Iowa Department of REVENUE

Iowa's Innovation Fund Tax Credit

Tax Credits Program Evaluation Study

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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 Program to track tax credit awards and claims. In addition, the Department was directed to assist the legislature by performing periodic economic studies of tax credit programs. This is the first evaluation study completed for the Innovation Fund Tax Credit.

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:

Kristin Hanks-Bents	Iowa Economic Development Authority
Kirk Bjorland	Iowa Innovation Corporation
Matt Busick	River Glen Private Capital
Michael Crum	Iowa State University
Craig Ibsen	Next Level Ventures
John LaMarche	VentureNet Iowa
Chris Sackett	BrownWinick
Bulent Uyar	University of Northern Iowa
Nicolas Ziebarth	University of Iowa

The assistance of an advisory panel implies no responsibility for the content and conclusions of the evaluation study.

This report was also reviewed by Angela Gullickson and Amy Rehder Harris. This study and other evaluations of Iowa tax credits can be found on the Tax Credits Tracking and Analysis Program web page on the Iowa Department of Revenue website.

Table of Contents

Executive Summary

The Innovation Fund Tax Credit (IFTC) is allowed for equity investments made into a qualifying innovation fund certified by the Iowa Economic Development Authority (EDA). A certified innovation fund makes investments in promising early-stage companies that have a principal place of business in the state of Iowa. The intent of the program is to increase the availability of venture capital to Iowa businesses, including but not limited to those businesses engaged in advanced manufacturing, biosciences, and information technology.

The amount of the IFTC is equal to 25 percent of the investment. The credit is nonrefundable which means a claim to the credit is limited to Iowa tax liability. The credit may be transferred to another taxpayer once, and unused credits can be carried forward up to five tax years. The credit can be claimed against corporation income, individual income, franchise, insurance premium, and moneys and credits taxes. No new funds can be certified after June 30, 2018.

This program was preceded by two similar programs intended to expand venture capital in Iowa: the Iowa Fund of Funds Tax Credit Program, which was instituted in 2002 but effectively repealed by 2017, and the Venture Capital Fund Tax Credit, which was instituted in 2002 but repealed in 2010. The IFTC authorizing legislation went into effect on January 1, 2011. Taxpayers were required to wait three years after receiving an award for a qualifying investment to claim the tax credit, and the initial value of the credit was 20 percent of the investment. During the 2013 Legislative session, the tax credit rate was increased from 20 to 25 percent and tax credits can now be claimed in the tax year in which the investment was made. The program has an award cap of $8 million per fiscal year, but only a fraction of that has been utilized in any given fiscal year since the program's inception.

The major findings of the study are:

Equity Investment Tax Credits across the United States

- Thirty-one states have had an equity investment tax credit at one time. Seven states (Hawaii, Maine, Michigan, Minnesota, North Carolina, Oklahoma and Rhode Island) have either allowed their credit to sunset or the tax credit has been repealed.

- The majority of states do not have a credit similar to the IFTC but instead have credits for investments made in qualified companies (i.e. "angel" tax credits). Only Kentucky and North Dakota were found to have a credit similar to IFTC.

- Three of Iowa's neighboring states (Illinois, Nebraska, and Wisconsin) have an equity investment tax credit. In Nebraska, the tax credit is equal to 40 percent of the qualified investment; in the other two states, the tax credit is equal to 25 percent.

- Among active tax credits, the credits in Maryland, Minnesota, Nebraska, and New Jersey are refundable.

- Tax credit program caps vary widely among the states. Vermont has a lifetime program cap of $1.4 million. Most states have an annual cap: Colorado has the lowest cap at $750,000; Massachusetts and New Jersey are tied for the highest cap at $25 million; while North Dakota and Wisconsin have no annual cap.

Literature Review

- Early-stage investment can be further disaggregated into three types, seed, angel, and venture, with the size of typical investments increasing and risk decreasing respectively. Venture capital is often invested by venture firms, which are run by professional managers of others' investment dollars.

- States have recognized that a vibrant startup and venture capital community is likely to lead to job growth; many states have implemented tax credits to promote the development of the entrepreneurial ecosystem in their respective states.

- The key question for policymakers is if the investment would have been made without the tax credit. Reports completed about programs in other states often focus on investment made rather than attempting to determine if the credit leveraged new investment. Most rely on survey data from investors.

- There is some literature which asserts that investment incentive tax credits distort the entrepreneurial market and have deleterious effects on supported firms.

Analysis of Innovation Fund Tax Credit Awards, Claims, and Transfers

- Since inception, there have been 348 Innovation Fund Tax Credit awards totaling $7.0 million. Of this total, 35 awards have been to nonresident individuals or businesses totaling $163,747 (2.3% of the total amount).

- For every year of the program’s existence, total awards have been significantly lower than the statutory cap allowed for the program. FY 2015 had the most awards at $2.8 million, which is $5.2 million under the $8 million annual cap.

- To date, 75 Innovation Fund Tax Credit awards have been transferred totaling $1.4 million. This represents 20.2 percent of the credits awarded.

- To date, 439 Innovation Fund Tax Credit claims have been made totaling $4.9 million. This represents 70.5 percent of the credits awarded. Note that as a nonrefundable tax credit, taxpayers often make multiple partial claims on one award in multiple tax years.

Analysis of Invested Businesses

- Through FY 2017 the Iowa Innovation Fund Tax Credit has incented investment in seven companies.

- As of May 2017, these companies had 230 full-time equivalent employees receiving average wages 86.6 percent higher than the statewide average. From the time immediately prior to investment until May 2017, these seven companies had 136 employees, representing employment growth of 94, or 69.1 percent.

- Most invested companies are in information technology, many are located in central Iowa, and the majority have been in existence for five years or fewer.

State-Level Panel Data Analysis of Investment Incentive Tax Credits

- Panel and traditional regression analyses were performed on state-level data to determine the impact of states' investment incentive tax credits on the number of investment deals, the average size of deals, and numerous growth entrepreneurship metrics.

- The results of the analysis were inconclusive as to whether the existence of an investment incentive tax credit measured using the tax credit rate impacts the number and average size of investments within a state.

- Growth entrepreneurship metrics by state include the average growth rate of startups, the share of startups that advance from small-sized to medium-sized companies, and the density of high growth companies. Regression results showed that the share of scale-ups and the density of high growth companies were affected by the existence of a tax credit measured using the tax credit rate, while the average growth rate of startups was not.

- These results are likely complicated by a number of factors, including the timing of implementation, the nuance of the tax credit structure among states, and exogenous events that obscure the relationship between tax credits and investment.

I. Introduction

At its simplest, venture capital is defined as money invested in a small, early-stage, or expanding firm that is thought to have high growth potential. Given that having ready access to venture funding is often considered essential to business growth, many states have enacted tax credits to promote the growth of early-stage financing, and a few have specifically created programs to promote the development of venture capital firms. This study focuses on the Innovation Fund Tax Credit in Iowa including how it compares to other early-stage financing programs in Iowa and other states. This is followed by an analysis of the impact of innovation fund investments. The study also includes a panel data analysis of venture capital incentive tax credits by state.

Section II of the study describes the Iowa Innovation Fund Tax Credit and other venture capital credits in the state. Section III summarizes other early-stage business assistance programs in Iowa. Section IV provides information about other equity investment tax credits in other states. Section V offers a review of literature on the topic of equity investment tax credits. Section VI presents data regarding Innovation Fund Tax Credit awards, claims, and transfers. Section VII examines the estimated impacts of the Innovation Fund Tax Credit on business survival and growth. Section VIII contains a panel study of the 48 contiguous United States to assess if venture capital credits significantly impact the availability of venture funding in each state. Section IX concludes the study.

II. Iowa Innovation Fund Tax Credit and Other Venture Capital Credits

A. Iowa Innovation Fund Tax Credit

The Iowa Innovation Fund Tax Credit (IFTC) is the primary tax credit in Iowa to promote venture capital investments in the state. This credit is allowed for equity investments made into qualifying innovation funds certified by the Iowa Economic Development Authority (EDA). In turn, these innovation funds make investments into early-stage companies in Iowa. The intent of the program is to increase the availability of venture capital to Iowa businesses. The amount of the tax credit is equal to 25 percent of the investment.

The IFTC has had an annual award cap of $8 million since the program's inception in 2011, with the administration of the program handled by EDA. The initial value of the tax credit was 20 percent of investment. Taxpayers were also required to wait three years after receiving an award for a qualifying investment to claim the tax credit. For example, a taxpayer who made an investment in January 2011 could not claim the tax credit until the 2014 tax year. The requirement was put into place to delay the initial fiscal impact of the tax credit that was enacted during an economic slowdown. In the first two years of the program, no funds were certified and thus no tax credit awards were issued.

During the 2013 Legislative session, the tax credit rate was increased from 20 to 25 percent and the delay for claims was eliminated, allowing for tax credits to be claimed in the tax year in which the investment was made, although the first tax credits could not be issued until September 2014. In 2013, EDA certified the first innovation fund that enabled the first tax credits to be awarded. In order to receive certification, innovation funds must propose to obtain at least $15 million in binding investment commitments and invest the entirety of this capital in companies with a principal place of business in Iowa.

While not a technical requirement for Iowa specifically, the federal Investment Company Act of 1940 also imposes limitations on potential innovation funds. The act states that companies owned by one hundred or more persons are subject to regulation as an investment company, the requirements for which most limited liability companies (LLCs, the most common organization of venture capital firms) cannot meet (15 USC 80a-3(c)(1)). Effectively, this creates the requirements that each fund cannot exceed 99 investors and, to meet the $15 million commitment, each investor in an innovation fund commits at least $151,515 to the fund.

The IFTC is a nonrefundable, transferrable tax credit. Nonrefundable means a claim of the tax credit is limited to Iowa tax liability. Unused tax credits can be carried forward against future tax liability for up to five years. The credit can be claimed against corporation income tax, individual income tax, franchise tax (paid by financial institutions), insurance premium tax, and moneys and credits tax (paid by credit unions). In the case of pass-through entities, the tax credits can be awarded directly to shareholders or awarded to the entity itself and subsequently passed through to shareholders. Each tax credit certificate may be transferred once to any person or entity.

Although the IFTC has an annual award cap of $8 million, there is no taxpayer cap for tax credit awards nor is there a limit on the tax credits awarded through investments in a single innovation fund. In addition, there is no limit on the amount of investment that a single early-stage company can receive through certified innovation funds. In no fiscal year since the inception of the program have awards totaled more than $2.8 million.

The businesses receiving investment from the innovation fund are at the discretion of the innovation fund. The types of businesses include but are not limited to those businesses engaged in advanced manufacturing, biosciences, and information technology.

B. Iowa Angel Investor Tax Credit

The State of Iowa also has one other active tax credit and two inactive credits incentivizing venture capital in Iowa. Besides the IFTC, the other active credit is the Venture Capital Tax Credit – Qualifying Businesses Tax Credit, also referred to as the Angel Investor Tax Credit (AITC). The credit is focused on “angel investors” who make investments directly in start-up companies, and prior to 2015, investments in

community-based seed capital funds. This program went into effect on January 1, 2002. Effective January 2011, the program has an award cap of $2 million per fiscal year and the administration of the credit was moved from the Iowa Capital Investment Board (with assistance from IDR) to EDA. Since 2002, $16.2 million in tax credits have been awarded through the AITC, incenting a total of $64.8 million in investments in Iowa businesses.

Prior to July 1, 2015, an investor could not be awarded tax credits for more than five different investments in five different businesses each year, with each award limited to $50,000. Effective for investments made on or after July 1, 2015, the total amount of tax credits issued to any individual, and the investor's spouse and dependents, is capped at $100,000 per year. The maximum amount of tax credits awarded across all investors for investments in any qualifying business in a year is limited to $500,000. This tax credit program was evaluated in 2014 for the Legislative Tax Expenditure Committee and is scheduled for evaluation again in 2019.

C. Iowa Fund of Funds Tax Credit

The first inactive credit is the Iowa Venture Capital Tax Credit – Iowa Fund of Funds (FF). This tax credit went into effect on January 1, 2002 and is a contingent tax credit allowed for investments made into the Iowa Fund of Funds. Unlike the IFTC or AITC where the tax credits are awarded to an investor at the time of investment, a contingent tax credit means that the FF Tax Credits would only be awarded if the investor does not receive the expected return on their investment. This program was administered by the Iowa Capital Investment Board (ICIB) and IDR.

