APPENDIX B

MEASURING THE COSTS AND BENEFITS OF HAWAII'S QUALIFIED HIGH TECHNOLOGY BUSINESS (QHTB) INVESTMENT TAX CREDIT

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Final Report
Prepared for the Hawaii State Tax Review Commission
October 20, 2006 FINAL

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Measuring the Costs and Benefits of Hawaii's Qualified High Technology Business (QHTB) Investment Tax Credit

Introduction

In recent years, the State of Hawaii has enacted legislation to encourage the growth of high-technology business in Hawaii. Act 221 (of 2001)[1] provides eligible taxpayers a nonrefundable tax credit of up to $2,000,000[2]. Act 221applies to those taxpayers subject to Hawaii's income, franchise, and/or gross premiums tax who invest in a qualified high technology business (QHTB). [3] Act 215 (of 2004) amended HRS Chapter 235, Section 110.9 and extended the investment tax credit program until 2010.[4]

The purpose of this report is to measure the costs and benefits of Hawaii's qualified high technology business (QHTB) investment tax credit. For purposes of this report, please note that the terms "Act 221 credit", "QHTB tax credit", and "high technology business investment tax credit" will be used interchangeably.

Literature Review

Over the last three decades, state and local taxation has comprised an increasing body of tax research. Hoffman (2002) observes: "50 states with taxing regimes that are in many ways so similar, and yet in many ways very different, provide a ready field laboratory for testing theories about taxation in general".[5]

Fox and Luna (2002) investigated a number of factors that may have influenced the decline in state corporate income tax revenues relative to gross state product since the mid-1980s.[6] Some of these factors include 1) cyclical declines in profits; 2) changes in the federal corporate tax base; 3) state policy actions and 4) corporate tax planning strategies.[7]

State policy actions include: 1) discretionary concessions designed to recruit firms – typically large manufacturers—to the state and 2) incentives built into the tax code.[8] Tax incentives include investment tax credits, property tax credits, and/or employment tax credits.[9]

The debate over the extent to which tax incentives influence a firm's decision to locate in a given state can be summarized as follows: "Legislators often argue there is no lost revenue from these incentives because the states are giving away revenue they would not have otherwise had. Others argue that the businesses are doing what they would have done anyway, and that tax incentives have done nothing to attract new businesses but have contributed to a significant decline in state tax revenues." [10] In another study, Wasylenko (1997) found that taxes had an effect –albeit a small one-- upon a firm's decision to locate in a given state. [11]

In "The Disappearing State Corporate Income Tax", Cornia, Edminston, Sjoquist, and Wallace (2005) examined alternative explanations for the decline in state corporate income taxes relative to the state economy.[12] The authors surveyed state tax administrators, examined individual tax returns from Georgia and Utah, and examined tax panel data.[13] The authors found that corporate tax planning and economic factors account for much of the relative decline, and that state tax policy changes are important factors.[14] However, federal tax changes had only a modest effect on state corporate income taxes during this period.[15]

In 2003, the Multistate Tax Commission (MTC) published a study, "Corporate Tax Sheltering and the Impact on State Corporate Income Tax Revenue Collections".[16] This study contended that, in 2001, corporations sheltered between $8 billion and $12 billion in state corporate income taxes.[17]

However, the Council of State Taxation criticized the MTC study in an article entitled "Abusive Tax Shelters Should Be Curtailed, but the Multistate Tax Commission's Exaggerated Numbers Aren't Helpful to the Debate".[18] The Council on State Taxation accused the MTC study of "1) misapplying the [prior] research findings used to estimate the amount of discretionary state legislative reductions in corporate income taxes; and 2) attributing all of the unexplained reduction in corporate income tax collections to 'tax sheltering'".[19]

The Council on State Taxation article also noted that, in 2002, businesses paid $391 billion in total state and local business taxes.[20] Of this amount, corporate income taxes represented only 9%. [21] To focus solely upon state corporate income taxes is, in the Council's view, "to miss the forest for the trees". [22]

In "Managing Annual Accounting Reports to Avoid State Taxes: An Analysis of Property-Casualty Insurers", Petroni and Shakleford (1999) examined the influence of state tax rates --such as premium taxes and income taxes—on the accounting allocation of income by multistate property/casualty insurers. [23] By examining the premium-loss ratios that multistate insurers report to state tax authorities, the authors' findings suggest that these insurers shift premiums to states with lower premium (income) taxes and/or shift losses to states with higher income taxes. [24]

"Business Climate" Studies[25]

A number of studies rank the ability of a state to encourage economic development in today's economy. The Development Report Card (2006) graded all states according to three indexes: performance, business vitality, and development capacity.[26] The State of Hawaii received the grades of "C", "F" and "F", respectively.

In 2002, the Milken Institute State Technology and Science Index ranked Hawaii 42nd in the nation for its "ecosystem of economic development and sustainability".[27] In both 2004 and 2005, the Milken Institute's Cost of Doing Business Index ranked Hawaii as the most expensive state in the nation in which to do business.[28] Hawaii's business costs exceeded the national average by 43 percent.[29]

In a study on business climate by Forbes magazine, Hawaii ranked 42nd in the nation.[30] Its rankings in six individual categories are:

1) business costs……..…….50th;
2) labor…….....11th;
3) regulatory environment……38th;
4) economic climate……5th;
5) growth prospects……..37th;
6) quality of life……44th.

However, it should be noted that Hawaii has improved its ranking when compared with prior Forbes magazine studies.[31]

Tax Incentive Programs Designed to Attract Venture Capital

Many states have enacted tax incentive programs. The goals of these programs typically include creating jobs, nurturing certain industries, and diversifying the economy.

Reviews of tax incentives for business development note the adverse consequences that can result from the use of tax incentives.[32] They include: 1) erosion of the tax base resulting from qualifying investments that would otherwise have been undertaken and from abuse of provisions in the relevant laws and regulations; 2) distortion of

resource allocation by encouraging some activities over others as a result of their special tax advantages (which also works against the efficiency principles of having a broad tax base and having low tax rates); and 3) encouragement of corruption and rent-seeking activity. Increased administrative resources are also needed to administer tax incentives.

There is consensus that government intervention in the market is justifiable in the presence of market failure. An investment that generates a positive externality for the economy may be underprovided by the market. A tax incentive would work to encourage more investment. But, there is an offsetting efficiency loss whenever government intervenes in the market this way. For there to be a welfare gain, the benefits from rectifying the suboptimal provision of investments would have to offset the distortions created by the tax incentives themselves. Thus, while poorly operating capital markets have been identified as a market failure,[33] it has also been argued that a first best solution would be to implement the macroeconomic policies or structural reforms to remove impediments to investment.[34]

Empirical results of the literature studying the effect of tax variables on business investment are mixed, leading to the conclusion that these studies provide no clear policy guidance. Instead, Zee, Stotsky and Ley[35] and Buss[36] argue that tax incentives are unlikely to be abandoned by jurisdictions as policy tools and that ground rules should be adopted to minimize the economic distortions of the incentives.

