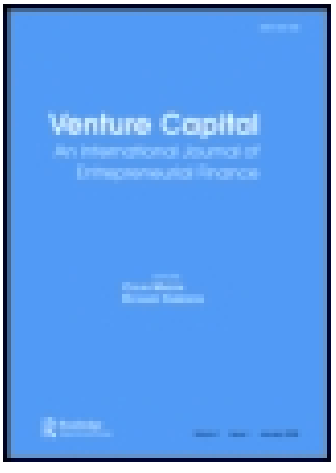

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The costs and benefits of early-stage business tax credits: a case study of two US states

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The costs and benefits of early-stage business tax credits: a case study of two US states

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Tax credits for investment in early stage business are a common policy measure aimed at fostering innovation and entrepreneurship. Although credits can *theoretically* play an important role in offsetting risk and boosting early-stage investment, there are few *empirical* findings to back the theory. This paper adds to the debate by looking at two US tax credit programs: those of Maryland and Wisconsin. The net economic impact of these states' programs is estimated using the regional input–output modeling system (RIMS II).

Keywords: state tax policy; innovation; entrepreneurship; economic impact

Introduction

An important aspect of sustainable economic growth is an innovative start-up sector. Innovation flourishes in an environment that encourages creativity, change, and flexibility. This includes aspects such as effective bankruptcy laws, multiple sources of finance, tax breaks for R&D, and good government service delivery. When these are inadequate, a targeted source of government funding can help 'fill the gap,' while the long-term issues are addressed. However, it is important to remember that public funding is at best a catalyst. Innovative enterprises are often reluctant to seek public funding due to the bureaucracy involved and to prevent exposure of their technology. The most important links with respect to innovation are business-to-business ones (either with other companies, universities, suppliers, or customers), which are difficult for governments to simulate (Blankley and Moses 2009).

It is therefore better for the public sector to avoid direct funding and instead create an enabling environment through the encouragement of an alternative finance industry and a reduction in the bureaucracy that slows start-up growth (Lerner 2002; Murray 2007). This can be achieved with both direct (tax credits and capital gain reductions) and indirect measures (entrepreneur coaching and venture forums). To best address gaps in the market, public policy should be directed to *early* stage financing and business (Sohl 2010). *Early*-stage financing is increasingly necessary given the shortened product life cycle – businesses can only succeed by moving rapidly from ideas to product distribution. Banks do not provide this type of funding; family and friends rarely have enough; and the public stock market is only an option for established firms. These financing options have become even more limited in the aftermath of the 2007–2009

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recession (Harrison and Baldock 2015). As the mortgage crisis gathered steam and the private sector deleveraged, home equity declined and a larger percentage of savings ended up under institutional management (which is typically invested in publicly traded stocks). Moreover, the post-crisis regulatory environment restricted bank lending to 'risky' sectors. [Start-ups face disproportionate risk due to the uncertainty of commercial feasibility, market acceptance, scalability, and information asymmetries (Nwosu 2010)]. A recent capital access study by Pepperdine (2015) bears this out. Sixty-nine percent of start-ups said they had difficulty raising debt, and only 39% actually managed to secure a bank loan.

Public policy and tax credits

Federal bodies and state governments are beginning to recognize the need for more start-up finance options. As stated in a recent NSAVF report:

> Entrepreneurs always have led in building the United States economy. But never has the pace of new business development been so fast or the competition so intense. To win in the race for wealth and jobs, the 50 states have been called upon to serve entrepreneurs and help create an environment where new business ventures can thrive. Part of this challenge is ensuring that entrepreneurs have access to the seed and venture capital they need to launch and grow their companies. (NSAVF 2006, 1)

One of the most common public support measures is a tax credit for investment in early stage business. Investors and start-ups tout the advantages of tax credits, mainly that they generate more tax revenue than they cost. Further potential benefits include the generation of social returns through high-quality job creation, regional development, and product innovation; the channeling of funds and expertise to start-ups; and an administration that is relatively simple and cost-effective. Moreover, credits can target *high-growth* start-ups. Without a credit, investors often invest more conservatively in later-stage and/or public companies (NSAVF 2006; Nwosu 2010). Credits can also be more effective than a capital gains tax reduction in stimulating early-stage companies, since investors get the credit up front whether the investment realizes a gain or not (National Angel Organization 2013). A 2013 paper by Bell, Witbank, and Hendon supports this 'credit boost'. In their paper, 22 out of 29 states that implemented an angel tax credit program displayed an increase in entrepreneurial activity within two years.