When the Iowa Fund of Funds Program was enacted, the aggregate tax credit cap was initially set at $100 million, with a restriction that no more than $20 million can be claimed in any year. Effective April 15, 2010, the aggregate tax credit cap was reduced to $60 million; the $20 million annual restriction remained in place. During the 2013 Legislative session, a bill was passed providing for the wind down of the credit including a prohibition on additional fund organization, new investments, and the issuance of new credit certificates. This tax credit program was reviewed in 2012 and 2017 for the Legislative Tax Expenditure Committee.

D. Iowa Venture Capital Funds Tax Credit

The second inactive credit is the Venture Capital Tax Credit – Venture Capital Funds (VC) which was available between January 1, 2002 and June 30, 2010. This tax credit was equal to six percent of equity investments made in venture capital funds that had been certified by the ICIB. Like the AITC, the VC Tax Credit was nonrefundable with a five-year carryforward and could be claimed against corporation income tax, individual income tax, franchise tax, insurance premium tax, and moneys and credits tax. The tax credit had an aggregate tax credit cap of $5 million; just over half of that cap was awarded before its repeal in 2010. During the nine years the VC Tax Credit was in place, a total of 15 venture capital funds received investments totaling $45.4 million.

Some of those funds receiving investments after 2007 were community-based seed capital funds certified under the QBSC Tax Credit which became eligible for the VC Tax Credit once the $10 million cap for the QBSC Tax Credit was exhausted. Because the VC Tax Credit is no longer active, this credit will not be discussed further in this study.

III. Other Assistance for Iowa Early-Stage or Innovative Companies

The Iowa Economic Development Authority also administers four other programs intended for promising early-stage or innovative companies. Each program is structured as a royalty or low interest loan awarded at the discretion of the EDA Board. The four programs are:

- Proof of Commercial Relevance
- Demonstration Fund
- Innovation Acceleration Propel
- Innovation Acceleration Expansion

To be eligible for all four programs, businesses must be in advanced manufacturing, bioscience, or information technology. Companies must also be Iowa-based with fewer than 500 employees.

The Proof of Commercial Relevance (POCR) program is designed to define and articulate the opportunity for businesses that demonstrate a proof-of-concept for innovative technology. The maximum assistance available is $25,000 per award with a 1:2 private to public match required, and applicants must have two co-founders or principals actively engaged in the business. Funds can be used for validation of market potential through beta testing, analyzing market potential, performing competitive analysis, or furthering translational development of a scientific discovery.

The Demonstration Fund (Demo Fund) program is designed to provide assistance to companies with market-ready innovative technologies or products that have a clear potential for commercial viability. The maximum assistance available is $100,000 per award with a 1:2 private to public match required, and an essential management team including business development, financial operations, and technology must be in place. Among other uses, funds can be used for acquiring management or marketing expertise, purchasing equipment, developing and executing marketing strategies, creating marketing materials, validating a business model.

The Innovation Acceleration Fund offers two types of awards: the Propel program and the Innovation Expansion program. The Propel program is intended to accelerate market development for companies that have a management team in place, have a validated business model, and are already generating substantive revenue. The Innovation Expansion program is intended to encourage expansion of product lines in companies that have a complete management infrastructure, a history of profitability, and an established customer base. Propel awards can be up to $300,000 while the

Innovation Expansion maximum is $500,000, and both require a 1:1 private to public match. Funds can be used for a variety of purposes including advanced intellectual property development and evaluation, product focus group research, recruitment and hiring of key personnel, purchasing equipment, or construction costs.

From FY 2008 through the end of FY 2017, these four programs have given 295 awards totaling $36.0 million. The funding total includes POCR [2015-2017], Demo Fund [2008-2017], Innovation Expansion [2013-2016], and Propel [2012-2017].

IV. Equity Investment Tax Credits across the United States

Thirty-one states have at some point implemented an investment incentive tax credit (see Table 1). Seven states (Hawaii, Maine, Michigan, Minnesota, North Carolina, Oklahoma and Rhode Island) have either allowed their credit to sunset or the tax credit has been repealed. The 24 states that still have an investment credit operate a total of 30 distinct active tax credit programs (see Table 2).

Most states do not have a tax credit similar to the IFTC but instead have credits for investments made directly in qualified companies (i.e. “angel” tax credits). Only Kentucky and North Dakota were found to have a credit similar to IFTC.

A. Variation among Investment Incentive Tax Credits

Investment incentive tax credits most frequently vary along the following lines:

- Credit amount
- Annual credit award/claim caps
- Multi-year credit caps
- Taxpayer caps
- Invested business caps
- Required delay in claims
- Transferability
- Refundability
- Carry forward
- Invested business qualifications

The amount of the credit is the most straightforward difference among state programs. When a qualified investment is made in an eligible startup company (referred to as invested companies hereafter) or venture fund, states offer varying percentages of the investment as a credit. Hawaii had the most generous credit at 100 percent of the qualified investment, while among currently active programs, Kansas, Maryland, Tennessee, and Virginia are tied for the highest rate at 50 percent. New Jersey and Ohio have the least generous credits at 10 percent. Looking at each state with an active credit, Iowa’s IFTC is more generous than the credits of four states, is equal to that of five other states (25% being the mode among programs), and is less generous than 13 other states.

State programs also vary widely on aggregate program caps, meaning a restriction on the total amount of credits that can be awarded among all recipients over some time period. Some states do this on an annual or biannual basis. The lowest cap is in Utah at just $150,000 in Life Science and Technology Tax Credits per year for 2017 and 2018. Massachusetts and New Jersey have the highest annual cap at $25 million. New Mexico is unique in that it has no annual credit award cap but instead a credit claim cap of $2 million per tax year on a first-come, first-served basis; unredeemed credits in one tax year are given priority in the next. Other states with active programs, like North Dakota and Wisconsin, have no annual cap on awards or claims.

Some states have multi-year caps for the lifetime of the program, occasionally in conjunction with annual caps. The largest of these credits was Ohio at $45 million, which was enacted in 1996 and expired in 2013. Among active credits, Kentucky has the next largest cap at $40 million, but the state limits awards to $3 million per fiscal year. Vermont has the smallest program lifetime cap at $1.4 million.

In order to ensure that the credit can be received by a reasonable number of taxpayers, many states have implemented a cap on tax credits that can be awarded to a single taxpayer or a taxpayer's eligible investments in a specific company. Colorado has the lowest taxpayer cap: $20,000 in credits per investor per qualified business, though investors can invest in multiple companies. North Dakota's Angel Investor Tax Credit is limited to $45,000 per taxpayer per year among all investments and is limited to lifetime credits of $500,000. By contrast, like Iowa's IFTC, Arkansas has no limit on individual taxpayers, while Oklahoma's expired tax credit had no aggregate program cap or per taxpayer cap.

Some states do not impose any limit on the tax credits that can be received by the taxpayer making the investment, but impose limits on the amount of tax credits that can be awarded for investment in each business. Arizona and Massachusetts are in the lower end of this restriction: Arizona limits businesses to $2 million in qualified investments throughout the life of the program, while Massachusetts limits qualified investments in a single company to $250,000 per year. Kentucky is much higher at $1 million per year, while many other states including Iowa have no such cap.

A handful of states impose limits on when and how much of the credit can be claimed in a given tax year. Among active credits; Arizona, Arkansas, Kentucky, Louisiana, Massachusetts, North Dakota, South Carolina, and Vermont all have varying requirements as to when awarded credits can be claimed. Iowa used to require investors to wait three years after the investment to claim the AITC and IFTC, but this requirement was subsequently removed.

If a taxpayer is unable to claim a credit themselves because of lack of tax liability, some state credits are transferrable. This means the taxpayer who is awarded the tax credit can sell the credit to another taxpayer. The tax credits are typically sold at a discount. Connecticut, Louisiana, South Carolina, and Wisconsin have fully transferrable credits,

while Arkansas, Georgia, Iowa, Kansas, Kentucky, and North Dakota have some restrictions.

Relatively few state credits are refundable. When a tax credit is refundable, the amount of the tax credit that exceeds the taxpayer's tax liability is refunded back to the taxpayer. Maryland, Minnesota, Nebraska, and New Jersey have fully refundable credits.

Generally, if a credit is not refundable, then any unused credit in a given tax year can be applied to tax liability in future years. The number of years that a tax credit can be carried forward varies among states. Arizona, Massachusetts, Rhode Island, and Oklahoma have the shortest window at three tax years after the first year in which the claim is made, while Kansas allows credits to be carried forward indefinitely. Iowa's five-year carryforward is near the median of years allowed.

While the specifics for eligible invested businesses vary from state to state, like Iowa, most states require that at least a portion of a business' operations be located in the state that is offering the tax credit. Many states also put restrictions on the size of the business (determined by revenues, net worth, assets, number of employees, etc.), the age of the business, and/or the type of business.

B. Tax Credits among Iowa's Neighboring States

Three of Iowa's neighboring states (Illinois, Nebraska, and Wisconsin) have active equity investment tax credits. The Illinois tax credit was allowed to expire on July 1, 2016; however, it was reauthorized on August 24, 2017. Minnesota's tax credit was allowed to expire in 2017 and has not been renewed. Neither Missouri nor South Dakota have ever enacted an investment incentive tax credit.

The tax credit in Nebraska is fully refundable and equal to 40 percent of the qualified investment. There is an aggregate program cap of $4 million per year, and there is an award limit of $350,000 per year for taxpayers filing jointly and $300,000 per year for single filers. Businesses receiving investments are limited to the investment equivalent of $1 million in maximum lifetime credits.

The tax credit in Wisconsin is nonrefundable and equal to 25 percent of the qualified investment. The tax credit has no annual aggregate cap, but businesses are limited to $8 million of lifetime qualified investments. The tax credits are transferrable for venture funds but not for individuals.

Illinois' renewed tax credit remains nonrefundable and equal to 25 percent of the qualified investment. The program has an aggregate cap of $10 million per year. Taxpayers are limited to $500,000 in credits per investor per business. The tax credit cannot be transferred.

As of October 2017, the Minnesota Angel Tax Credit has sunset. While it was active, the tax credit was fully refundable and equal to 25 percent of the qualified investment.

There was an aggregate program cap of $10 million in FY 2017 and individual taxpayers were limited to $125,000 per taxpayer per year.

C. Tax Credits Most Similar to Iowa's Innovation Fund Tax Credit

Since 1998, Kentucky has operated the Investment Fund Tax Credit. The credit amount is equal to 40 percent of the qualified investment in an approved investment fund. The program cap, shared with the Angel Investment Tax Credit, which was enacted in 2014, is $40 million across all years, with no more than $3 million in each calendar year. Investment funds are limited to $8 million in total tax credits among all investors across all tax years. Taxpayers can only claim 50 percent of any tax credit award in any one tax year. The credit is nonrefundable with a 15 year carry forward and is transferrable for nonprofit taxpayers. The tax credit can be applied toward income, insurance, and financial institution taxes.

North Dakota enacted the Angel Investor Tax Credit on July 1, 2017. The program offers tax credits for investments in angel funds at two rates: for investments in angel funds that make investments in in-state companies, the credit is equal to 35 percent, and for angel funds that make investments in out-of-state companies, the credit is equal to 25 percent. There is no annual program cap, but taxpayers are limited to $45,000 in tax credits per year and a lifetime limit of $500,000. Each investment fund is limited to $5 million in credits among all investors across all tax years. The tax credit is neither transferrable nor refundable, and has a carryforward period of five years. The credit is applicable only to individual and corporate income tax.

Comparatively, the Iowa IFTC is more similar to Kentucky's program than that of North Dakota. In both Kentucky and Iowa, investment funds can only make qualified investments in in-state companies, the programs have an annual credit cap, and credits have some limited transferability. Unlike both states, Iowa has no credit limitations per taxpayer or invested business.

V. Literature Review

Before any discussion of research on investment incentive tax credits, it is important to stress that there is very little literature on such programs. This is likely because many credits have been implemented fairly recently, with the majority of credits enacted in the past ten years. In addition, research on state-level investment incentive credits is limited because there is currently no analogous federal credit. (It should be noted that there have been some efforts to create a federal angel tax credit, see Turmelle, 2015.)

It is an underlying assumption among all states that investment in local businesses is beneficial for a state's economic development and that equity investment credits can be used to incentivize these investments. An article from the Tax Policy Center notes that states use these tax credit programs to "attract local investment … with hopes that high-tech centers will develop into miniature Silicon Valleys" (Francis, 2014).