These ground rules presume that tax incentives be treated as tax expenditures and bear the burden of proof. They are primarily based on the principles of cost-effectiveness and transparency. They include: 1) conducting cost-benefit studies prior to beginning new tax incentive programs or making awards to firms in targeted sectors, taking into account not just fiscal, but social costs and the cost of public opportunities foregone; 2) conducting periodic evaluations of all tax incentive programs; 3) requiring sunset provisions; 4) requiring transparency in all aspects--legal basis, economic consequences, and administrative procedures; and 5) utilizing simple, objective qualifying criteria to minimize discretionary application and to ease enforcement and monitoring.[37]

In its 2001-2003 report, The Tax Review Commission to the State of Hawaii noted: “A tax incentive program is a potential ‘black hole’, because it is a future benefit of unknown proportions, which is determined by the favored taxpayer’s interpretation of what the tax credit should be, and is claimed on a tax return which is confidential.” [38]

The Corporation for Enterprises Development (CFED) has observed: “While the public sector plays only one part in economic performance, state and local governments can influence the pace of economic development. Indeed, there is much they can do to increase competitiveness – ensuring good schools, investing in physical and human capital, making sure that economic benefits are shared widely across communities.

Despite these conclusions, state and local economic development efforts today focus almost exclusively on a single tool: tax incentives to influence the site selections and investments of private companies. Certain incentives, when properly structured with sufficient transparencies and safeguards, may provide some real benefit to communities. However, often they represent zero-sum strategies that divert public dollars to private companies without creating net new jobs and without demonstrating effective return on investment. State and local governments rely on incentives because the benefits are visible while the costs are hidden; they lead to good headlines ('State lures new manufacturing plant...'); and because other, more positive-sum strategies are long-term, difficult and don't easily translate into headlines, bumper stickers or re-election slogans."[39]

Most of the existing research involving tax incentive programs designed to attract venture capital is descriptive in nature. Typically, start-up and early-stage businesses must seek out equity capital from many sources. Dr. Daniel Sandler, Professor of Law at the University of Ontario, classifies the U.S. venture capital industry as "informal" and "formal".[40] Informal sources include "love capital" and "angel capital".[41] Formal sources include "venture capital".[42]

"Love capital" consists of equity provided to a business by either the owner or by the friends and family of the owner.[43] "Angel capital" consists of equity provided to a business by "accredited investors" unrelated to the owner.[44] Angel investors often take a "hands-on" approach towards nurturing the business.[45] "Venture capital" commonly refers to equity provided by venture capital funds.[46] These funds typically invest in a number of early-stage businesses.[47]

Venture capitalists provide a significant share of the total pool of risk capital for new business formations. Florida and Smith (1993)[48] note that venture capitalists are short-to-medium term investors holding their stake in the start-up company for 5-7 years, at which point the company is brought to market, merged, or sold off to another company. Venture capitalists have a range of business organizational forms. In the U.S., private limited partnerships, with general partners and limited partners, represent the largest share of the industry, followed by subsidiaries of large financial institutions.

In an analysis of venture capital formation and regional industrialization, Florida and Smith (supra) find that venture capital is characterized by 1) high degrees of capital mobility, 2) investment flows to areas of greatest opportunity and return, and 3) development of specialized sources of venture capital supply around established financial centers and centers of the high-technology industry. They also argue that geographic proximity reduces uncertainty, that investment pooling facilitates capital flow, and that capital mobility occurs through the network structure of the venture capital industry.

Many states have tax credit programs designed to attract equity capital. In examining state income tax credit programs, Dr. Sandler recommends that states impose certain requirements upon businesses receiving such credits. They include: "a description of

the business and the industry in which it operates; the amount of capital raised through the tax credit and all other capital that the business raised (i.e. did the program leverage other investment?); and the use of capital, in terms of the number of new employees, wage rates, capital expenditures, etc.)" [49]

In 2004, the Community Development Venture Capital Alliance ("CDVCA") published a report examining tax credit programs offered in 19 states.[50] This study categorized such programs as follows:

"Direct Tax Credit: Tax credit for an institutional or individual investor for an equity investment directly into a qualified business.

Seed capital credit: Tax credit for an institutional or individual investor for an investment in into a qualified investment fund making equity investments.

Contingent tax credit: Tax credit given to investors only in the event that a state-sponsored fund of funds is unable to fulfill the financial returns contractually defined by its investors." [51]

As of May, 2004, 19 states had in place some form of direct, seed capital and/or contingent tax credit program. The following table summarizes the CDVCA's findings on state tax credit programs: [52]

State	Direct	Seed Capital	Contingent
Arkansas	X		X
Colorado		X	
Hawaii	X		
Indiana	X		
Iowa		X	X
Kansas	X		
Kentucky		X	
Maine	X		
Michigan			X
Missouri	X	X	X
New York	X		
No.Carolina	X		
No. Dakota	X	X	
Ohio	X		X
Oklahoma	X		X
So. Carolina		X	X
Utah			X
West Virginia		X	
Wisconsin	X	X	
Total Programs	12	8	8

In its report, the CDVCA noted that most of the above 19 states are located in the Midwest or Mississippi Valley. Using 2003 data compiled by the Bureau of Economic Analysis, 14 out of 19 of the states had per capita GDP below the national median. [53] All but 3 of the 19 states had difficulty attracting private venture capital. The 3 exceptions --New York, Colorado, and North Carolina-- ranked 5th, 6th, and 10th in the nation in 2003 in attracting private venture capital. In addition, 8 of the 19 states offer more than one tax credit incentive program. Missouri offers all three programs.

The PriceWaterhouseCoopers MoneyTree report summarizes venture capital investments in the United States from 1995-2005 by private institutional venture capital firms.[54] In 2005, private institutional venture capitalists invested $21.7 billion in the United States. Two states, California and Massachusetts, accounted for more than 58% of this total. Taken together, eight states --California, Massachusetts, Texas, New York, New Jersey, Washington, Colorado, and North Carolina--accounted for more than 80% of the total invested. The average venture capital fund investment –or "deal size"—in 2005 was $7.4 million.[55]

Overview of Hawaii's Qualifying High Technology (QHTB) Investment Tax Credit

Act 221 (of 2001) provides eligible taxpayers a nonrefundable tax credit of up to $2,000,000 for an investment in a qualified high technology business (QHTB).[56] Act 221 applies to those taxpayers subject to Hawaii's income, franchise, and/or gross premiums tax.

Definition of QHTB

HRS Section 235-110.9(e) provides that a QHTB means "a business, employing or owning capital or property, or maintaining an office, in this State; provided that:

More than fifty percent of its total business activities are qualified research; and provided further that the business conducts more than seventy-five percent of its qualified research in this State ("the activity test"); or

More than seventy-five per cent of its gross income is derived from qualified research; and provided further that this income is received from: (A) Products sold from, manufactured in, or produced in this state; or (B) Services performed in this State (the "gross income test")." [57]

Measuring Activities under the Activity Test

For purposes of determining QHTB status, either the "activity test" or the "gross income test" must be satisfied. Business activities are measured by the cost of these activities, the time spent on these activities, or other consistently applied reasonable basis (based upon general principles in the income tax and general excise tax law).

What Constitutes "Qualified Research"?