Some policy-makers are more skeptical of credits, believing that they do not improve deal quality and so increase the size but not the *number* of completed deals. Furthermore, recent studies show that the benefits of investor tax credits may depend on a number of factors such as the credit rate and whether the credit is temporary or permanent. For instance, Vermont's 10% investment credit was enacted in 2004 and no credits were claimed. In Hawaii, only $162,000 was claimed by 23 taxpayers in its credit's first year. In 2002, over $26 million were claimed after the state increased the rate from 10% to 100% (Hayter 2008).

There is also the argument that investment tax credits reward not only new angels but also those already actively investing, lowering their benefit–cost ratio. [At the same time, however, they do attract new investors through marketing by public officials, attorneys, and accountants (Hayter 2008)].

Finally there are federal tax requirements that can reduce the benefit of state credits to investors. If the investor is an itemizer[1], the credit will reduce the itemized deduction for state income tax, raising federal tax by the federal marginal tax rate multiplied by the state credit. For a top bracket taxpayer, this reduces the – of the state credit by 35%. For

non-itemizers and for taxpayers subject to the federal alternative minimum tax, there is no effect (Minnesota House Research Department 2010).

On balance state tax credits can *theoretically* play an important role in offsetting some of the risk inherent in early-stage investment. There are few *empirical* findings to back the theory, however, due to the lack of data and the difficulty of measuring economic impact. The difficulty comes in distinguishing the net incentive effect of the credit itself. Even if this can be isolated, it is tricky to parse out the impact of mitigating external factors and poor program design. The importance of effective early-stage policy means that attempts should still be made to surmount some of these obstacles and make a rough attempt at empirics. This paper aims to do that by looking at two state credit programs.

The analysis begins with an overview of all the state credit offerings. It then offers a more in-depth analysis of two programs, in particular, those of Maryland and Wisconsin. The net economic impact of these states' programs is estimated using the regional input–output modeling system (RIMS II). The paper concludes with an assessment of the value of these programs.

Overview of state tax credits in the USA

Currently, 27 states have some form of early-stage capital tax credit, the mode being 25% of invested capital.[2] The majority of these states restrict the quantity that can be claimed, either per investor, per business or per investment generating the credit. There are similar restrictions relating to the quantity of equity that can be held in any single company, generally around the 50% range. Most programs also contain stipulations relating to number of local employees; type of activity (high technology, emerging technology, biosciences, etc); the ability to carry unclaimed credits over to following years; the holding period that investors have to hold shares in order to claim credit; the ability to transfer credits to other tax payers; and recapture provisions if these stipulations are not met[3]. Unfortunately, although many programs have annual filing conditions for investors and businesses, very few require the authority in charge to collect data or publish reports.[4] More data would help in specifying the role credits play in state economies.

Case studies: methodology

As noted in the introduction, this paper will attempt to estimate the net economic impact of a sample of state programs using the regional industry-specific input–output modeling system (RIMS II). Final demand RIMS *Type II* are used. These account for the direct, indirect, and induced effect of an initial change in final demand. In other words, they account for spending on initial inputs, spending on inputs in supporting industries, and further spending generated by the increased income of employees in all involved industries. This study will look at the change in gross output, value added, earnings, and employment following an initial change in investment (BEA 2013).

Prudent use of RIMS II multipliers relies on careful delineation of the parameters used and the assumptions made.[5] This study uses *state* RIMS multipliers. Although some of the start-ups may initially have a more localized impact, they are technology intensive and characterized by rapid growth. As such, it is felt that a *state* input and output market would be the most appropriate regional designation. Despite this, it is recognized that workers will probably spend their earnings more locally. The estimated figures may

therefore inflate the state impact as the consumption part of the boost will only be fully realized in certain counties.

Measuring initial changes in final demand is always tricky in RIMS calculations. Wisconsin and Maryland provide four figures: total credits awarded, the initial investment that generated this credit, further private capital leveraged, and grants awarded. A *federal* grant would be a final demand change to a state and a boost to the state economy. A *state* grant would not, since it would be a diversion of funds that would otherwise be used elsewhere. Since there was no breakdown as to whether the grants were federal or local, this figure was not included in the calculation. The final stimulus figures are therefore *understated* as it is likely that at least some of the awards leveraged by the credit come from federal sources. As such, only the *private* capital figure was used. This was adjusted down using the findings from a recent Minnesota report. In the report, 48% of surveyed angels would not have made their investment without a 25% credit and 34% would have invested less.[6] Some of this private capital may be displaced from alternative investment in the state, but it is likely that much of this would have been otherwise placed in national capital markets (Minnesota Department of Revenue 2014).

Maryland

Maryland's Biotechnology Investment Tax Credit can be claimed by investors in Qualified Maryland Biotechnology Companies (QMBCs). Program funds totaled $6 million a year from 2006 to 2010, $8 million from 2011 to 2013, and $10 million in 2014. The value of the credit is equal to 50% of an eligible investment made in a QMBC. The maximum amount of the credit cannot exceed $250,000 for qualified investors and the maximum amount of credit for total investors in a QMBC cannot exceed 15% of the program's fiscal year funding. During the last eight years, the program has attracted $118 million dollars in total capital investment into QMBCs.