The Iowa Department of Revenue (IDR) completed the Iowa Venture Capital Tax Credits Study in 2014 with a focus on the Angel Investor Tax Credit to meet the Legislative requirement under Iowa Code 2.48 (Gullickson, 2014). Using data provided by IDR as well as external data on firm formation and survival from 1990 to 2011, researchers at Iowa State University found that companies which had received investment averaged $4 million more in sales and had 1.3 more employees than similar Iowa early-stage companies that had not received investment. However, the small sample size prohibited making the conclusion that the impact of the program was greater than zero.

Although it would be ideal to repeat a similar analysis of companies impacted by the IFTC, a lack of comparable data for the time period after the implementation of the IFTC prohibits a similar analysis for this credit. Instead, investment incentive credits are examined across the country at the state-level as will be discussed in Section VII.

So far, "venture capital" has been used loosely to describe any high-risk investment in early-stage or promising companies. However, this term can be broken down into three specific subsets of investment: seed, angel, and venture capital, with the size of the investments increasing and the degree of risk decreasing respectively. Seed investments are made at the very first stage of business development where there is highest risk, usually drawn from the entrepreneurs' own assets or from the direct friends and family of the entrepreneur. Once larger investment is needed, entrepreneurs approach angel investors, who are not related to the entrepreneur but are willing to invest large amounts of their own money and serve as a mentor. Beyond angel investors are venture capitalists, who are professional money managers that make even larger investments in more mature firms. Notably, venture capitalists often invest others' money and are particularly focused on each invested company's exit strategy (Schulte, 2016).

The two active credits in Iowa target different parts of this investment continuum. The AITC is focused on incenting angel investors to invest in Iowa early-stage companies, while the IFTC is focused on building venture capital for more established Iowa firms. It should be noted that the AITC could incent seed capital, but the provision in the program's statute that "'investor' does not include a person that holds at least a seventy percent ownership interest as an owner, member, or shareholder in a qualifying business" would prevent some family members from being able to claim a credit for seed capital investments.

For analytical purposes, angel investor tax credits and venture capital tax credits are treated similarly throughout this paper; however, the companies' situation and expected outcomes are likely quite different. The AITC is incentivizing investment at a very early stage, often before a company has any revenue. It is often the intent of the investment to stabilize the company and/or cross some technical hurdle that helps to establish revenue. The IFTC, by contrast, mostly incentivizes investment in companies that are

slightly more established and already generating some revenue, but require some assistance to scale-up operations or overcome a financial impediment.

Beyond the timing of the investment, angel and venture capital investments differ by the other services offered to the invested company. While angel investments could be made by a relative, friend, or supporter directly in a business, venture capital investments are made by institutional investors with experience in startup development and business administration. These investors offer advice and guidance for the company to develop its product and refine its operations to achieve profitability. While it is impossible to differentiate the benefits accrued from this non-financial support as compared to the investment itself, this expertise should be expected to confer greater benefits than investments alone. It should be noted that investors in innovation funds, not the institutional investors directing the funds, are the recipients of the IFTC.

As discussed in the comparative state survey of investment credits, many states have implemented tax policies to support small businesses in their local economies. Recent estimates report that small businesses represent 75 percent of all new jobs in the US and produce 13 times more patents per employee than large firms (Herndon, et al. 2012). In this vein, investment incentives are seen as a market-based approach to enhancing the entrepreneurial ecosystem for these businesses. Schulte (2016) writes: "Angel incentives expand the pool of would be Angel investors and thereby incrementally stimulate the addition of more monies available to new firms and growth companies."

The real question of interest for this analysis is the proverbial "But for…" test (Wisconsin, 2012). In the words from a Kentucky Center for Economic Policy report, "The critical question that must be asked in considering the effectiveness of and need for angel investor tax credits is whether they are truly necessary for investment to occur" (Thomas, 2017). Research on this topic is elusive: Schulte (2016) notes that most such analysis focuses on "how much money was distributed to Angel investors … rather than the principal intent of creating new jobs that would not have existed absent the tax credit."

A few reports on such credits make Schulte's case.

- The Louisiana Venture and Angel Capital Report (Graffagnini, 2015) highlights the total dollar value of angel and venture funding raised in Louisiana and concludes that there is insufficient angel funding in Louisiana to meet demands.
- A North Dakota Legislative Council report (2016) on the Angel Investment Tax Credit notes what data will be necessary when the Legislative Assembly completes the first evaluation of their angel investor tax credit, including "employment opportunities, business growth, or diversity in the state's economy *resulting from the availability of the incentive*" (emphasis added). When the Department of Commerce was asked to present this data, the data and analytical software was unavailable (Dever, 2016).

Most studies which have attempted to answer the “but for” question rely on survey data. A 2014 evaluation of the Minnesota Small Business Investment Tax Credit found that over 75 percent of taxpayers receiving the tax credit either made an investment that they would not have otherwise made or increased the amount of the investment made (Economic Development Research Group, 2014). The study surveyed investors who received the tax credit and only 18 percent responded that they would have made the same investment regardless of the tax credit. Almost half of the respondents said they would not have made the investment if not for the existence of the tax credit.

While states implement these policies with the desire to spur venture capital, some literature entertains the notion that increasing access to credit and investment can lower the quality of entrepreneurship. Engelhart (2012) suggests, “credit expansion makes more funds available for lower quality entrepreneurs.” The author supports this notion by analyzing US housing market data which finds that real estate investors make riskier and lower quality investments when interest rates are unusually low.

Two Canadian studies have similar findings. Carpentier and Suret (2005) analyzed outcomes of 83 companies receiving investment through an incentive program, finding that companies incentivized had lower profitability, on average, than similar companies and closed within a few years of investment. In a similar vein, an analysis of venture firms in Ontario finds that “firms with government support are more dependent on receipt of additional government funds” (Cumming and Johan, 2010), suggesting that support of venture capital does not in and of itself lead to self-sustaining capital growth. The authors also note that private equity had a greater correlation with patents obtained by innovative healthcare firms than investment received through the government incentive program.

These programs operate in the broader context of venture capital markets generally with their own share of flaws. A Kauffman Foundation study (Mulcahy, et al., 2012) contends that the existing venture capital system is broken. The authors note, “the majority of [venture capital] funds – sixty-two out of 100 – failed to exceed returns available from public markets, after fees and carry were paid.” They argue that traditional norms of venture firm and general partner relations reward venture firms for raising large funds instead of generating returns on investment, and the lack of general partner dollars in most deals encourages venture firms to “flip” companies instead of make long-lasting results. This suggests that, regardless of the effect of any credit, venture capital itself is a risky venture that generates uncertain outcomes.

VI. Analysis of Innovation Fund Tax Credit Awards, Claims, and Transfers

A. Innovation Fund Tax Credit Awards

Since the inception of the program, there have been 353 awards totaling $7.0 million in tax credits (see Table 3). Although the first Innovation Fund Tax Credits were not able to be issued until September 1, 2014, the award data reports the fiscal year in which the investment was actually made. The plurality of awards was made in FY 2016 (26.1%), but the plurality of award dollars were issued for FY 2015 investments (39.3%). FY 2018 is incomplete because this data only includes awards through December 2017.

Taxpayers eligible to make claims against the individual income tax comprise the majority of total awards at 203 (57.5%) and the plurality of total award amount at $2.7 million (37.9%) (see Table 4). This is followed by corporation income tax (16.1% of count and 25.9% of amount). Notably, no entity has been awarded the credit against the franchise tax levied on banks. Next Level Ventures (NLV), the one active innovation fund, states that the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 prevents most banks from making venture capital investments, and those that have an exemption from these regulations have not yet made an investment. The 353 awards were made to 63 unique taxpayers, reflecting that the same investors repeatedly make investments in the venture capital fund.

The award size varies widely by tax type. Fiduciaries (estates and trusts) have the smallest average award at $6,362 followed by non-fiduciary individual income tax filers with an average of $13,151. Both of these awards are often smaller than awards for other tax types because their award may be part of a larger investment made by a pass-through entity. Insurance premium taxpayers have the largest average at $61,796, but there have been only 11 of awards made to insurance companies to-date.

The vast majority of credit awards are given to resident individuals and companies (see Table 5). Of the 353 awards to-date, 318 awards have been to individuals residing or businesses listing an address in Iowa on the tax credit application. These awards total $6.9 million (97.7% of the total amount). This result is unsurprising given that nonresident taxpayers would likely need to transfer the credit to receive any benefit from the nonrefundable tax credit.

It should be noted that in each year of the program's existence, total awards have been significantly lower than the statutory cap. FY 2015 had the most awards at $2.8 million, which is still $5.2 million under the $8.0 million annual cap for the program.

B. Innovation Fund Tax Credit Claims

Since the program's inception, 439 Innovation Fund Tax Credit claims have been made totaling $4.9 million (see Tables 6 and 7). The Department is continuing to collect and validate claim data for filed returns for all fiscal years in this analysis, although most IFTC claims in FY 2017 and earlier are believed to be accounted for. It is worth noting that the number of claims (but not the amount) can exceed the number of awards

because one recipient can claim a share of the credit in a given tax year and carry the remainder of the credit award to future tax years if the amount of the award exceeds the taxpayer's tax liability or multiple shareholders can make claims to one award issued to a pass-through entity. Taxpayers with no Iowa tax liability in a given tax year still report the credit with a claim of $0 and the full amount is carried forward to the next tax year. These claims are included in the counts reported.

Fiscal years 2016 and 2017 had similar counts of claims (151 and 160 respectively, or 34.4% and 36.4% of the total count). However, the average claim in FY 2016 was over twice that of FY 2017 ($14,544 compared to $7,056), leading FY 2016 to constitute the vast majority of all credits claimed to date at $2.2 million (44.8%). While the FY 2018 average claim more closely resembles that of FY 2017, the fact that FY 2018 is incomplete makes comparison premature.

The majority of claims have been made by individual income taxpayers, both in count, at 331 claims (75.4%), and total amount, at $2.8 million (56.5%) (see Table 8). Fiduciaries have the next highest by count (13.9%) followed by credit unions claiming against the moneys and credits tax (4.3%). However, credit unions have the second largest total amount of claims at $0.84 million (17.1%) followed closely by insurance companies making $0.80 million in claims against the insurance premium tax (16.4%).

The first tax year in which an IFTC can be claimed is the calendar year in which the investment occurred, thus the first claim could be made in tax year 2013 (see Table 7). Because the tax credit is nonrefundable, taxpayers with tax liability less than the tax credit award can carryforward unused credits to future tax years. Taxpayers have done this every year.

In most cases, tax returns are filed in the fiscal year after the tax year (tax year 2014 claims are mostly claimed during fiscal year 2015). The exception is for investments made in 2013, which could first be claimed after issuance in September 2014, pushing those claims into fiscal year 2015. In general, it appears that taxpayers claim about 30 percent of available awards in the fiscal year after the year of investment (see Table 9). For 2013, the aforementioned delay resulted in 85 percent of claims being made in FY 2015. Taxpayers with tax credits awarded for investments in 2014 have claimed 84.1 percent to-date; this suggests the credits are likely to be fully claimed before expiration with FY 2018 incomplete and two more carryforward years available for claims.

One of the more curious findings from examining IFTC award and claim data is the handful of awards made in FY 2016 or earlier for which there are no claims or reported carryforwards. These credits total $417,328, which represents 8.4 percent of total awards for those years by amount. Attempts were made to find claims by reviewing the returns on which the awardees were eligible to make claims. Notably, none of these awards missing claims were issued to nonresidents.

C. Transfers of Innovation Fund Tax Credit Awards

Recall that awardees are able to transfer their nonrefundable IFTC one time. As of August 2017, 75 transfers had occurred totaling $1.4 million, with an average transfer of $18,678 (see Table 10). Given that there have been 353 awards made to-date, 21 percent of these awards have been transferred. The Department began to capture information on the consideration received by the transferor in FY 2017. Unfortunately, with the low counts of transfers since that time, there is not enough information to provide useful information about the difference between the tax credit amount and the amount that was paid to the transferor.

The vast majority of transfers by count have been from individual income taxpayers (60 of 75, or 80.0%), followed by corporations and then credit unions (see Table 11). By dollar amount of the tax credit awards, slightly more than half have been from individual income taxpayers (51.1%). Notably, all transferred tax credits to-date have been purchased by individual income taxpayers.