"Qualified research" consists of one or more of the following activities:
1) research and development (as defined in IRC Section 41(d)); 2) development and design of computer software[58]; 3) biotechnology; 4) performing arts products; 5) sensor and optic technologies; 6) ocean sciences; 7) astronomy; or 8) non fossil fuel energy-related technology.

"Development and Design of Computer Software" Under Act 221 and Act 215

For an activity to constitute "development and design of computer software", Act 221 (of 2001) required the business to "develop and design computer software using fourth generation or higher software development tools or native programming languages to design and construct unique and specific code to create applications and design databases for sale or license".

However, Act 215 (of 2004) changed this definition. The term "development and design of computer software" now means the "development and design of computer software for ultimate commercial sale, lease, license or to be otherwise marketed, for economic consideration. With respect to the software's development and design, the business shall have substantial control and retain substantial rights to the resulting intellectual property." [59]

The Term "Qualified Research" is a Term of "Art"

It should be stressed that the term "qualified research" is defined by statute. As such, it is a term of "art", which at times, can be a bit of a "misnomer". To be a QHTB, a business must be engaged in a "qualified research" activity. A business conducts "qualified research" by conducting any one of the above-listed eight activities.

A business primarily engaged in research and development activity can be a qualified high technology business; so, too, can a business devoid of research and development activity. "Performing arts" businesses, such as film production, can qualify for the QHTB tax credit. Most other states that offer technology tax credits do not classify the act of making movies as a high technology activity.

Computation of QHTB Investment Tax Credit

The Act 221 credit is allowable for each year during a five-year period. It declines from 35% to 10% from the date of investment for investments made through year 5. The credit percentages are as follows:

Year 1…….35%
Year 2…….25%
Year 3…….20%
Year 4…….10%
Year 5…….10%

Example: In 2001, a Taxpayer forms a solely owned Qualified High Technology Business (QHTB) by investing $2,000,000. The projected non-refundable Act 221 credit is as follows:

Year 2001…….$700,000
Year 2002…….$500,000
Year 2003…….$400,000
Year 2004…….$200,000
Year 2005…….$200,000

Over a five-year period, the $2,000,000 investment in the QHTB in 2001 can generate a total of $2,000,000 in nonrefundable QHTB investment tax credits.

Example: Same facts as above, except that the taxpayer forms a solely owned QHTB by investing $2.5 million. Under these facts, the maximum total Act 221 nonrefundable credits the QHTB can generate to the taxpayer from 2001-2005 remains $2,000,000.

QHTB Tax Credit Amount is Based upon Amount Invested in QHTB

The term "Qualified High Technology Business Investment Tax Credit" is a bit of a misnomer in another respect. At the federal level, the "investment tax credit" that existed under prior law was based upon the cost of certain assets placed in service by a trade or business in a given year. However, the QHTB investment tax credit in Hawaii is based upon the amount of cash invested as equity in a QHTB.

Example: In 2001, a Taxpayer forms a solely-owned Qualified High Technology Business (QHTB) by investing $2,000,000. Each year, the QHTB spends $100,000 on assets and $50,000 on operating expenses.[60] The projected non-refundable Act 221 credit for each of the next five years is as follows:

Year 2001…….$700,000
Year 2002…….$500,000
Year 2003…….$400,000
Year 2004…….$200,000
Year 2005…….$200,000

Over five years, the $2,000,000 investment in the QHTB can generate $2,000,000 in nonrefundable QHTB investment tax credits. Although the QHTB paid out $750,000 for assets and expenses over this period, the QHTB credit is based upon the entire $2,000,000 equity investment.

Credit Recapture

An investment in a QHTB can generate an Act 221 credit over a 5-year period. However, under certain situations, a portion of the credit may be recaptured. These situations include: 1) the business no longer qualifies as a qualified high technology business; 2) the business –or an interest in the business—has been sold by the taxpayer investing in the qualified high technology business; 3) the taxpayer has withdrawn the taxpayer's investment wholly or partially from the qualified high technology business.

In each of the above situations, the credit recapture shall be equal to 10% of the amount of the total tax credit claimed in the preceding two years. The recaptured tax credit shall be added to the taxpayer's tax liability for the year in which the recapture occurs.

Example: In 2001, a Taxpayer forms a solely owned Qualified High Technology Business (QHTB) by investing $2,000,000. However, on 1/1/2003, the Taxpayer sells his entire interest in the QHTB. In 2003, the Taxpayer's state income tax liability will increase by an additional $120,000.[61] The Taxpayer cannot claim an Act 221 credit on his investment for 2003, 2004, or 2005.

Example: Same facts as in above example, except that the Taxpayer sells his entire interest in the QHTB on 1/1/2005. In 2005, the Taxpayer's state income tax liability will increase by an additional $60,000.[62] The Taxpayer cannot claim an Act 221 credit on his investment for 2005.

As noted earlier, in the year in which a QHTB ceases to qualify as a QHTB, a taxpayer may be faced with credit recapture. More significantly, the taxpayer may be faced with the loss of Act 221 credits in the year in which the QHTB ceases to qualify as a QHTB and in later years.

Example: In 2001, a Taxpayer forms a solely owned Qualified High Technology Business (QHTB) by investing $2,000,000. However, on 1/1/2002, the business ceases to qualify as a QHTB. In 2002, the Taxpayer's state income tax liability will increase by an additional $70,000.[63] Of more importance, the Taxpayer cannot claim an Act 221 credit on his investment for 2002, 2003, 2004, or 2005.[64]

Definition of "Investment"

In order to qualify for the Act 221 credit, "an 'investment' must be made in the QHTB. An investment will only be respected if the taxpayer has a reasonable expectation of (1) a return of capital and (2) a reasonable return on capital at the time the investment is made".[65]

Special Allocations

According to Tax Information Release No. 2003-01, Act 221 "allows partnership investors the flexibility of allocating the high technology business investment tax credit among the partners without regard to the substantial economic effect tax rule" of I.R.C. Section 704(b)(2). [66]

Example: Assume that Hawaii Taxpayers A and B form the AB Partnership in which Taxpayer A invests $2.5 million and Taxpayer B, $500,000. The partnership is a QHTB. Under the terms of the partnership agreement, over a five-year period, $2,000,000 in total Act 221 credits will be allocated to Taxpayer A and $1,000,000 to Taxpayer B. On an investment of $500,000, Taxpayer B is eligible for $ 1,000,000 in total Act 221 credits.

Example: Taxpayers A is a Hawaii Taxpayer. Taxpayer B is a Mainland Taxpayer. In 2001, Taxpayers A and B form the AB Partnership. The AB Partnership is a QHTB. Taxpayer A invests $500,000 and Taxpayer B, $1.5 million. The Partnership agreement contains a special allocation whereby Taxpayer A is allocated 100% of the Act 221 nonrefundable credit. In exchange for this special allocation, Taxpayer B receives an 80% profits and capital interest in the partnership. Under these facts, the maximum total Act 221 nonrefundable credits the QHTB will generate from 2001-2005 is $2,000,000 to Taxpayer A (the Hawaii investor) and $ 0 to Taxpayer B (the Mainland investor).[67]

Ray Kamikawa[68] has stated: "Act 221 was specially designed to attract capital from mainland, foreign, and tax-exempt persons that do not have Hawaii tax liability. This is through the mechanism of transferring unneeded tax credits from one investor to a Hawaii taxpayer investor by allocation of credits utilizing a special purpose pass thru entity. Indeed, in most of the transactions that I and other practitioners structure, they do involve mainland or foreign investors trading tax credits to Hawaii taxpayers for additional equity or profits interest in the QHTB. This marriage of Hawaii and non-Hawaii investors makes for new sources of capital, and helps spread the word outside of Hawaii about the good news of Act 221."