The figures for Maryland's Program are given in Table 1. The figures for leveraged capital, grants, employees, and salary are those for a sample of the overall recipients. Table 2 therefore shows an estimate of what the figures would be if these averages were applied to every firm in the program, not just those in the sample. Moreover, the averages for 2009–2013 have been used to estimate the complete dataset for 2006–2008. Due to differing economic conditions in earlier years, these estimates are biased. However since the 2009–2013 period includes the peak of the recession, it is expected that these figures are biased *downward*. As such, the estimate should be a conservative one. In fact to be even more prudent, the lowest average salary ($78,670) was used as the average salary for all the years in the 2006–2008 period.

Table 1. Recorded Maryland figures.

	2006	2007	2008	2009	2010	2011	2012	2013
Number of companies	20	21	18	22	13	17	18	22
Credits issued ($M)	5.95	6.25	6.28	4.67	6.25	7.78	7.96	8.92
Private capital leveraged ($M)				29.54	16.5	3.48	27.42	15
Grants ($M)				36.1	65	34	57	94.5
Total local employees				224	109	134	129	185
New reported hires				129	56	62	87	102
Average salary ($)				78,670	86,057	88,237	88,000	84,000

Table 2. Maryland estimates over all years and businesses in program.

	2006	2007	2008	2009	2010	2011	2012	2013
Number of companies	20	21	18	22	13	17	18	22
Credits issued ($M)	5.95	6.25	6.28	4.67	6.25	7.78	7.96	8.92
Private capital leveraged ($M)	20.16	21.17	18.14	50	30.64	11.83	38.97	20.63
Grants ($M)	129	141.9	116.1	53	30.64	64	114	231
Total local employees	192	202	173	246	121	163	170	185
New hires	140	147	126	166	83	118	144	129
Average salary ($)	78,670	78,670	78,670	78,670	86,057	88,237	88,000	84,000

RIMS Type II biotech multipliers (industry code: 325414) for Maryland were used to generate Table 3. This gives an idea of the direct, indirect, and induced effect of the Maryland Program. To determine the final demand change, the total private capital figures were first multiplied by 0.48, the average percentage of new capital spurred by the credit itself and obtained from the aforementioned Minnesota report. This is a conservative estimate since, as noted, it does not include angels who would have still invested without a credit but in smaller amounts, nor government grants.

From Table 3, one can see that even a conservative estimate shows a substantial boost in leveraged capital, local employment, earnings, and value added. Estimated tax revenue is provided using a Maryland personal income tax rate of 4.95%, and corporate rate of 8.25%. Realized tax revenue should be quite a bit higher than these figures due not only to the omission of government grants and partial angel investment, but also to the inability to calculate sales taxes from the figures provided. Moreover, since Maryland's tax credit is twice as large as that of Wisconsin, using the 0.48% figure from Wisconsin report probably underestimates how much revenue was *directly* stimulated by the incentive.

Wisconsin

Wisconsin's Act 255 Qualified New Business Venture (QNBV) Program was initiated in 2005, and allows early-stage businesses developing innovative products, processes, or services to be designated as QNBVs. Investments in QNBVs made by angel investors, angel investment networks, and qualified venture capital funds receive a 25% tax credit. Businesses can receive up to a total of $8 million in tax-eligible cash equity investment and there is no limit on the amount of credits investors can claim (WEDC 2013). In total, the program has distributed $58.8 million in tax credits ($235.2M in qualified investment), aided 237 companies, and attracted a further $500 million in capital and $113 million in grants. 1102 full-time and 220 part-time positions were created, with an average salary of $76,000 and total payroll of $84 million.

Table 3. RIMS estimates of total economic impact stimulated solely by the credit.

	2006	2007	2008	2009	2010	2011	2012	2013
Number of companies	20	21	18	22	13	17	18	22
Credits issued ($M)	5.95	6.25	6.28	4.67	6.25	7.78	7.96	8.92
Total private capital leveraged ($M)	31.01	32.57	29.72	57.15	41.66	26.6	53.01	37.29
New local jobs spurred by credit	238	250	228	438	319	204	406	286
Value added spurred by credit ($M)	15.03	15.79	14.41	27.70	20.19	12.89	25.70	18.08
Earnings spurred by credit ($M)	7.11	7.47	6.81	13.10	9.55	6.10	12.15	8.55
Tax on earnings and value added ($M)	1.59	1.67	1.53	2.93	2.14	1.37	2.72	1.91

Table 4. Recorded Wisconsin figures.