Knowing that awardees receive multiple tax credits, another interesting analysis is to consider how many awardees have transferred their credits (transferors) and whether repeated sales are made to the same taxpayers (transferees) (see Table 12). While there have been 75 transfers, these were sold by only 12 transferors and purchased by only 18 transferees. The average number of transfers per transferor was slightly above six while the average number of transfers per transferee was slightly above four.

One interesting finding from comparing nonresident awards to transfers is that the latter exceeds the former by over $1 million. This means that the vast majority of transfers are the result of resident individuals and companies receiving the credit then transferring it to another resident individual or company. It is assumed that the transferors lack sufficient tax liability to make use of the credit.

VII. Analysis of Invested Businesses

To date, Next Level Ventures (NLV) is the only active venture fund that has been certified by EDA and thus with investors making investments eligible for the IFTC. The output and outcome metrics will be discussed in aggregate.

Through the end of FY 2017, NLV had invested $19.4 million in seven companies. An additional company received investment in late July 2017. Iowa-based co-investors have invested another $12.9 in these seven, while out-of-state entities have invested another $11.1 million. Combined with $2.1 million in early-stage financing offered through EDA programs discussed in Section III, the seven companies have raised $45.5 million in financing.

As of May 2017, the seven companies had 230 full-time equivalent employees (FTEs). The annualized payroll of these employees was $18.9 million, equating to an average

annual wage of $82,127 or an hourly wage of $39.48. The reported wages are approximately 88.6 percent higher than the average annual wage in Iowa in May 2016. Most companies' average hourly wages are more than $40 per hour, while two are below $40.

Employment growth can be measured from the point at which the initial IFTC-incented investment in a company occurred and the present. Before NLV's first investment in each of the respective companies, the invested businesses had 136 FTEs. As of May 2017, the invested companies had 230 employees, representing a growth of 94 employees (69.1%) from the time of initial investment. However, between the time of investment and today, one company has decreased employment.

Combining the above data, it is possible to derive the cost to the State in terms of tax credits for each job created at the invested companies. Since program inception through the end of FY 2017, $6.4 million in credits had been authorized for investments in NLV. If employment growth at the seven companies has been 94, then a job at the invested companies was created for every $64,842 in tax credits issued.

Some other basic information about the companies is worth noting:

- Four companies are located in central Iowa while three are located in eastern Iowa.
- According to EDA's classification, most companies are classified into the information technology industry while one is in medicine.
- Four of the seven companies had been in existence five years or fewer before receiving investment from NLV. The other three had been existence for ten or more years before receiving investment from NLV.

It should be noted that the total investment in NLV incented through tax credit awards does not equal the investment awarded to invested businesses. As stated, through the end of FY 2017, NLV had invested $19.4 million in businesses; in the same time frame, Next Level was responsible for tax credits associated with investments of $25.5 million. NLV has stated that this difference is attributable to investment called but not yet announced as well as salaries and operating expenses, including accounting and legal services, for NLV.

VIII. State-level Panel Data Analysis of Investment Incentive Tax Credits

From an economic theory of public policy, programs such as IFTC and other equity investment credits should only be warranted if the economy is experiencing a market failure, such that the optimal level of a good or service is not produced. In the case of Iowa, market failure could exist because of a lack of local investors interested in venture capital or outside investors' unwillingness to invest in Iowa businesses. For example, investors may be reluctant to invest outside of California because of recent profitable startups from that state, regardless of the current state of companies in or outside of California. In theory, equity investment tax credits encourage both in-state and out-of-

state investors to look at funds that focus on Iowa companies by subsidizing their investments.

Given that insufficient data is available to perform a rigorous analysis of the impact of the IFTC on invested companies, the following analysis attempts to quantify the broad economic impact of implementing investment incentive tax credits across the states.

A. Data Sources

Two sources were consulted for data on the entrepreneurial ecosystem of each state: PricewaterhouseCoopers (PwC) and the Kauffman Foundation. In their quarterly MoneyTree report (2017), PwC has estimated venture capital deals and total investment by state on an annual basis for the 2010 to 2016 period. It should be noted that there are multiple state-year entries that had no recorded deals, which impacts the analytical techniques that can be employed. The number of deals was used as the first dependent variable; investment was divided by the number of deals to use average deal size as the second dependent variable.

The Kauffman Foundation publishes an annual index of numerous measures of entrepreneurship by state and metropolitan region. Currently, the index has three categories of measures: startup activity, Main Street entrepreneurship, and growth entrepreneurship. Given that most state investment incentives are focused on high growth businesses, the growth entrepreneurship metrics were selected for analysis.

The growth entrepreneurship category is broken down further into three categories: rate of startup growth, share of scale-ups, and high growth company density. Rate of startup growth measures the rate at which startups' revenue grew in their first five years of existence. Share of scale-ups measures the share of businesses that start small and grow to fifty or more employees within ten years. High growth company density is a measure of the concentration of companies (number per 100,000 firms) with at least $2 million in revenue that also average over 20 percent annual revenue growth for three years. Each of these metrics was used as a dependent variable in varying types of regression models.

The credit variable used reflects both the presence and the rate of each investment incentive credit in each state. Using principally the websites of revenue and economic development agencies, IDR aggregated data on whether each state had a credit in a given year of the analysis period. For every year a state had a credit in place, the variable is set to the rate of the credit (e.g. 0.25 if the credit is equal to 25 percent of the eligible investment). The variable is set to 0 if the state did not have a credit in that year. A state is considered to have a credit in a given year if the program's authorizing statute allowed the program to exist for at least one day within that year. All regressions were also tested with a lagged implementation year, meaning that states were only treated as having a credit if the program existed in the previous year.

For some regressions, a set of regional variables is used. These are either four dummy variables based on US Census regions or nine based on US Census divisions. The map of states by region and division can be found in Figure 1.

In most analyses, year was included to control for the exogenous macroeconomic effects on all five dependent variables.

B. Deal and Investment Regressions

Given that the intent of state-level investment incentive programs is to increase the amount of investment deals in a state, the PwC investment data was chosen as the first set of dependent variables to test. The hypothesis is that an investment incentive tax credit positively impacts the number of deals or average deal amount.

In the United States over the period from 2010 to 2016, the PwC data reports that there were 33,881 venture capital deals totaling $328.1 billion. California had the most deals (14,459 during the period, or 43% of all deals), while Alaska had none. During this period, Iowa had 33 deals (0.1% of the total).

Looking at the most recent year (2016) as an example, the average state had 101 deals (see Table 13 for a summary of all PwC-provided data for calendar year 2016). However, because investment deals are far from evenly distributed among states, the median is significantly lower at 23. Iowa had four deals in 2016, which ranks 41st among the 50 states and the District of Columbia.

The distribution and statistics of total dollar value of investment are similar to the count of investment. In 2016, the average state attracted $1.2 billion in investment while the median had $99.3 million. Iowa had $19.4 million, which ranked 36th among the 50 states and the District of Columbia.

The first model specification is a fixed effects, negative binomial regression model to predict both the number of deals and the average deal size using the rate of an investment incentive credit, controlling for state and year. A fixed effects model was chosen because the data presented is panel data: the forty-eight contiguous states over a span of seven years (Hawaii and Alaska were excluded because public policy outcomes tend to reflect exogenous factors in both states that are distinct from the other forty-eight).

The nature of the dependent variable necessitated either a Poisson or a negative binomial regression (no zero truncation) for three reasons:

- Deals is a count variable (i.e. discrete and non-continuous);
- Deals and average investment do not allow negative values; and
- The deals variable is occasionally equal to zero.

States vary widely in terms of the number of deals and average size of investment. Ranked by number of deals in CY 2016, California had the most deals at 1,894 while Wyoming, South Dakota, and North Dakota each had none. Among the 48 states in this

analysis, Iowa ranks 37th for total number of deals at four deals. Ranked by average size of investment, Virginia had the highest average deal ($26.8 million) while among the non-zero states Idaho had the lowest $0.7 million. Despite having only four deals, Iowa actually ranked seventh in this metric with an average deal value of $12.2 million.

In the regression attempting to explain the number of venture capital deals in each state, the coefficient on the credit rate variable was positive but not statistically significant at the level of p = 0.05 (see Table 14). When the analysis was replicated for the average investment size, the tax credit rate variable was again positive and insignificant. (A p-value threshold of 0.05 is the most common level selected in statistical analysis. This is a high threshold for evidence that the independent variable has an impact on the dependent variable.)

The second model specification is a negative binomial regression model again using the credit rate variable and year but also dummy variables for Census region (see Figure 1). In this regression, the coefficient on the credit rate variable was negative and significant. This would suggest that controlling for region of the country, a state with a credit is likely to have between one and two fewer deals than a state without a credit. A separate regression for the average deal size also using regional dummies had a coefficient on credit rate that was negative but not significant.

A similar regression was performed using dummy variables for Census division rather than region (see Figure 1). Using the number of deals as the dependent variable, the credit rate variable was negative but insignificant. Using average deal size as the dependent variable yielded a positive coefficient but was again not significant.

These six regressions are generally inconclusive, with five having an insignificant coefficient on the credit rate variable of interest. The only analysis with a significant coefficient implied that, controlling for region of the country, states with a credit are less likely to have investment deals than those that do not have a credit. This is the opposite of the expectation that investment incentive credits would increase investment deals.

However, the four regressions that do not control for each state using a fixed effect but rather use region or division dummies could likely be heavily affected by outliers. In 2016, 53.8 percent of venture capital dollars were invested in California. New York was a distant second at 12.7 percent, while Massachusetts was third at 10.1 percent (see Figure 2). This means that investment of over three-quarters of all venture capital dollars occurred in the top three states.

Relevant to this analysis, none of the three states mentioned above have a credit for the time period of this study. Figure 3 presents the total dollar value of investments by state for CY 2016 by the credit rate for each state in that year. It is not surprising that states with low levels of venture capital determine an incentive for venture capital is needed. However, because the vast majority of all investment occurs in states without a credit, without fixed effects, this relationship would directly result in a negative coefficient on credit rate in a regression analysis.

Because the high-investment outliers are almost exclusively on the coasts, it is possible that an analysis which compares only Midwestern states would have a better chance at identifying the marginal impacts of an investment incentive credit on deals. The next regression restricted the analysis to only states in the Census Midwest region and included only year and the credit rate variable. For both deals and average deal size as a dependent variable, the regressions had insignificant negative coefficients on credit rate.

Given the quantity of insignificant findings, it is possible that changing the timing specified in the model could yield different results. The eight regressions above were performed again but the credit rate variable is only positive for the first year after the implementation of the credit if one exists (see Table 15). The results were robust to this change: the significance level of each entry (including the significant negative coefficient on credit rate for a full 48 state analysis using regional dummies) was the same.

C. Panel Data Analysis: Using Kauffman Foundation Entrepreneurship Data

The indexed variables published by the Kauffman Foundation were chosen as the second set of dependent variables. The hypothesis is that the credit positively impacts these metrics of a state's entrepreneurial ecosystem.

Looking at the Kauffman Foundation's first metric (rate of revenue growth among startups over the preceding five years) for the 2008 to 2016 period, startups in each state experienced an average of 55.0 percent revenue growth (see Table 13 for a summary of all Kauffman-provided data). In 2016, the average rate was 57.4 percent, lower than the peak of 62.4 percent in 2008. In 2016, North Dakota had the highest rate at 86.5 percent while South Dakota had the lowest at 20.4. In that year, Iowa ranked 45th with 44.9 percent growth over the previous five years among the state's startups.

Also during the 2008 to 2016 period, the Foundation's second metric (the share of startups that grow to mid-sized companies in the preceding ten years) averaged 1.5 percent. In 2016, the average share was 1.4 percent; Louisiana ranked first in terms of scale-ups at 2.2 percent of small businesses while Michigan ranked last at 0.8 percent. Iowa ranked 28th in 2016 with 1.4 percent of companies scaling up.

The Foundation's third metric (the number of high growth companies per 100,000 businesses within each state) for the period of 2008 to 2016 was 54. In 2016, the average was 49; Virginia had the highest rank in this metric (175), while Wyoming had the lowest (6). Iowa ranked 37th at 32 high growth businesses per 100,000.

The set of regressions used to determine the impact of investment incentive credits on deals and average investment per deal was replicated for the three growth entrepreneurship metrics. A regression for each dependent variable was performed using a fixed effect design, regional dummies, division dummies, restricting the analysis

to the Midwest, and then replicating the above four regressions with a lagged credit start variable (see Tables 14 and 15).