In a teleconference on October 12, 2006, Kurt Kawafuchi, Director of Taxation, State of Hawaii, indicated that, in reviewing comfort ruling requests, the amount of non-Hawaii capital flowing into Hawaii as a result of Act 221 is significant. Mr. Kawafuchi referred to the inflow of non-Hawaii capital into Hawaii as in the millions, maybe tens of millions, maybe hundreds of millions if you include movie deals.[69]

Abusive Transactions

T.I.R. No. 2003-01 also contains interim guidance including a discussion of certain common law doctrines that may be raised against so-called "abusive transactions". Specifically, the "economic substance", "business purpose" and "sham transaction" doctrine may be raised (in addition to any other doctrine that may apply).[70]

Economic Substance Doctrine

This doctrine denies tax benefits in transactions that do not result in a meaningful change to the taxpayer's economic position other than a purported reduction in tax. The Department of Taxation has stated that it will be reviewing transactions to determine if they have economic substance.[71] Under this doctrine, the taxpayer must establish that "(1) the transaction changes, or reasonably be expected to change, in a meaningful way (apart from State income tax consequences) the taxpayer's economic position, and (2) the taxpayer has a substantial non-tax purpose for entering into such transaction and the transaction is a reasonable means of accomplishing such purpose."[72]

Further, the transaction "must result in 'change in a meaningful way' in the taxpayer's economic position or have a 'substantial non-tax purpose'.[73] For example, it is intended that a 'reasonable possibility of profit', when interpreted to mean a minimal amount of profit, would not be sufficient to establish that the transaction has economic substance".[74]

Business Purpose Doctrine

The business purpose doctrine examines the taxpayer's intent. A taxpayer must have a substantial non-tax purpose for entering into a transaction that bears "a reasonable relationship to the taxpayer's normal business operations or investment activities".[75]

Special Rules for Movie and Television and Entertainment Projects

Tax Information Release No. 2003-01 contains numerous rules relating to investments in movie businesses. The Department of Taxation is developing and implementing an audit program to review investments into "single movie" QHTBs to determine whether they 1) satisfy the "activity test" or "gross income" test; and 2) are a "business" with the meaning of HRS Section 235-110(e).[76]

To satisfy the "activity test" the QHTB must actively produce the movie. To satisfy the "gross income" test, the QHTB must receive income from the sale of products of the QHTB.[77] For purposes of the "gross income" test, income will not include:

"Predetermined payments structured over the five year period that are not received from the sale of the products or services of the QHTB;

Payments from amounts that were set aside for the specific purpose of being distributed to the QHTB as 'income' in years two through five of the period during which the credit is claimed, for example, escrow accounts; and

Any other insubstantial amount received by the QHTB in years two through five of the period during which the credit is claimed where the Department determines the payment is made for the purpose of qualifying for the credit or not having a credit recaptured." [78]

Tax Information Release No. 2003-01 then gives detailed examples of the "income test" and/or "activity test" in the context of movie production. In addition, one of the examples illustrates what it means to be a "business" within the meaning of HRS Section 235-110(e).[79] Basically, the QHTB has to be actively involved in the production of the movie in Hawaii and the activities must be "sufficiently substantial and regular". This means that a business involved in a "one shot" movie deal –by making a film in Hawaii and then leaving Hawaii after the filming is completed-- is not a QHTB.

Act 215 (of 2004)

Act 215 (of 2004) extended the Act 221 credit for an additional five-year period (through year 2010). Act 215 (of 2004) became incorporated into the Hawaii Revised Statutes in Chapter 235, Section 110.9.

Selected provisions of Act 215 include: 1) allowing the Department of Taxation to assess and collect a fee for any comfort letter it issues; 2) changing the definition of "qualified research" with respect to the development and design of computer software; 3) requiring businesses to provide the Department of Taxation with certain information; 4) requiring the Department of Taxation to maintain certain taxpayer records, and to verify, total and certify certain taxpayer information; and 5) removing the "liberal construction" language found in prior legislation. Act 215 also codified certain common law doctrines, including economic substance and business purpose, as they relate to the investment, along with a presumption involving special allocations of the high technology business credit.

Fees for Comfort Rulings

Act 215 has established a new "Tax Administration Special Fund" and has authorized the Department of Taxation to charge fees for issuing high tech comfort rulings (comfort rulings); certifying credit amounts for the high technology business investment tax credit (investment credit) and the tax credit for research activities (research credit). The fees involved can be found in Department of Taxation Announcement No. 2005-19.

"Development and Design of Computer Software" Under Act 215

The 2004 legislation changed the definition of qualified research with respect to the development and design of computer software. The new definition is contained in the section of this report entitled " 'Development and Design of Computer Software' Under Act 221 and Act 215".

Information Reporting Requirements – Prior to Act 215

In the State of Hawaii, the confidentiality requirements of Act 221 –and of other Acts-- restrict access to certain individual taxpayer information. Specifically, identifying information relating to the names of individual firms and investors claiming the credit, the amount invested, the number and types of jobs created, and the amount of credit claimed are not available to the general public.

In conjunction with the publication of Tax Information Release No. 2003-1, the Department of Taxation revised existing tax forms and developed new tax forms for the QHTB tax credit for tax year 2002. [80] The Department of Taxation revised Form N-318,[81] and developed Form N-317 [82] and Form N-318A[83]. In addition, the

Department of Taxation announced the implementation of an audit program involving the QHTB tax credit.

Information Reporting Requirements Under Act 215

In extending the QHTB tax credit for an additional five years, Act 215 requires investors claiming the credit to disclose more information to the Department of Taxation. Each taxpayer shall submit a written, certified statement to the Director of Taxation identifying 1) qualifying investments and 2) the amount of QHTB tax credits claimed. This information, contained on Form N-318A, is generally not available to the public.

Example: In Year 1, Taxpayer invests $500,000 in a QHTB. For Year 1, she is eligible to claim a nonrefundable tax credit of $175,000 (35% x $500,000). Before March 31, Year 2, she is required submit a written certified statement to the Director of Taxation.

Department of Taxation QHTB Investment Tax Credit Information Maintenance Requirements

Under Act 215, the Department of Taxation shall: "1) maintain records of the names and addresses of the taxpayers claiming the credits under this section and the total amount of the qualified investment costs upon which the tax credit is based; 2) verify the nature and amounts of the qualifying investments; 3) total all qualifying and cumulative investments that the Department certifies; and 4) certify the amount of the tax credit for each taxable year and the cumulative amount of the tax credit."[84]

Presumption Relating to Doctrines of Economic Substance and Business Purpose

Act 215 codifies the economic substance and business purpose doctrines as they relate to investments in a QHTB. A presumption exists that these doctrines are satisfied to the extent that the special allocation of the QHTB tax credit has an investment tax credit ratio of 1.5 or less of credit for every dollar invested. Where this ratio is greater than 1.5, but no more than 2.0, such transactions may be reviewed by the Department of Taxation for purposes of applying these doctrines. Where this ratio is greater than 2.0, the affected business must substantiate economic merit and business purpose.

