R ²	0.953		0.991		0.949	

Notes: A t-value with an absolute value greater than 2.0 denotes statistical significance of the corresponding coefficient at the 5 percent level. States include Alabama, Arkansas, Illinois, Indiana, Iowa, Minnesota, Mississippi, Missouri, Nebraska, South Carolina, South Dakota, and Wisconsin.

Table 25. Estimated Fiscal Impacts of Potential Research Activities Tax Credit Changes For Tax Year 2004 Claims

	Total RAC Claims	Change from Current Law	Percentage Change from Current Law
Credit Claims Under Current Law	\$34,830,640	--	--
Limits on Credit Claims			
Limit Credit to 50% of Tax Liability	\$2,601,944	-\$32,228,697	-92.5%
Limit Credit to \$25,000 Per Taxpayer	\$3,764,555	-\$31,066,085	-89.2%
Limit Credit to \$2 million Per Taxpayer	\$19,748,219	-\$15,082,421	-43.3%
Restrictions on Refundability			
Eliminate Refundability	\$3,822,334	-\$31,008,306	-89.0%
Refundable Only to Firms with \$20 million or Less in Total Receipts	\$4,744,316	-\$30,086,324	-86.4%
Cap Refund at \$100,000 Per Taxpayer	\$8,621,327	-\$26,209,313	-75.2%
Refundable Only to Firms with \$20 million or Less in Iowa Receipts	\$10,109,167	-\$24,721,473	-71.0%
Eliminate Refundability for Firms Not Identified in one of Iowa's Targeted Industries	\$32,283,944	-\$2,546,696	-7.3%
Variations in Credit Parameters			
Reduce Regular Credit to 3% from 6.5%	\$26,024,698	-\$8,805,942	-25.3%
6.5% on First \$2 million in QRE, 3.25% on QRE above \$2 million	\$29,157,392	-\$5,673,248	-16.3%
Reduce Regular Credit to 5% from 6.5%	\$31,140,049	-\$3,690,591	-10.6%
Raise AIRC to 2%/3%/4% from 1.65%/2.2%/2.75%	\$42,276,646	\$7,446,006	21.4%
Raise Regular Credit to 10% from 6.5%	\$43,844,240	\$9,013,600	25.9%
Raise Regular Credit to 20% from 6.5%	\$69,154,172	\$34,323,532	98.5%
Adjustments to Supplemental RAC			
Eliminate Supplemental RAC	\$24,131,777	-\$10,698,863	-30.7%
Reduce from 100% to 50% Supplemental RAC	\$29,936,429	-\$4,894,211	-14.1%

Notes: Authors' estimates based on tax year 2004 corporate and individual income tax claims using data from forms IA 1120, IA 1040, IA 128, and IA 128A when available. For corporate claims not matched to IA 128 or IA 128A forms, it was assumed the taxpayer claimed the RAC using the regular calculation method and did not qualify for a supplemental claim. For the first seven options, impacts on credits claimed on individual income tax returns were estimated directly. It was assumed no individuals claimed supplemental credits; for the remaining options it was assumed individual claims would be impacted by the same percentage as was estimated using the corporate claims. These fiscal impact estimates are provided for illustrative purposes only. The options presented here are based on variations in research tax credit specifications found in other states. The impacts include only budgetary estimates and do not reflect any estimates of how changes to the credit could alter taxpayer behavior and economic activity in the State.