The most consistent finding was that for the rate of startup growth, representing the average annual rate at which startups grew during their first five years of existence, the credit rate variable was not significant in any regression formulation. The sign on the coefficient was variously negative and positive, suggesting that the effect itself was indeterminate or nonexistent.

In the estimates on the share of scale-ups, by contrast, the coefficient on the credit rate was significant in every regression, but with varying signs. In the fixed effect regressions, the credit rate variable was significant with a negative coefficient (for both lagged and non-lagged); this would suggest that upon implementation of a credit, the share of companies that go from small-sized to medium-sized is reduced by 0.4 percentage points. However, because of the non-experimental nature of the design, the finding could also be that states which are having increasingly few companies scaling-up implement investment credits, which then do not have a noticeable impact in increasing this share. This effect was robust in a change to a lagged dependent variable.

For the non-fixed effects regressions, the coefficient on credit is positive and significant. Across these regressions, the interpretation of the coefficient is that states which implement a credit have 0.1 to 0.2 percentage points more small companies scale up operations. While ostensibly contradicting the regression results discussed above, it is possible that the states which implement credits are intrinsically more likely to have businesses that scale-up, which is captured by the fixed effects but not in the other models; however, the actual implementation of the credit does not significantly change this outcome. This finding was also robust in the change to a lagged dependent variable.

Finally, the regressions for high growth company density all had a positive coefficient on credit rate and most were significant. The time-lagged fixed effects model was significant while the non-lagged model was not significant. This first finding suggests that states which implement an investment incentive credit have, on average, 30 more high growth companies per 100,000 companies than those states which do not have a credit. The fact that the lagged results are more significant than the non-lagged results suggests that other states (like Iowa) take time to implement a credit and thus realize an impact from its creation.

Besides the Midwest only regressions, all non-fixed effects regression models found that the credit rate had a significantly positive impact on the number of high growth companies within each state. Division dummies tended to yield more significant coefficients for credit rate than regional dummies. Like the interpretation of the above, these results suggest that states with credits are likely to have between 8 and 11 more high growth companies per 100,000 companies than those states without a credit. Again, because of the non-experimental nature of this analysis, it is impossible to

delineate if states with more high growth companies are more likely to implement a credit or if states that have a credit tend to produce more high growth companies.

Notably, the Midwest-only regressions for high growth company density did not have significant coefficients on credit rate. It is possible that there are not a sufficient number of high growth companies within Midwestern states to noticeably impact this metric, or that Midwestern states have difficulty attracting high growth companies even when implementing such credits.

D. Statistical Analysis Discussion

The findings from this analysis are mixed. Most of the regressions to measure the impact of credit rate on the number of deals or the average size of deals have insignificant results. The one significant finding, a negative coefficient using regional dummies, is not robust to a change in dummy variables used, which suggests that the result is spurious. Analysis of entrepreneurship metrics provided by Kauffman are also conflicting, as the share of businesses scaling up operations and the number of high growth companies within a state both appear to be impacted by the credit, while the average growth rate of startups is not.

While it is the nature of statistical analysis that makes it is impossible to prove the lack of an impact, the findings from these analyses at the very least suggest that the implementation of an investment incentive credit does not have an immediate positive impact on the entrepreneurial ecosystem of a state.

One important piece of this analysis is to note that the regressions have been performed using panel data taking advantage of the variation in each state's tax code. Because the creation of any tax credit is driven by exogenous factors and not subject to manipulation through this analysis, these regressions are not able to assess the causal nature of the impact of a change in tax credits on investment. Given that such credits are often implemented as part of a broader economic development program, it is surprising that the combined effect of the tax credit change and any associated events did not have a demonstrable impact on the number and value of deals.

Many factors complicate this finding. First and foremost, it is likely that such credits do not impact a state's baseline level of entrepreneurship in the same year, one year later, or maybe even two years later. The Iowa Innovation Fund Tax Credit became effective January 2011 but no credits were issued until September 2014; if other states experienced a similar delay, then it would only be appropriate to compare results three or more years after the statutory implementation of the credit. Given the existing data, implementing this criterion would so greatly restrict the number of observations having a credit that analysis would be impossible.

Second, this analysis glossed over many differences among state investment incentive credits. For example, this analysis treats Minnesota and Wisconsin as having the same credit (25% of investment), but Minnesota's credit is refundable and capped at $15

million per year while Wisconsin's is nonrefundable and has no annual cap. While additional variables were not added to this analysis due to limited data, a longer time horizon in a future analysis could allow a more nuanced approach to the credit variable which better assesses credits' impacts.

Third, it is also likely that other factors are swamping the impact of the credit. Put simply, dozens if not hundreds of forces impact where and when business investment and growth occurs, ranging from tax rates to labor laws to oil discoveries to weather. While a fixed effect regression should account for intrinsic differences in each state, anything that changes concurrently with the implementation of an investment incentive credit (e.g. more expansive business tax reform) would complicate the relationship between the credit and observed business investment and growth.

IX. Conclusion

This evaluation study provides an analysis of the Iowa Innovation Fund Tax Credit. The credit first became effective in 2011 and offers a credit equal to 25 percent of qualified investment in a certified Iowa innovation fund that makes investments exclusively in Iowa early-stage companies. Tax credit awards issued to all investors are capped at $8 million each fiscal year. This program exists simultaneously with the Angel Investor Tax Credit offering credits for direct investments in Iowa startups, as well as numerous other grant and loan programs operated by the Iowa Economic Development Authority.

From September 2014 to date, $7.0 million in credits have been awarded and $4.9 million have been claimed. Only one innovation fund has been actively receiving and making investments. As of the end of fiscal year 2017, the seven companies invested by the sole innovation fund had 230 employees. This represents an increase of 94 employees from the time of the initial investment from the innovation fund.

A series of regression analyses was performed on state-level investment and other entrepreneurship metrics across the contiguous states in the United States. The hypothesis was that the presence of an investment incentive credit would have a demonstrable impact on investment. The results were inconclusive: the presence of a credit did not significantly change the number or average size of investments, while other metrics showed that states with a credit did have a more favorable climate for startup growth.

Timing of implementation, differences among credits, and other exogenous factors may have contributed to the observed inconclusive findings. Many stakeholders interviewed for this report stated that it is likely too soon to observe findings from these credits. The continued implementation of Iowa's and other states' credits will facilitate future analyses to better identify the impact of investment incentive credits.

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Iowa's Innovation Fund Tax Credit

Program Evaluation Study

Tables and Figures

Table 1. States with and without Active Investment Incentive Credit

Active Credit	Expired Credit	No Credit
Arizona	Hawaii	Alabama
Arkansas	Maine	Alaska
Colorado	Michigan	California
Connecticut	Minnesota	Delaware
Georgia	North Carolina	District of Columbia
Illinois	Oklahoma	Florida
Indiana	Rhode Island	Idaho
Iowa		Mississippi
Kansas		Missouri
Kentucky		Montana
Louisiana		Nevada
Maryland		New Hampshire
Massachusetts		New York
Nebraska		Oregon
New Jersey		Pennsylvania
New Mexico		South Dakota
North Dakota		Texas
Ohio		Washington
South Carolina		West Virginia
Tennessee		Wyoming
Utah		
Vermont		
Virginia		
Wisconsin		

Source: State agency websites, various news articles

Table 2. Investment Incentive Tax Credits by State

State	Tax Credit	Enactment/ Expiration	Amount of Tax Credit	Annual Program Cap	Taxpayer/ Business Cap	Qualifying Tax Types	Required Delay before Claim	Refundable	Carry Forward	Transferable
Alabama	None									
Alaska	None									
Arizona	Angel Investment Tax Credit	**Enacted:** July 1, 2006 **Expiration:** June 30, 2021	30% of the qualified investment If the investment is made in a rural or bioscience company, the credit is equal to 35% of the qualified investment.	$20 million between July 1, 2006 and June 30, 2017 $2.5 million per fiscal year between July 1, 2017 and June 30, 2021	Tax credits for an investor are limited to qualified investments equal to or less than $500,000 per calendar year. Businesses are limited to lifetime aggregate qualified investments up to $2 million.	Individual Income Tax	The tax credit is claimed over a three year period with 10% eligible to be claimed each year (for credits equal to 35%, the eligible percentages are 12%, 12%, and 11% in each of the three years). The tax credit cannot be claimed until the tax year following the year in which the investment was made.	No	3 Years	No
Arkansas	Equity Investment Tax Credit	**Enacted:** January 1, 2007 **Expiration:** December 31, 2028	33 1/3% of the qualified investment	$6.25 million per calendar year	None	Any state income tax that may be imposed on the investor.	The amount of tax credit claimed in a single tax year cannot exceed 50% of the taxpayer's liability.	No	9 Years	Yes, but must be sold within one year of the issuance of the tax credit.
California	None									
Colorado	Innovation Investment Tax Credit	**Enacted:** January 1, 2010 **Expiration:** December 31, 2010	15% of the qualified investment.	$750,000	$20,000 per investor per qualified business.	Individual Income Tax	No	No	5 Years	No

Table 2 cont. Investment Incentive Tax Credits by State

State	Tax Credit	Enactment/ Expiration	Amount of Tax Credit	Annual Program Cap	Taxpayer/ Business Cap	Qualifying Tax Types	Required Delay before Claim	Refundable	Carry Forward	Transferable
Colorado	Advanced Industry Investment Tax Credit	**Enacted:** July 1, 2014 **Expiration:** January 1, 2023	25% of the qualified investment. If the qualified business is located in a rural area or economically distressed area, the credit is equal to 30% of the qualified investment.	$375,000 for calendar year 2014 $750,000 in subsequent calendar years	$50,000 in credits per investment	Individual Income Tax	No	No	5 Years	No
Connecticut	Angel Investor Tax Credit Program	**Enacted:** July 1, 2010 **Expiration:** June 30, 2019	25% of the qualified investment	FY 2011 and 2012: $6 million FY 2013 through FY 2019: $3 million	$250,000 lifetime per taxpayer $2,000,000 in cash investments per business	Individual Income Tax Corporate Income Tax	No	No	5 Years	Yes
Delaware	None									
District of Columbia	None									
Florida	None									
Georgia	Angel Tax Credit	**Enacted:** January 1, 2011 **Expiration:** December 31, 2018	35% of the qualified investment.	$5 million per year	$50,000 credit per taxpayer per taxable year	Individual Income Tax	Two year delay after year of investment	No	5 Years	Only to heirs and legatees upon qualified investor's death

Table 2 cont. Investment Incentive Tax Credits by State

State	Tax Credit	Enactment/ Expiration	Amount of Tax Credit	Annual Program Cap	Taxpayer/ Business Cap	Qualifying Tax Types	Required Delay before Claim	Refundable	Carry Forward	Transferable
Hawaii	High-Technology Business Investment Tax Credit	**Enacted:** July 1, 1999 **Expiration:** December 31, 2010	10% of the qualified investment for 1999 and 2000. 100% of the qualified investment between 2001 and May 2009.	None	$500,000 per tax year per taxpayer in 1999 and 2000. $2 million per business	Individual Income Tax Corporate Income Tax Franchise Tax (Banks and Other Financial Corps) Fiduciary Income Tax Insurance Premiums Tax	35% of the tax credie can be claimed the year of the investment. 25% can be claimed the year following the investment. 20% can be claimed the 2nd year following the investment. 10% can be claimed the 3rd and 4th years following the investment.	No	5 Years (Initially there was no limit on the carry forward period.)	Between 2000 and 2009 the tax credits were transferrable between shareholders in the company. A taxpayer was not limited to their pro-rata share of tax credits.
Idaho	None									
Illinois	Angel Investment Credit Program	**Enacted:** January 1, 2011 **Expiration:** December 31, 2021 **Inactive:** Between July 1, 2016 and August 23, 2017	25% of the qualified investment.	$10 million per year	An investor can claim up to $500,000 in tax credits per business. There is not a limit on total credits an investor may receive	Individual Income Tax Corporation Income Tax Fiduciary Income Tax	No	No	5 Years	No
Indiana	Venture Capital Investment Tax Credit	**Enacted:** July 1, 1999 **Expiration:** December 31, 2020	20% of the qualified investment.	$12.5 million per year	The lesser of 20% of the qualified investment or $1 million per business.	Any individual or entity that has any state tax liability.	No	No	5 Years	No