While the Department of Taxation reviews information for purposes of issuing comfort rulings, the Department of Taxation has indicated that it does not know how many QHTBs exist "in the universe of QHTBs".[85] The reason is that a business does not have to obtain a comfort ruling in order to be a QHTB. While the credit multiple for QHTBs that do not seek a comfort ruling can be determined upon audit, for certain years, the audit rate is less than 2%, and for some years, less than 1%. (See "Audit Rate" section of this Final Report).

Removal of "Liberal Construction" Language

Act 215 removed the so-called "liberal construction" language contained in Act 221. According to Ted Liu, Director of the Hawaii State Department of Business, Economic Development and Tourism, "Liberal construction has not achieved its purpose, rather it's done the opposite by overloading the Department of Taxation in reviewing proposals they shouldn't be".[86] Rather than being liberally construed, the provisions of Act 215 are to be construed in a manner consistent with its intent.

Measuring the Costs and Benefits of Hawaii's QHTB Investment Tax Credit[87]

At the outset, it should be noted that analyzing the tax policy implications of a given tax incentive is a process about which reasonable minds can differ. In the area of state tax policy, much remains unknown or unknowable. In part, this is due to a lack of access to usable taxpayer data.

In analyzing the effect of Act 221 upon high technology investment in Hawaii, the logical place to start would be an analysis of individual Qualified High Technology Business (QHTB) investments and corresponding expenditures, jobs and other metrics of performance.

For purposes of our analysis, the Hawaii Department of Taxation has given us access to certain data consistent with maintaining the confidentiality of individual taxpayer's information. In some cases, the Department of Taxation has aggregated certain taxpayer data. In others, the Department of Taxation has declined our requests in order to preserve the confidentiality of taxpayer information.

The Department of Taxation would not provide the authors with any individual firm data (including individual firm data redacted to protect taxpayer confidentiality). In at least one case, the Department of Taxation was not able to provide the authors with certain aggregate information.[88]

In the absence of firm-level data, the authors' study examined a range of indicators that could yield useful information about the performance of the high technology tax credit program. At the macroeconomic level, measures that compare Hawaii's performance with that of the U.S. as a whole could be useful. These include the relative performance of such measures as the amount of private institutional venture capital raised and the net number of high technology jobs created. Thus, this Final Report presents information derived from publicly available data sources and data made available to the authors by the Department of Taxation.

Comparison of Act 221 to Credits Offered by Other States

Hawaii's QHTB investment tax credit is, by far, more generous than the technology tax credits offered by other states. Simply put, no other state offers an investor a 100% credit based upon up to $2,000,000 contributed as an investment to a qualified high technology business.[89]

In fact, Hawaii's QHTB Investment Tax Credit shares more features in common with so-called "angel", "seed capital", and "venture capital" tax incentives programs than with the technology tax credit programs by those states offering technology tax credit programs.

In analyzing such tax credit incentives for private direct investment, the National Association of Seed and Venture Funds (NASVF) noted:

"The Wisconsin Angel Investment Tax Credit Program has a particularly good method for attracting, vetting, and selecting applicants. A typical credit is 20% of the amount invested."[90]

In analyzing Hawaii's tax credit incentives for private direct investment, the National Association of Seed and Venture Funds (NASVF) stated:

"Hawaii has the most generous credit—100% of the amount invested over five years. This program has drawn criticism from some in the state as being so overly generous as to 'tilt' the playing field". [91]

With respect to the private institutional venture capital industry, we have access to publicly available data.[92] In our first table, we compared Hawaii's share of private institutional venture capital firms' total U.S. investment for the period 1994-2005. Hawaii ranked 38th.[93] Hawaii companies received less than 1/10th of 1% of the total.[94]

The Act 221 credit became law in 2001. From 2001-2005, private institutional venture capital firms invested the following amounts in Hawaii:

2001…….$ 37.8 Million
2002…….$ 2.9 Million
2003…….$ 16.6 Million
2004…….$ 25.6 Million
2005…….$ 15.3 Million

For the period 2001-2005, Hawaii also ranked 38th. However, on a percentage basis, Hawaii's relative share of the total actually decreased during this period. [95]

As mentioned earlier, in 2004, 19 states offered some form of tax credit incentive program. [96] Using data from 2001-2005, we computed both the amount of venture capital raised in each of these 19 states and each state's venture capital ranking. The

top 7 states received more than 90% of the total venture capital funding received by these 19 states from 2001-2005. Hawaii ranked 13th out of 19 states. On a percentage basis, Hawaii's relative share of the total was approximately 6/10th of 1%.

In light of the above, on a *relative* basis, for the period 2001-2005, Act 221 and 215 have not led to increased institutional private venture capital investment in Hawaii.

In an article in the Honolulu Advertiser, Barry Weinman, Managing Director and Co-Founder of Allegis Capital,[97] made this observation:

"Act 221…discourages the formation of a large pool of capital here. Why? Because most of the venture capital money in the United States –about 50 percent-- comes from pension funds." [98] Pension funds, endowments, and trusts are willing "to support the better companies, not on their tax deals but on the quality of their companies." [99]

Proponents of the Act 221 tax credits argue that capital formation is encouraged by increasing the pool of investment funds from smaller, more risk-averse investors, who can participate in the non-institutional private venture capital market by becoming equity owners in such funds, albeit with small shares.[100]

In response to the authors' presentation before the Tax Review Commission on October 6, 2006, several members of the high technology industry have publicly criticized the authors' use of publicly available private institutional venture capital data. In addition, several members of the industry have requested that the authors of this Final Report primarily focus upon taxpayer data.

Publicly available data indicate that $2.9 million of private institutional venture capital investment took place in Hawaii in 2002. Department of Taxation data reported that $81.8 million of Act 221/215 investments took place in 2002. Members of the high technology industry draw the inference that the authors' findings with respect to Hawaii's share of private institutional venture capital must somehow be "flawed" because these findings are inconsistent with the Department of Taxation data.

The authors of this Final Report respectfully disagree with such members of Hawaii's high technology industry. It should be noted that the $2.9 million represents *private institutional venture capital*. While this figure represents about half of the venture capital raised in the United States –from pension funds, endowments and the like— it does not include so-called "*seed capital*" or "*angel investment*".

At some point in time, a growing and vibrant technology sector should attract growing and significant amounts of *private institutional venture capita*l. At this time, Hawaii is not there.