	2005	2006	2007	2008	2009	2010	2011	2012
Number of companies	44	60	76	89	106	125	138	160
Credits issued ($M)	3.1	3.8	4.7	7.4	8.8	7.6	11.3	12.1
Private capital leveraged ($M)	24.3	28.9	51.6	68.1	61.5	144.6	72.4	116.3
Grants ($M)				5.4	8.1	29.4	33.2	37.1
Total employees	339	384	461	655	846	1107	1206	1476
New hires							207	210
New projected hires							195	197
Average salary ($)				78,582	76,627	83,346	76,564	76,581

Table 5. 2012 Industry breakdown.

	Biotech	Healthtech	IT	Nanotech	Energy	Other
Number of companies	13	15	21	3	1	10
Credits issued ($M)	3.5	2	3.4	0.5	0.3	2.1
Private capital leveraged ($M)	36.1	20	32.6	0.2	17.5	9.9
Grants	17.1	1.1	1.1	0.1	5.1	12.7

Table 6. RIMS estimates of total economic impact.

	2012
Number of companies	160
Credits issued ($M)	12.1
Total private capital leveraged ($M)	152.6
New local jobs spurred by credit	1465
Value added spurred by credit ($M)	118.5
Earnings spurred by credit ($M)	58.3
Tax on earnings and value added ($M)	13.79

The figures for Wisconsin's Program are given in Table 4. Detailed numbers are only available for 2012, so the analysis focuses on this period. Unlike Maryland, the QNBV spans a number of technology industries: biotechnology, health technology, information technology (IT), nanotechnology, energy, and 'other' technology. Table 5 breaks the figures down by these sectors. After analyzing the profiles of the individual firms, the following industry classification codes were used: biotech: 325414, healthtech: 541700, IT: 541512, nanotech: 334413, and energy: 335312.[7] For 'other', an average of the multipliers was applied. The results are presented in Table 6.[8] Estimated tax revenue figures are provided using a Wisconsin personal income tax rate of 6.5%, and corporate rate of 7.9%. As with Maryland, Table 6 shows that the credit can result in a substantial boost in leveraged capital, local employment, and earnings. In particular, the generated revenue more than covers the credit outlay.

Conclusion

It appears that credits can produce the desired 'pay-offs' for states. Both Maryland and Wisconsin are recouping benefits from their investment credit policy. This is especially true when you consider that many of these benefits will continue for a number of years.

It is important to note, however, that these particular programs are fairly well designed and managed. This is not the case for all states. Given the potential of incentives, it is vital that policy-makers educate themselves as to best practice, and are not driven by short-term political motives when designing programs. This is especially true because poor results can taint the view of incentives in general.

To be effective, incentives should be transparent and uncomplicated, so that they not impose too great an administrative burden on start-ups and investors. They should also be generous enough to stimulate investment but not so generous as to eliminate all investment risk.[9] This ensures that only truly viable projects are financed. To prevent abuse, they should also have prudent eligibility criteria for investors (for accredited arms-length investors) and investments (for equity and near equity held for a sufficient period of time). This could also involve restricting fund use for the payment of dividends, loans, and/or redemption of shares. Lastly and importantly, an incentive policy should require the collection of metrics about the program. Comprehensive data would allow for more detailed research in this highly important area.

Notes

1. Tax payers in the USA can choose to take a standard deduction, or forego this and itemize specific deductions.
2. For 32% of states the credit is in the 20%–25% range, 26% offer a credit between 30% and 40%, and 25% between 45 and 50%. Eight percent each have a credit lower than 10% and greater than 60%.
3. Average figures for the US states: maximum credit allowed: $2 million; restriction on equity: less than 50%; size/age of start-up at the time of the investment: less than $5 million gross revenue and less than 7 years old; carry-over period: 5 years; holding period: 3 years.
4. From a sample taken from a New York Times series, 'United States of Subsidies', the median state expenditure on seed capital credits is 0.15% of total spending on incentive programs (New York Times, 2012).
5. Assumptions in RIMS: industries use the same proportion of inputs to produce output, backward linkage model, industries uses fixed purchase patterns, all businesses in an industry use the same production process, there are no supply constraints, there is no feedback between regions, and there is no time dimension.
6. The Minnesota figures are bolstered by a survey of angels, conducted by the authors of this paper. In this survey, 69% of respondents claimed that the credit influenced them to invest in more firms or invest more money. The mode increase in investment was around 30% with 24% investing more than this.
7. Code descriptions: 541700 – scientific research and development services, 541512 – computer systems design services, 334413 – semiconductor and related device manufacturing, 335312 – motor and generator manufacturing.
8. As with Maryland, private capital leveraged was first multiplied by 0.48, the average percentage of new capital spurred by the credit itself.
9. Risk for investors is further reduced if credits are transferrable and able to be carried forward.

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