Table 2 cont. Investment Incentive Tax Credits by State

State	Tax Credit	Enactment/ Expiration	Amount of Tax Credit	Annual Program Cap	Taxpayer/ Business Cap	Qualifying Tax Types	Required Delay before Claim	Refundable	Carry Forward	Transferable
Iowa	Innovation Fund Tax Credit	**Enacted:** January 1, 2011	25% of the qualified investment in an innovation fund	$8 million per fiscal year	None	Individual Income Tax Corporation Income Tax Franchise Tax Insurance Premium Tax Moneys and Credits Tax	No	No	5 Years	Yes
Iowa	Venture Capital Tax Credit - Qualifying Business (Angel Investor Tax Credit)	**Enacted:** January 1, 2002	25% of the qualified investment	Initial lifetime program cap was $10 million. Current program cap is $2 million per fiscal year.	$500,000 per qualifying business per fiscal year $100,000 per taxpayer per fiscal year	Individual Income Tax Corporation Income Tax Franchise Tax Insurance Premium Tax Moneys and Credits Tax	No	Yes - to investors who file individual income tax	3 Years	No

Table 2 cont. Investment Incentive Tax Credits by State

State	Tax Credit	Enactment/ Expiration	Amount of Tax Credit	Annual Program Cap	Taxpayer/ Business Cap	Qualifying Tax Types	Required Delay before Claim	Refundable	Carry Forward	Transferable
Kansas	Angel Investor Tax Credit	**Enacted:** January 1, 2005 **Expiration:** December 31, 2021	50% of the qualified investment	TY 2007 - $4 million TY 2008, 2009, 2010 - $6 million TY 2011 - $5 million TY 2012 and thereafter- $6 million	$50,000 in credits per qualified business per year $250,000 in credits per taxpayer per year	Individual Income Tax	No	No	Unlimited	Yes - after three years of no liability - must be claimed in year of transfer
Kentucky	Investment Fund Tax Credit	**Enacted:** 1998	40% of the qualified investment in an approved investment fund	$40 million total program cap over all years - shared with Kentucky Angel Investment Act $3 million per calendar year	Credits available to any single investment fund shall not exceed, in aggregate, $8,000,000 for all investors in all taxable years	Individual Income Tax Corporate Income Tax Insurance Tax Financial Institution Tax	A taxpayer may first claim its credit in the year following the year in which the credit is granted. The taxpayer is limited to claiming 50% of the issued tax credit in a tax year.	No	15 Years	Yes - for nonprofits
Kentucky	Angel Investment Tax Credit	**Enacted:** July 15, 2014	50% of qualified investment in companies located in low-income counties 40% of qualified investment in all other counties	$40 million total program cap over all years - shared with Kentucky Investment Fund Tax Credit $3 million per calendar year	$200,000 of credits per investor $1,000,000 of credits for all investors in a single company	Individual Income Tax	A taxpayer may first claim its credit in the year following the year in which the credit is granted. The taxpayer is limited to claiming 50% of the issued tax credit in a tax year.	No	14 Years	Yes

Table 2 cont. Investment Incentive Tax Credits by State

State	Tax Credit	Enactment/ Expiration	Amount of Tax Credit	Annual Program Cap	Taxpayer/ Business Cap	Qualifying Tax Types	Required Delay before Claim	Refundable	Carry Forward	Transferable
Louisiana	Angel Investor Tax Credit	**Enacted:** 2005	25.2% of the qualified investment	$3.6 million per year through FY 2018 $5 million per year effecitve FY 2019	$720,000 in investments per business per year and $1.44 million in investments per business over the life of the program.	Income Tax Franchise Tax	No	No	10 Years	Yes
Maine	Seed Capital Tax Credit Program	**Enacted:** August 28, 1988 **Expiration:** December 31, 2016	50% of the qualified investment	Starting with investment year 2016, $5,000,000 in credits are available per year	$500,000 in investment per investor per business over three consecutive calendar years - investor group amount is divided by number of investors $5,000,000 lifetime total investment per business	Individual Income Tax Corporate Income Tax Franchise Tax	25% of the credit can be taken in the tax year in which the investment is made and 25% can be taken in each of the next three tax years. The taxpayer is limited to offsetting up to 50% of tax liability with the tax credit.	Yes, for private venture capital funds.	15 Years	No
Maryland	Cybersecurity Investment Incentive Tax Credit	**Enacted:** January 1, 2014 **Expiration:** December 31, 2018	33% of the qualified investment	$2,000,000 per year	Investments from $25,000 to $500,000 per individual investor. There is a limit of 15% of the annual tax credit cap per business ($300,000 in FY 2018).	Individual Income Tax Corporate Income Tax	No	Yes	No	No

Table 2 cont. Investment Incentive Tax Credits by State

State	Tax Credit	Enactment/ Expiration	Amount of Tax Credit	Annual Program Cap	Taxpayer/ Business Cap	Qualifying Tax Types	Required Delay before Claim	Refundable	Carry Forward	Transferable
Maryland	Biotechnology Investment Incentive Tax Credit	**Enacted:** July 1, 2006	50% of the qualified investment	Effective FY 2015, $12 million per year	Investments from $25,000 to $500,000 per individual investor. There is a limit of 15% of the annual tax credit cap per business ($1.8 million in FY 2018).	Individual Income Tax Corporate Income Tax	No	Yes	No	No
Massachusetts	Angel Investor Tax Credit	**Implemented:** January 1, 2017	20% in e-health, information technology, and healthcare businesses 30% in qualifying businesses in certain communitities	$25,000,000 per year	$125,000 in investments per year per investor $250,000 in investments per year for each qualifying business	Individual Income Tax	Only $50,000 can be claimed in any calendar year	No	3 Years	
Michigan	Small Business Investment Tax Credit	**Enacted:** December 31,2010 **Expiration:** December 31, 2011	25% of the qualified investment	$9 million per calendar year	Maximum tax credit of $250,000 in any one year for investors and for businesses and may not invest more than $1 million in any one business. Qualified investment groups are limited to $4 million in credits	Individual Income Tax Corporate Income Tax	Tax credit provided in equal installments over two years.	No	5 Years	No

Table 2 cont. Investment Incentive Tax Credits by State

State	Tax Credit	Enactment/ Expiration	Amount of Tax Credit	Annual Program Cap	Taxpayer/ Business Cap	Qualifying Tax Types	Required Delay before Claim	Refundable	Carry Forward	Transferable
Minnesota	Angel Tax Credit	**Enacted:** April 1, 2010 **Expiration:** December 31, 2017	25% of the qualified investment	$15 million per year for 2014 to 2016 $10 million per year for 2017	Maximum tax credit is $125,000 per taxpayer per year ($250,000, if filing jointly).	Individual Income Tax	No	Yes	No	No
Mississippi	None									
Missouri	None									
Montana	None									
Nebraska	Angel Investment Tax Credit	**Enacted:** August 10, 2011 **Expiration:** December 31, 2022	40% of the qualified investment	$4 million per year	Maximum tax credits of $350,000 for couples filing joint return and $300,000 for single filers. Lifetime tax credit max per business of $1,000,000	Individual Income Tax	No	Yes	No	No
Nevada	None									
New Hampshire	None									
New Jersey	Angel Investor Tax Credit	**Enacted:** January 1, 2012	10% of the qualified investment	$25 million per calendar year	Max credit of $500,000 per investment	Corporate Income Tax Gross Income Tax (Individuals, Estates, Trusts)	No	Yes	15 Years for Corporations Only	No
New Mexico	Angel Investment Tax Credit	**Enacted:** January 1, 2007 **Expiration:** December 31, 2024	25% of the qualified investment up to $62,500	$2,000,000 in credit claims per calendar year	Can claim credit for qualified businesses in no more than five qualified businesses per taxable year	Individual Income Tax Corporate Income Tax	No	No	5 Years	No

Table 2 cont. Investment Incentive Tax Credits by State

State	Tax Credit	Enactment/ Expiration	Amount of Tax Credit	Annual Program Cap	Taxpayer/ Business Cap	Qualifying Tax Types	Required Delay before Claim	Refundable	Carry Forward	Transferable
New York	None									
North Carolina	Qualified Business Investment Tax Credit	**Enacted:** January 1, 2008 **Expiration:** January 1, 2014	25% of the qualified investment	$7.5 million	$50,000 per taxpayer in a calendar year.	Individual Income Tax	The tax credit can first be applied to tax liability in the year following the year of investment.	No	5 Years	No
North Dakota	Seed Capital Investment Credit	**Enacted:** January 1, 2002	45% of the qualified investment in a certified business	$3.5 million per calendar year	For investments made after January 1, 2013 a taxpayer is limited to lifetime claims of $500,000, a married couple is considered one taxpayer.	Individual Income Tax Corporate Income Tax	Only $112,500 of credit can be used in any tax year	No	4 Years	No
North Dakota	Angel Investor Tax Credit	**Enacted:** July 1, 2017	35% of the qualified investment in an angel fund that is invested in in-state companies 25% of the qualified investment in an angel fund that is invested in out-of-state companies	None	$45,000 of credit per year. A taxpayer is limited to lifetime claims of $500,000, a married couple is considered one taxpayer. Investors in one fund cannot receive more than $5 million in credits	Individual Income Tax Corporate Income Tax	No	No	5 years	No

Table 2 cont. Investment Incentive Tax Credits by State

State	Tax Credit	Enactment/ Expiration	Amount of Tax Credit	Annual Program Cap	Taxpayer/ Business Cap	Qualifying Tax Types	Required Delay before Claim	Refundable	Carry Forward	Transferable
North Dakota	Angel Fund Investment Tax Credit	**Enacted:** 2007 **Expiration** June 30, 2017	45% of the qualified investment in an angel fund	None	$45,000 of credit per year. For investments made after January 1, 2013 a taxpayer is limited to lifetime claims of $500,000, a married couple is considered one taxpayer. Investors in one fund cannot receive more than $5 million in credits	Individual Income Tax Corporate Income Tax	No	No	7 Years	Only for investments made in 2011 and 2012.
Ohio	InvestOhio	**Enacted:** 2011	10% of the qualified investment	$100 million per biennium	Maximum investment is $10 million per investor in a biennium	Individual Income Tax	No	No	7 Years	No
Ohio	Technology Investment Tax Credit	**Enacted:** November 18, 1996 **Expiration:** September 29, 2013	25% of the qualified investment. 30% of the qualified investment if the investment is being made in an "Encouraging Diversity Growth and Equity (EDGE)"-qualified entity, or an entity in a distressed county.	$45 million lifetime cap	A business is limited to $1.5 million of qualifying invesments. A taxpayer is limited to $250,000 per entity for investments that qualify for 25% tax credit or $300,000 per entity for investments that qualify for 30% tax credit.	Personal Income Tax Corporation Franchise Tax Public Utility Excise Tax Dealers In Intangibles Tax	No	No	15 Years	No

Table 2 cont. Investment Incentive Tax Credits by State

State	Tax Credit	Enactment/ Expiration	Amount of Tax Credit	Annual Program Cap	Taxpayer/ Business Cap	Qualifying Tax Types	Required Delay before Claim	Refundable	Carry Forward	Transferable
Oklahoma	Small Business Capital Formation Tax Credit	**Enacted:** January 1, 2001 **Expiration:** December 31, 2011	20% of the qualified investment.	None	None	Corporate Income Tax Individual Income Tax Privilege Tax Insurance Premium Tax	No	No	3 Years	No
Oklahoma	Rural Venture Capital Formation Tax Credit	**Enacted:** January 1, 2001 **Expiration:** December 31, 2011	30% of the qualified investment.	None	None		No	No	3 Years	No
Oregon	None									
Pennsylvania	None									
Rhode Island	Innovation Tax Credit	**Enacted:** January 1, 2007 **Expiration:** December 31, 2016	50% of the qualified investment.	No more than $1.0 million in any 2 year calendar period.	Maximum tax credit of $100,000.	Cannot be claimed against Individual Income Tax	No	No	3 Years	No
South Carolina	High Growth Small Business Job Creation Tax Credits	**Implemented:** January 1, 2013 **Expiration:** December 31, 2019	35% of the qualified investment.	$5 million per year	Aggregate tax credits allocated to a investor cannot exceed $100,000 per year.	Individual Income Tax	50% of tax credit can be claimed in the tax year during which the qualified investment is made. The remainder can be claimed in the following year.	No	10 Years	Yes
South Dakota	None									