Tracking Current Program Costs (and Projecting Future Costs)

The following table tracks the total Act221/Act 215 credits claimed (used to offset taxes): [101]

Tax Year	Credits Claimed-- All Taxes (in millions)
2000	$ .4 [102]
2001	$ 9.6
2002	$ 26.2
2003	$ 38.9
2004	Not Yet Available
2005	Not Yet Available
Total[103]	$ 75.0

Credits Claimed, Future Claimable Credits, and Credit Carryovers

The Act Section 221 credit is based upon the amount invested. A $2,000,000 investment in a QHTB by a taxpayer in 2001 can generate claimable credits totaling $2,000,000 over the next five years. Thus, some of the credits claimed in 2002 relate to amounts invested both in 2001 and 2002. The distinction between "credits claimed" and "future claimable credits" can be illustrated by as follows:

Example: From 2001-2005, a single QHTB is set up each year. Taxpayer A forms a solely owned QHTB by investing $2,000,000 in 2001. Taxpayers B-E form solely owned QHTBs in years 2002-2005, respectively. Assume further that each taxpayer can fully utilize whatever credit is generated in a given year.

The following table presents the hypothetical amount of credit claimed for each year from 2001-2005 (in thousands).

	2001	2002	2003	2004	2005
A	$700				
AB	$500	$700			
ABC	$400	$500	$700		
ABCD	$200	$400	$500	$700	
ABCDE	$200	$200	$400	$500	$700

Adding across, the total credit claimed for each year will be as follows:

Year	Total Credit Claimed (in 000's)
2001	$ 700
2002	$1,200
2003	$1,600
2004	$1,800
2005	$2,000
Total (01-05)	$7,300

In our hypothetical example, a level amount of investment during 2001-2005 results in an increasing amount of "credit claimed" each year. This is due to the credit being claimed over a 5-year period.

In addition, in our hypothetical example, for years after 2005, significant "future claimable credits" exist. These can be shown as follows:

Taxpayer	Future Claimable Credits (For Years After 2005)
A	$ 0
B	$ 200
C	$ 400
D	$ 800
E	$ 1,300
Total	$ 2,700

Thus, the structure of Act 221 creates future claimable credits.

The Effect of Credit Carryovers

In the above example, we assumed that each taxpayer had enough tax liability in a given year to fully utilize the taxpayer's share of the Act 221 credit. However, in the event the credit exceeds the taxpayer's tax liability for a given year, a credit carryover is created.

Example: In 2001, Taxpayer A invests $2,000,000 in a solely owned QHTB. In year 2001, The Act 221 credit is $700,000 (35% x $2,000,000). However, Taxpayer A's tax liability before the credit in 2001 is such that only $150,000 of the $700,000 credit can be utilized in 2001. The remaining $550,000 will be "carried over" to offset tax liability in future years.

To What Extent Do Future Claimable Credits -- and Carryovers of Current Unused Credits-- Represent Future Tax Expenditures to the State of Hawaii?

Act 221 will likely result in significant future tax expenditures by the State of Hawaii. Table 1 contains data for tax year 2001-2002 and preliminary data for tax year 2003. This table indicates that total cumulative credits claimed during this period exceeded $75 million. The Department of Taxation estimates that total cumulative credits available, including those claimed, as of the end of 2003 is approximately $185.1 million.[104]

The preliminary data for 2003 also indicate that credit carryovers have increased significantly. The credits carried forward amount is $25.2 million. This amount is presumably part of the $185.1 million total cumulative credit amount mentioned above. It should be noted that, in 2003, both individuals and insurers generated significant credit carryovers.

In light of the above, the ultimate cost of the program is difficult to determine without having access to more data from the Department of Taxation. Table 1 estimates the current and future cost of the Act 221 program from 2001-2003 to be about $185.1 million. However, the total current and future cost of the Act 221 program from 2004-2005 is not currently available to the public. In 2004, Act 215 extended the credit program for another 5 years, thereby increasing total potential future credit program costs.

Utilization of QHTB Credit to Offset State of Hawaii Individual Income Tax/Corporate Income Tax/Bank Tax/Hawaii Insurance Premium Tax

As mentioned earlier, the high technology investment tax credit available under Act 221 can be used to offset a variety of taxes. The following table, based upon data provided to us by the Department of Taxation, examines the percentage of the total QHTB investment tax credit claimed by category of taxpayer claiming the credit.

	2000	2001	2002	2003*	2004--2005
Individual Income	97%	35%	43%	34%	Not yet available
Insurance Premium	0%	63%	50%	50%	Not yet available
Corporate Income	0%	2%	7%	10%	Not yet available
Financial Institution	3%	0%	0%	5%	Not yet available
Fiduciary	0%	0%	1%	0%	Not yet available
Total QHTB Credit Claimed (%)	100%	100%	100%	100%	Not yet available

* preliminary

Act 221 was enacted into law in 2001. This data suggests that the insurance industry is a major beneficiary of this credit. Given that the Act 221 credit is claimed over a five-year period, a reasonable inference can be drawn that this will continue to be the case.

The Department of Taxation's website contains selected information relating to 2002.[105] In that year, insurance underwriters claimed $13.518 million in tax credits. Of this amount, the Act 221 credit comprised $13.058 million. Stated alternatively, the Act 221 credit comprised over 96 percent of the total reported credits that insurance underwriters claimed in 2002.[106]

Individuals are also major beneficiaries of the Act 221 credit. Some individuals invest directly, while others invest indirectly through the use of flow-through entities. In 2002, individuals claimed $11.2 million in Act 221 credits. This credit comprised about 14.9 percent of the total credits that individuals claimed in 2002.[107]

Of the $11.2 million in Act 221 credits claimed by individuals in that year, taxpayers living in the 1st Taxation District of Hawaii claimed $9.5 million (approximately 85 percent , proportionally more than the district's share of state population)[108] and taxpayers living in the 2nd Taxation District of Hawaii, $1.5 million (approximately 13.8 percent).[109] Taxpayers in these two districts benefit relatively more than taxpayers in the remaining two tax districts.

Cost-Benefit Analysis of Hawaii's Qualifying High Technology Business Tax Credit

Basis for Program Assessment

Act 221 (SLH 2001) encourages the continued growth and development of high technology businesses in Hawaii. Act 215 (SLH 2004) adds that "A need exists to increase the availability of venture equity capital for emerging, expanding, relocating, and restructuring enterprises in the State." Neither Act, however, makes a reference to measures of program evaluation, other than the statements noted here.

What is the desired change in economic behavior? In the case of Hawaii's QHTB tax credit program, some have argued it is an increase in the supply of capital to inherently

high-risk high technology ventures in Hawaii. Others have argued that outcome measures should focus on jobs and salaries. An analysis of both is needed.

Table 1 provides estimates of QHTB investments and tax credit claims for Tax Years 2000 through 2003. They are based on data derived from the Form N-318s filed by individual, corporate, insurance company, financial institution and fiduciary investors in QHTBs for the respective tax years. As noted earlier, the data show that insurance companies are major taxpayer beneficiaries of the QHTB tax credit to date. The data also show that annual amounts of QHTB investments have leveled off and appear to be declining.