Table 2 cont. Investment Incentive Tax Credits by State

State	Tax Credit	Enactment/ Expiration	Amount of Tax Credit	Annual Program Cap	Taxpayer/ Business Cap	Qualifying Tax Types	Required Delay before Claim	Refundable	Carry Forward	Transferable
Tennessee	Angel Tax Credit	**Implemented:** January 1, 2017	50% of the qualified investment in low-income counties 33% of the qualified investment in other counties	$3 million in calendar year 2017 $4 million in calendar year 2018 $5 million in calendar year 2019 and each calendar year thereafter	Can only claim $50,000 in credits per year	Hall Income Tax	No	No	5 Years	
Texas	None									
Utah	Life Science and Technology Tax Credits	**Enacted:** 2011	35% of the qualified investment	$300,000 in fiscal year 2017-2018	$350,000 per credit		No	No	No	
Utah	Capital Investment (formerly Fund of Funds)	**Enacted:** January 2006 **Expiration:** December 31, 2019	Contingent on the rate of return.	Program cap of $300 million	None	Unavailable	No	Yes	No	Yes
Vermont	Seed Capital Fund Tax Credit	**Enacted:** January 1, 2014 **Expiration:** December 31, 2019	20% of the qualified investment	None	$1.4 million total credits for life of program	Individual Income Tax Corporate Income Tax Bank Franchise Tax Insurance Premiums Tax	Tax credit claimed in a particular year is limited to the lesser of four percent of the contribution (one fifth of the 20% credit) or fifty percent of last year's tax liability	No	4 Years	No

Table 2 cont. Investment Incentive Tax Credits by State

State	Tax Credit	Enactment/ Expiration	Amount of Tax Credit	Annual Program Cap	Taxpayer/ Business Cap	Qualifying Tax Types	Required Delay before Claim	Refundable	Carry Forward	Transferable
Virginia	Qualified Equity and Subordinated Debt Investments Tax Credit	**Enacted:** January 1, 2009	50% of the qualified investment.	$5 million per calendar year - one half reserved for commercialization investments	Maximum tax credit of $50,000 per taxpayer per year.	Individual Income Tax Fiduciary Tax	No	No	15 Years	No
Washington	None									
West Virginia	None									
Wisconsin	Angel Tax Credit	**Enacted:** July 1, 2004	25% of the qualified investment.	None	Businesses can receive up to a total of $8 million in tax credit-eligible cash equity investment. It does not matter which tax credit program the investor uses as long as the total qualifying investments do not exceed $8 million.	Individual Income Tax (individual investor or group of investors)	No	No	15 Years	No
Wisconsin	Early Stage Seed Investment Tax Credit	**Enacted:** July 1, 2004	25% of the qualified investment.	None	Businesses can receive up to a total of $8 million in tax credit-eligible cash equity investment. It does not matter which tax credit program the investor uses as long as the total qualifying investments do not exceed $8 million.	Individual Income Tax Corporate Income Tax Fiduciary Tax (Must be venture fund)	No	No	15 Years	Yes
Wyoming	None									

Table 3. Innovation Fund Tax Credit Awards by Fiscal Year of Award, FY 2014 to FY 2018

Fiscal Year of Award	Number of Awards	Share of Award Count	Sum of Awards	Share of Award Amount	Average Award	Sum of Associated Investment
2014	47	13.3%	$890,590	12.6%	$18,949	$3,562,360
2015	65	18.4%	$2,766,728	39.3%	$42,565	$11,066,912
2016	92	26.1%	$1,652,922	23.5%	$17,967	$6,611,688
2017	77	21.8%	$1,066,888	15.1%	$13,856	$4,267,552
2018*	72	20.4%	$670,447	9.5%	$9,312	$2,681,788
Total	353	100.0%	$7,047,575	100.0%	$19,965	$28,190,300

Source: Iowa Department of Revenue, Tax Credit Award, Claim, and Transfer Administration System (CACTAS) through December 2017
* FY 2018 awards are incomplete.

Table 4. Innovation Fund Tax Credit Awards by Tax Type, FY 2014 to FY 2018

Tax Type of Original Award	Number of Awards	Number of Unique Awardees	Share of Award Count	Sum of Awards	Share of Award Amount	Average Award	Sum of Associated Investment
Corporation Income Tax	57	10	16.1%	$1,824,315	25.9%	$32,006	$7,297,260
Fiduciary Income Tax	57	9	16.1%	$362,625	5.1%	$6,362	$1,450,500
Individual Income Tax	203	43	57.5%	$2,669,648	37.9%	$13,151	$10,678,592
Insurance Premium Tax	11	3	3.1%	$679,756	9.6%	$61,796	$2,719,024
Moneys and Credits Tax	25	3	7.1%	$1,511,231	21.4%	$60,449	$6,044,924
Total	353	68	100.0%	$7,047,575	100.0%	$19,965	$28,190,300

Source: Iowa Department of Revenue, Tax Credit Award, Claim, and Transfer Administration System (CACTAS) through December 2017
Note: FY 2018 awards are incomplete.

Table 5. Innovation Fund Tax Credit Awards by Residency Status, FY 2014 to FY 2018

Resident Status	Number of Awards	Share of Award Count	Sum of Awards	Share of Award Amount	Average Award	Sum of Associated Investment
Resident	318	90.1%	$6,883,828	97.7%	$21,647	$27,535,312
Non-Resident	35	9.9%	$163,747	2.3%	$4,678	$654,988
	353	100.0%	$7,047,575	100.0%	$19,965	$28,190,300

Source: Iowa Department of Revenue, Tax Credit Award, Claim, and Transfer Administration System (CACTAS) through December 2017
Note: FY 2018 awards are incomplete.

Table 6. Innovation Fund Tax Credit Claims by Fiscal Year of Claim, FY 2015 to FY 2018

Fiscal Year of Claim	Number of Claims	Share of Claims Count	Sum of Claims	Share of Claims Amount	Average Claim	Sum of Carry-Forward
2015	76	17.3%	$1,073,386	21.9%	$14,124	$126,688
2016	151	34.4%	$2,196,202	44.8%	$14,544	$683,176
2017	160	36.4%	$1,129,021	23.0%	$7,056	$508,526
2018*	52	11.8%	$504,812	10.3%	$9,708	$129,162
Total	439	100.0%	$4,903,421	100.0%	$11,170	

Source: Iowa Department of Revenue, Tax Credit Award, Claim, and Transfer Administration System (CACTAS) through December 2017
* FY 2018 claims are incomplete.

Table 7. Innovation Fund Tax Credit Claims and Carryforwards by Tax Year, TY 2013 to TY 2016

Tax Year	Amount of Claims Carried Forward from Prior Year	Amount of New Tax Credits	Total Amount of Tax Credits Available	Amount of Tax Credits Claimed	Amount of Tax Credits Carried Forward to Next Tax Year
2013	$0	$31,600	$31,600	$25,598	$6,002
2014	$6,002	$2,781,170	$2,787,172	$2,354,305	$474,440
2015	$365,827	$1,661,037	$2,026,864	$1,491,007	$602,288
2016*	$353,963	$942,584	$1,296,547	$1,032,511	$364,822
Total				$4,903,421	

Source: Iowa Department of Revenue, Tax Credit Award, Claim, and Transfer Administration System (CACTAS) through October 2017
* Tax year 2016 claims are incomplete.

Table 8. Innovation Fund Tax Credit Claims by Tax Type of Claim, FY 2015 to FY 2018

Tax Type of Claim	Number of Claims	Share of Claims Count	Sum of Claims	Share of Claims Amount	Average Claim
Corporation Income Tax	15	3.4%	$450,896	9.2%	$30,060
Fiduciary Income Tax	61	13.9%	$40,050	0.8%	$657
Individual Income Tax	331	75.4%	$2,770,299	56.5%	$8,369
Insurance Premium Tax	13	3.0%	$802,501	16.4%	$61,731
Moneys and Credits Tax	19	4.3%	$839,675	17.1%	$44,193
Total	439	100.0%	$4,903,421	100.0%	$11,170

Source: Iowa Department of Revenue, Tax Credit Award, Claim, and Transfer Administration System (CACTAS) through October 2017
Note: FY 2018 claims are incomplete.

Table 9. Percent of Innovation Fund Tax Credit Awards Claimed by Year of Investment, 2013 to 2017

Year of Investment	Tax Credit Awarded	Percent Claimed in FY 2015	Percent Claimed in FY 2016	Percent Claimed in FY 2017	Percent Claimed in FY 2018	Total Claimed to Date
2013	$73,190	85.1%	14.9%	0.0%	0.0%	100.0%
2014	$3,202,001	31.6%	47.3%	4.2%	1.0%	84.1%
2015	$2,032,591	0.0%	33.0%	32.4%	14.5%	79.9%
2016	$1,104,002	0.0%	0.0%	30.4%	15.9%	46.4%
2017*	$539,486	0.0%	0.0%	0.0%	0.0%	0.0%

Source: Iowa Department of Revenue, Tax Credit Award, Claim, and Transfer Administration System (CACTAS) through October 2017
* Credits issued for investments made in 2017 cannot yet be claimed.

Table 10. Innovation Fund Tax Credit Transfers by Year of Award, FY 2014 to FY 2018

Fiscal Year of Award	Number of Awards	Number of Awards Transferred	Sum of Awards	Sum of Awards Transferred	Share of Awards Transferred
2014	47	7	$890,590	$75,021	8%
2015	65	21	$2,766,728	$580,642	21%
2016	92	28	$1,652,922	$485,598	29%
2017	77	19	$1,066,888	$259,603	24%
2018*	72	0	$670,447	$0	0%
Total	353	75	$7,047,575	$1,400,864	20%

Source: Iowa Department of Revenue, Tax Credit Award, Claim, and Transfer Administration System (CACTAS) through October 2017
* FY 2018 transfers are incomplete.

Table 11. Innovation Fund Tax Credit Transfers by Tax Type of Transferor, FY 2014 to FY 2018

Tax Type of Award to Transferor	Tax Type of Transferee	Number of Transfers	Share of Transfer Count	Amount of Transfers	Share of Transfer Amount	Average Transfer
Corporation Income Tax	Individual	11	14.7%	$131,947	9.4%	$11,995
Individual Income Tax	Individual	60	80.0%	$716,188	51.1%	$11,936
Moneys and Credits Tax	Individual	4	5.3%	$552,729	39.5%	$138,182
		75	100.0%	$1,400,864	100.0%	$18,678

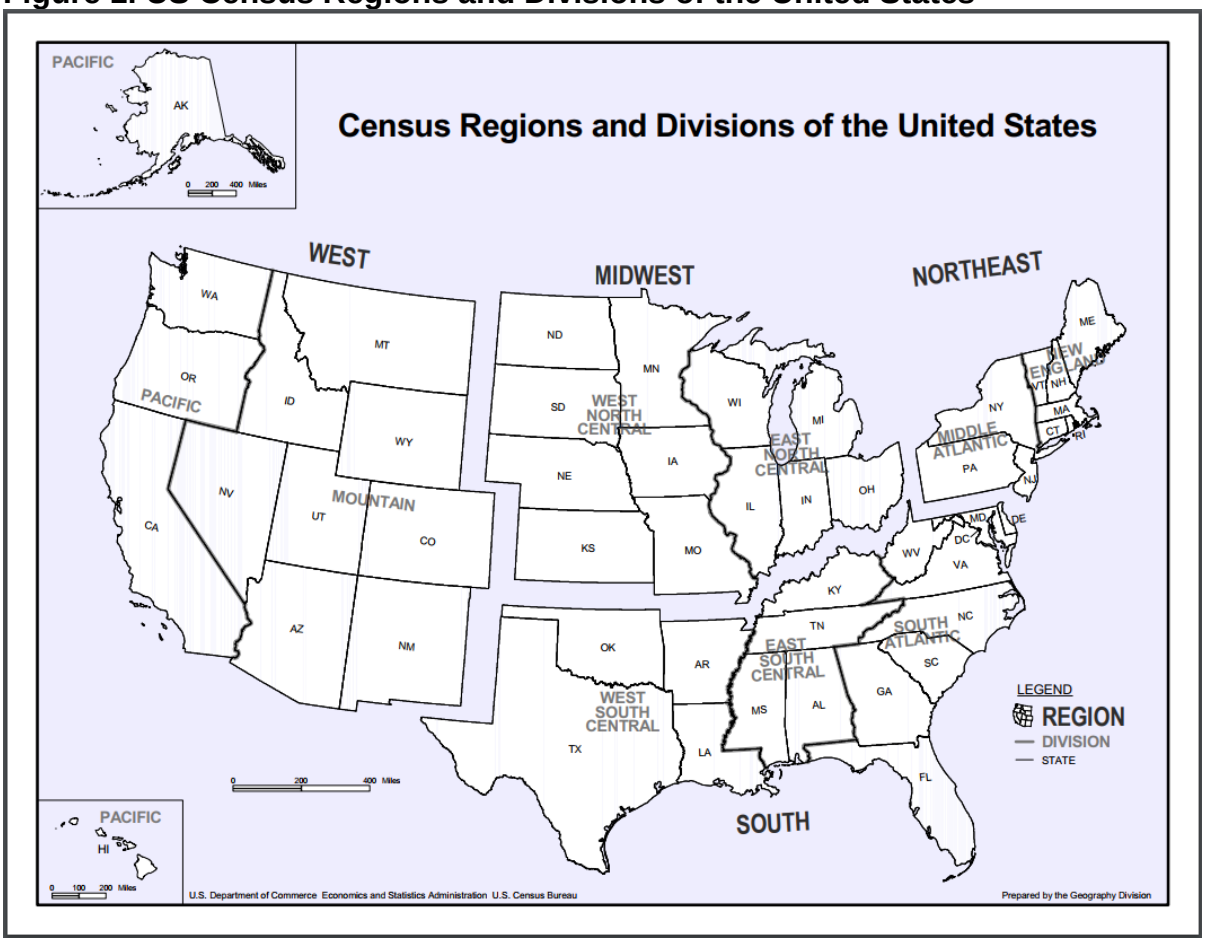
Source: Iowa Department of Revenue, Tax Credit Award, Claim, and Transfer Administration System (CACTAS) through October 2017
Note: FY 2018 transfers are incomplete.

Table 12. Innovation Fund Tax Credit Transfers Detail, FY 2014 to FY 2018

Total Number of Awards Transferred	75
Total Dollar Value of Awards Transferred	$1,400,864
Total Number of Unique Transferors	12
Average Number of Awards Transferred per Transferor	6.42
Average Value of Awards Transferred per Transferor	$116,739
Total Number of Transferees	18
Average Count of Transfers per Transferee	4.28
Average Value of Transfers per Transferee	$77,826

Source: Iowa Department of Revenue, Tax Credit Award, Claim, and Transfer Administration System (CACTAS) through October 2017
Note: FY 2018 transfers are incomplete.

Figure 1. US Census Regions and Divisions of the United States



Source: US Census Bureau

Table 13. Summary Statistics of PricewaterhouseCoopers and Kauffman Foundation Data, CY 2016

Source	Count of Investment Deals (CY 2016) PricewaterhouseCoopers			Dollar Amount of Investment Deals ($ mil, CY 2016) PricewaterhouseCoopers		
	Mean	Median	Total	Mean	Median	Total
All States (plus DC)	101	23	5,153	$1,194.2	$99.3	$60,903.7
Contiguous 48 States	106	27	5,110	$1,263.4	$107.0	$60,644.4
Midwest States	34	27	410	$196.9	$98.2	$2,362.8
	Actual			Actual		
Iowa	4			$19.4		

Source	Average Startup Growth Rate over Five Years by State (CY 2016) Kauffman Foundation		Percent of Small Businesses that Scale-up by State (CY 2016) Kauffman Foundation		Number of High Growth Firms per 100,000 Employer Firms by State (CY 2016) Kauffman Foundation	
	Mean	Median	Mean	Median	Mean	Median
All States (excl. DC)	57.4%	56.6%	1.4%	1.4%	59	55
Contiguous 48 States	57.3%	56.6%	1.4%	1.4%	61	56
Midwest States	50.4%	51.1%	1.4%	1.4%	51	51
	Actual		Actual		Actual	
Iowa	44.9%		1.4%		33	

Source: PricewaterhouseCoopers, Kauffman Foundation

Table 14. Regression Coefficients from State-level Analysis, CY 2010 to 2016 – Effect Measured Starting with Implementation Date of Credit

Reg No.	Dependent Variable	Geography	Control Type	Coefficient	P-value	Observations
1	Count of Deals	US	State Fixed Effects	0.190	0.287	336
2	Count of Deals	US	Regional Dummies	-1.688	0.001	336
3	Count of Deals	US	Division Dummies	-0.747	0.102	336
4	Count of Deals	Midwest	None	-0.336	0.731	84
5	Average Deal	US	State Fixed Effects	0.327	0.706	327
6	Average Deal	US	Regional Dummies	-0.220	0.469	327
7	Average Deal	US	Division Dummies	-0.239	0.446	327
8	Average Deal	Midwest	None	-0.697	0.187	80
9	Startup Rate	US	State Fixed Effects	-0.101	0.464	336
10	Startup Rate	US	Regional Dummies	0.001	0.968	336
11	Startup Rate	US	Division Dummies	-0.010	0.564	336
12	Startup Rate	Midwest	None	-0.019	0.545	84
13	Scale-up Share	US	State Fixed Effects	-0.004	0.000	336
14	Scale-up Share	US	Regional Dummies	0.001	0.000	336
15	Scale-up Share	US	Division Dummies	0.001	0.002	336
16	Scale-up Share	Midwest	None	0.002	0.000	84
17	High Growth Density	US	State Fixed Effects	19.707	0.073	336
18	High Growth Density	US	Regional Dummies	9.830	0.008	336
19	High Growth Density	US	Division Dummies	10.896	0.003	336
20	High Growth Density	Midwest	None	6.331	0.166	84

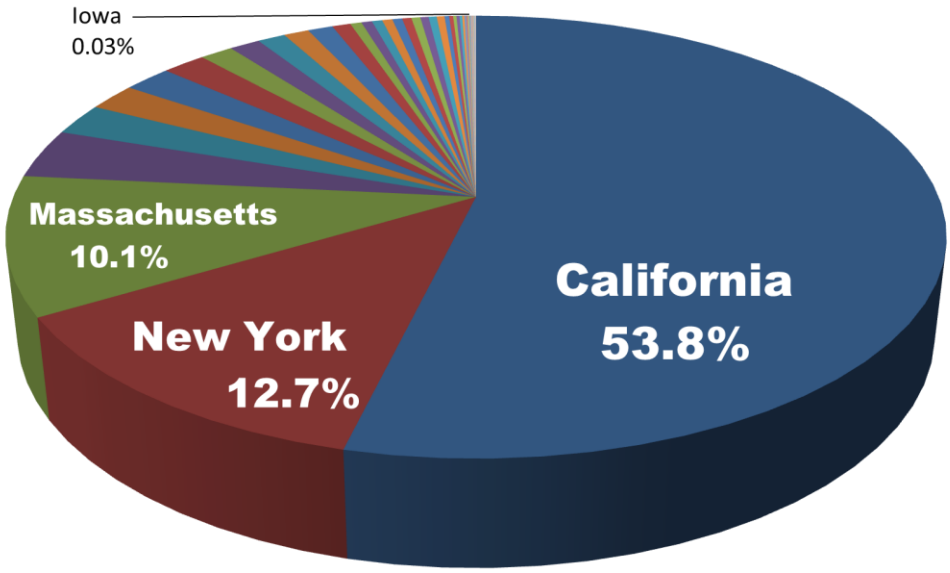
Note: Significant p-values (p<0.05) and associated coefficients are highlighted in gray.

Table 15. Regression Coefficients from State-level Analysis, CY 2010 to 2016 – Effect Measured Starting One Year After Implementation Date of Credit

Reg No.	Dependent Variable	Geography	Control Type	Coefficient	P-value	Observations
1	Count of Deals	US	State Fixed Effects	0.206	0.206	336
2	Count of Deals	US	Regional Dummies	-1.586	0.001	336
3	Count of Deals	US	Division Dummies	-0.791	0.077	336
4	Count of Deals	Midwest	None	-0.595	0.530	84
5	Average Deal	US	State Fixed Effects	0.289	0.715	327
6	Average Deal	US	Regional Dummies	-0.211	0.486	327
7	Average Deal	US	Division Dummies	-0.219	0.480	327
8	Average Deal	Midwest	None	-0.463	0.760	80
9	Startup Rate	US	State Fixed Effects	-0.127	0.311	336
10	Startup Rate	US	Regional Dummies	0.004	0.838	336
11	Startup Rate	US	Division Dummies	-0.006	0.713	336
12	Startup Rate	Midwest	None	-0.026	0.388	84
13	Scale-up Share	US	State Fixed Effects	-0.006	0.000	336
14	Scale-up Share	US	Regional Dummies	0.001	0.000	336
15	Scale-up Share	US	Division Dummies	0.001	0.001	336
16	Scale-up Share	Midwest	None	0.002	0.000	84
17	High Growth Density	US	State Fixed Effects	29.738	0.003	336
18	High Growth Density	US	Regional Dummies	8.308	0.025	336
19	High Growth Density	US	Division Dummies	9.532	0.008	336
20	High Growth Density	Midwest	None	4.438	0.318	84

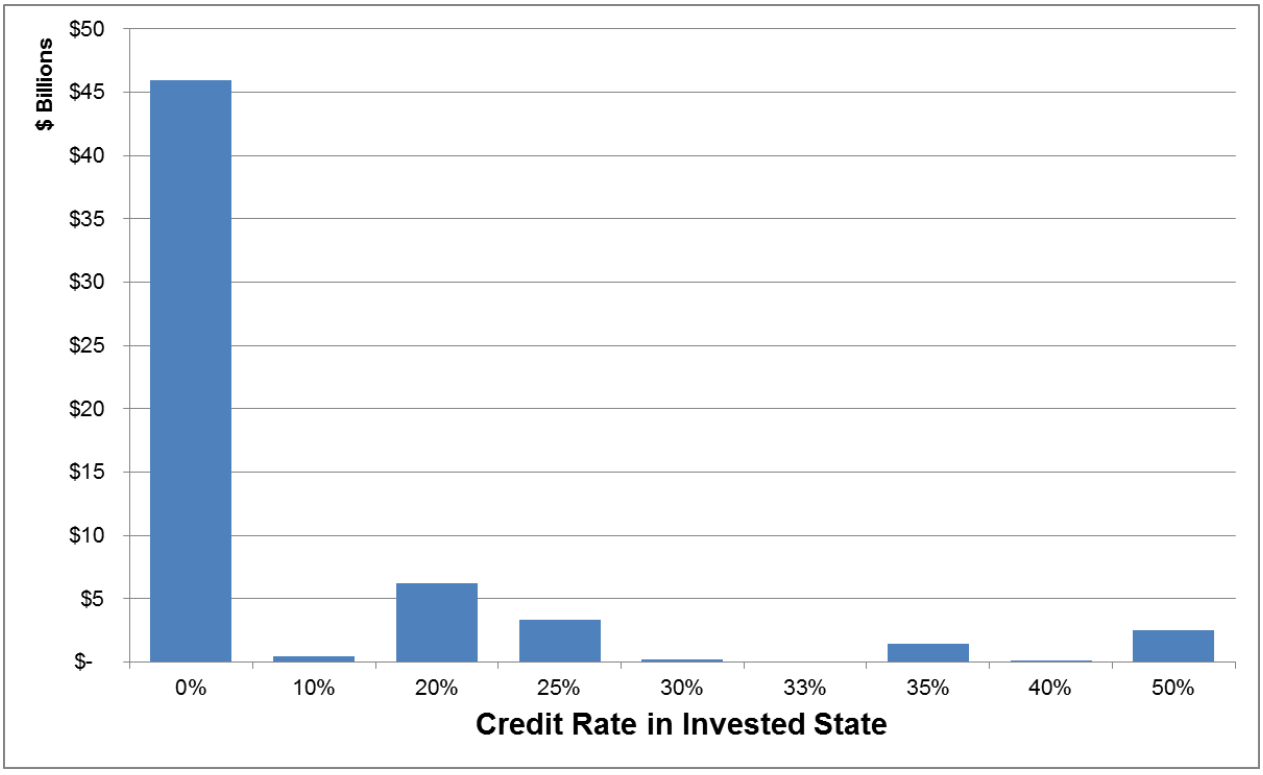
Note: Significant p-values (p<0.05) and associated coefficients are highlighted in gray.

Figure 2. Distribution of Venture Capital Investment by Invested State in CY 2016



Source: PricewaterhouseCoopers

Figure 3. Total Venture Capital Investment by Tax Credit Rate in Invested State, CY 2016



Source: PricewaterhouseCoopers, various state agency websites