Program Audit Assessment of Effectiveness

The most direct assessment of the QHTB tax credit program effectiveness requires access to data at the micro level. Given measurable program outcomes, an audit of individual QHTB performance covering a specified period of time could be aggregated to develop an assessment of the QHTB tax credit program. QHTB data annually reported on the Department of Taxation's Form N-317 would reveal the amount of investment received, the number of jobs created and salaries paid by each QHTB. At the same time, investment funds flowing to the QHTB in each year can be independently derived from the Department of Taxation's Form N-318 and N-318A. Gross revenues for each QHTB can be determined from General Excise Tax/ Use Tax filings.

As has been noted earlier, however, the Department of Taxation has declined access to individual QHTB data, in deference to taxpayer confidentiality. This precludes those outside the Department from this audit avenue of analysis.

Cost Effectiveness Ratio and Elasticity Assessment of Effectiveness Approaches are Generally not Identified with Sufficient Data

In the absence of a direct audit, one approach to assess the effectiveness of tax credit incentives is the use of simple cost effectiveness ratios.[110] These ratios are derived as the change in desired economic behavior, divided by the amount of tax credits awarded during the period. For the review purposes here, this approach suffers from several deficiencies: 1) reliable data on total investment in Hawaii-based high technology firms is not publicly available, 2) macroeconomic effects of induced investment substitution to Hawaii-based high technology firms from other Hawaii firms are not taken into account, 3) the time-value of QHTB tax credits received is not taken into account.

Another approach utilizes elasticity measures to quantify the responsiveness of technology investment with respect to the user cost of capital. Elasticity is the percentage change response in the target variable, divided by the percentage change response in the policy variable. Review studies of the elasticity of investment to user

cost of capital effects of tax incentives in the U.S. indicate elasticities in the range between -0.5 and -1.0; they are reported to be unitary for U.S. R&D tax credits.[111] Elasticities of this size have been deemed to have significant impact on the measured outcomes. As in the case above, this second approach requires reliable data on total investment in Hawaii-based high technology firms.

Table 2 shows the profile of QHTBs who filed Form N-317s for 2002 and 2003, the only two years for which this aggregate data is available from the Department of Taxation. Only a few generalizations can be made about the profile of QHTBS. Performing arts products QHTBs have a consistently large share of jobs; computer software product QHTBs and performing arts QHTBS represent one third and one sixth of the QHTBs, respectively.

These aggregate data are used to determine point elasticity responses to changes in QHTB investment generated by the existence of the QHTB tax credit program. The QHTB tax credit elasticity of QHTB spending, for example, may be measured by the percentage change in QHTB spending, divided by the percentage change in QHTB investments received. While not typically used to assess effectiveness, these elasticities can be illustrative.

The point elasticities are all less than one and suggest weak responsiveness of these economic measures among QHTBs (Table 3). In terms of additional QHTB spending, measured by "Costs Incurred," the relative stimulation effect of the QHTB tax credit program appears to be small. In terms of the additional salaries paid to QHTB employees, the relative stimulation effect of the QHTB tax credit program is larger. This likely reflects the heavier investment in human capital in high-technology companies and the accrual of economic rents by labor in a tight labor market.

The usefulness of these calculated point elasticities is limited, however. It is not clear that the data provided by the Department of Taxation captures the activity of all QHTBs. The number of QHTBs reporting in 2003 (n=77) is substantially lower than the number reporting in 2002 (n=131). Without review of individual firm filings, it cannot be determined whether a significant number of QHTBs reporting in 2002 ceased operation as QHTBs in 2003, whether a number of the QHTBs who reported in 2002 simply did not report in 2003, or whether another reason explains the reduction in filings.

Cost-Benefit Assessment of Effectiveness

Another approach to assess the cost effectiveness of QHTB tax credits is to treat the statutory provision as if it represents an ongoing program or project. Hereafter the terms "program" and "project" are used interchangeably. Programs are typically assessed utilizing cost-benefit analysis on identifiable cost and benefit streams over time. The present value of the cost stream, C, is equal to the sum of the costs from each future period, discounted to its present value. Similarly the present value of the benefit stream, B, is equal to the sum of the benefits from each future period,

discounted to its present value. The benefit-cost ratio, B/C, and the benefit-cost differential, B – C, provide policy guidance in the selection of projects. They are measures indicating whether the project should be conducted at all, that is when B/C > 1 or B – C > 0, or whether one project may be preferred to another.

What is the appropriate rate of discount in cost benefit analysis? For private projects, the appropriate discount rate is represented by the private opportunity cost of funds, or the cost of capital for firms. For public projects, the appropriate discount rate is lower than the private cost of capital.

Funds for public sector projects usually reduce both private sector investment and consumption. The appropriate discount rate reflects both opportunity costs of private investment and private consumption foregone. If financing of public projects come entirely at the expense of investment, then the public project cost of capital would be the opportunity cost of private investment foregone, or the private cost of capital. If financing of public projects come entirely at the expense of consumption, then the public project cost of capital would be the opportunity cost of consumption foregone, measured by the household rate of return from saving. In an income tax regime, the household's return from saving, otherwise the same as the private cost of capital, is reduced by the household's income tax rate.

Alternatively, it may be observed that private project cost of capital is the market return on investment, whereas, public project cost of capital, as in the case of debt financing, is generally tax exempt but at rates lower than the market return on investment.

In 2003 QHTBs reported $51.6 million in gross revenues (Table 4). Most of the QHTBs that filed the General Excise (GE)/Use tax returns remitted GE/Use tax payments ranging up to $50,000. Five QHTBs were reported to have no revenue. Another thirty three QHTBs were reported to have no information, suggesting that they did not file GE/Use tax returns for the year.

Revenues are classified by qualified research activity, some aggregated to preserve taxpayer confidentiality. Computer software design and performing arts product activities are separately identified. IRC section 41(d), biotechnology, sensor and optic technologies, ocean sciences, ocean science, astronomy, and non-fossil fuel energy related technology activities are combined to form an aggregate research and development activity. The activity labeled 'Multiple' corresponds to those QHTBs who reported participation in more than one of the statutory activities. This data predates Act 215 and represents computer software design and development as defined by Act 221.

Benefit-Cost Ratio Methodology

A benefit-cost ratio analysis, utilizing multipliers from the 2002 State Input/Output Study for Hawaii, is performed under two operating scenarios. The first assumes that

activities of other public programs are foregone in the amount of the tax credits. It compares the cost of public sector activities foregone, to the benefits of the increased private sector activities in high technology. The second assumes that activities of public programs are maintained at pre-tax credit levels but that other taxes (income tax, for example) need to be raised in order to support the tax credit expenditures. It compares the cost of consumption activities foregone, to the benefits of the increased private sector activities in high technology, and assumes that the increase in taxes comes entirely at the expense of consumption. If some of the increase in taxes comes at the expense of saving and investment flows, then the multiplied cost effects of the tax credit program would be higher. Both approaches assume that that an increase in sales by the various high technology sectors corresponds to an increase in final demand.

Because QHTB investment and tax credit data is publicly available only for Tax Years 2000, 2001, 2002, and 2003, the benefit-cost ratio analysis will only examine the relative costs and benefits for investments made in these years. Investments made during these years identify a credits claimed cost stream. This stream is developed from actual credits claimed, the tax credit aging schedule developed from these investments, and historical amounts of tax credit carryover. Investments made in any of the tax years generate credits claimed over a five year period, and longer with credit carryover. At a minimum, the cost stream of credits claimed in this study covers the period from Tax Year 2000 through Tax Year 2007. Under the first scenario, the cost of the QHTB tax program represented by this tax credit stream is the multiplied effect of government activity foregone, measured in output, earnings and jobs. Under the second scenario, the cost of the QHTB tax credit program is the multiplied effect of personal consumption foregone.

Only for the purpose of the benefit-cost ratio analysis, Tax Year 2003 is chosen as the base year. This is because QHTB gross income or sales data is available only for this year from the Department of Taxation. For all other purposes, the relevant year of comparison is 2001, the year in which Act 221 was promulgated.

QHTB gross revenue data from the Department of Taxation for tax year 2003 identify the sales of QHTBs who reported, by qualified research activity. This study categorizes the qualified research activities to align, as best possible, with NAICS type industry sectors. The assignment process facilitates use of DBEDT's multiplier values that are defined in terms of NAICS type industry sectors. Computer software design sales, performing arts sales, and an aggregated R&D sector, composed of IRC section 41(d), biotechnology, sensor and optic technologies, ocean sciences, ocean science, astronomy, and non-fossil fuel energy related technology sales, represent three of the NAICS type industry sectors. Revenues reported under a Multiple category are allocated to the three prior sectors (publishing, motion picture, and R&D) by business unit count share.

The analysis assumes that the 2003 level of QHTB sales activity remains constant in real terms. This identifies the future benefit stream, or the multiplied effect of future

QHTB sales, measured in output, earnings and jobs. No further investment in QHTBs established as of 2003 is assumed to occur. The absence of QHTB firm data precludes estimates of sales activity growth financed by retained earnings or other sources of investment funds.

Whether the QHTB investment tax credit affects incremental investment and firm sales above what would have occurred without the credit is an unanswered question. The kinds of activities and sales that would have occurred without the credit include: sales that a firm would have produced without the credit, sales by QHTBs that are "drop down" subsidiaries of an existing firm, and sales by QHTBs that replace or displace sales by non-QHTB technology firms.

"Displacement" Defined

The reported 2003 Hawaii QHTB sales likely include effects of the phenomenon described above. The term "displacement" is used here to describe the amount of activities and sales that would have occurred without the credit and are over-counted by measured QHTB investment tax credit activities. Sensitivity analysis for various levels of displacement, 10 percent, 20 percent, and 40 percent, are examined. Two discount rates are utilized: a ten percent rate represents pre-tax long term return on U.S. equities; a seven percent discount rate represents after tax return.

Benefit-Cost Ratio Results[112]

Benefit-cost ratios in each year from 2003 through 2007 are illustrated in Tables 5 and 6. Alternative metrics, including output, earnings, jobs and taxes generated, are utilized and the effects of alternative rates of displacement are simulated.

Ratios for the operating scenario in which government activity is foregone as a result of the QHTB tax credits are more often close to or less than one, especially when displacement of existing non-QHTB high technology activities is considered. This suggests that the economic benefits are less than the costs. Benefit-cost ratios for the operating scenario in which personal consumption is foregone as a result of the QHTB tax credits indicate better performance outcomes for the QHTB credits.

It is helpful to note that reported benefit-cost ratios for the tax effects represent the ratio of state taxes generated by the activities of the QHTBs to state taxes that would have been generated by public sector activities foregone in one instance, and by the private consumption activities foregone in the other instance. A ratio of 1.0, for example, means that the amount of state taxes generated by high technology businesses financed by the QHTB tax credit is the same as the amount of state taxes generated by the state spending on its public programs in the amount of the tax credit.

To see what the tax return would be on tax credits claimed, a different ratio needs to be examined. Estimated state tax revenues as a percent of QHTB tax credits claimed

are reported in Table 7. The data represent a tax return on a tax credit "investment" and range from 4 percent to 11 percent.

Taken together, these results cannot conclusively determine whether or not the QHTB tax credits have been cost effective. However, when additional efficiency costs of distortion and rent seeking behavior and additional administrative costs are considered, but not measured here, the results are likely to be more negative than positive.

Limitations to Benefit-Cost Ratio Analysis

Limitations to this approach should be noted. Some considerations would suggest that the benefits of the QHTB investment tax credit are undercounted. For example, firms in the targeted industry sectors will not produce revenue in the early years of the pre-revenue, pre-profit and profit stages of the venture capital life cycle. In other words, an analysis based on data ending in 2003 may be premature.

An opinion piece by Mike Fitzgerald[113] cites as additional benefits the development of venture capital markets and financial flows to Hawaii from out-of-state. However, these benefits would eventually be captured in the downstream performance of the QHTBs.

Other considerations are more neutral. The benefit-cost ratio approach, based on multipliers derived from an input/output model, is static rather than dynamic. It does not provide for substitution effects and does not capture shifts in the environment of high technology firms that can affect their productivity and input mix. It is difficult to predict what a more dynamic model for high technology in Hawaii would demonstrate without constructing such a model.

The particular analysis performed here focuses only on the high technology sectors that benefit from the QHTB investment tax credit. To be comprehensive, the potential negative effects on other types of investment need to be considered. If the targeted sector is the not the optimal one, then the outcome could be a reduction in net investment in the state, as more investment is discouraged by the revenue-replacing tax increase than is encouraged by the tax incentive.

Other considerations would suggest that the costs of the QHTB investment tax credit are not sufficiently represented. The benefits and costs measured here do not measure the efficiency loss of market failure or the net efficiency gains, if any, from the tax incentive policy solution. For a nominal 100 percent tax credit, resource waste arising from tax policy intervention in the capital market may not be warranted by the market failures therein.

Finally, the benefit-cost ratio approach does not measure equity effects of the QHTB investment tax credit on the distribution of benefits, relative to the distribution of the costs. It may well be that the beneficiaries of the tax credit are not the same as those who bear the burden of the tax credit's cost.

Table 1 Investment in Qualified High Technology Businesses (QHTBs) and Tax Credits Claimed

	Investments in QHTB ($million)	Credits Claimed ($million)	Credits Carried Forward ($million)	Future Claimable Credits ($million)
2000	3.94	0.39	0.0	
2001	30.79	9.58	2.2	
2002	81.87	26.19	13.1	
2003*	68.49	38.87	25.3	
2004	not yet available	not yet available	not yet available	
2005	not yet available	not yet available	not yet available	
Total	185.08**	75.03**		110.05**

* Preliminary data

** Total only through Tax Year 2003

Source: Department of Taxation

Table 2 Qualified High Technology Business (QHTB) By Activity - Form N-317
Tax Year 2002 and Tax Year 2003

Tax Year 2002

	QHTBs	Jobs	Salaries Paid		Costs Incurred	Investments Received
Activity	Share	Share	Share	Average	Share	Share
Computer Software	32.1%	40.6%	62.1%	$47,997	67.7%	60.7%
Performing Arts	15.3%	37.6%	8.5%	$7,132	13.9%	19.6%
Biotechnology & Ocean Science	3.8%	2.5%	3.8%	$47,742	2.4%	2.8%
Sensor and Optic & Nonfossil Fuel Energy	5.3%	15.9%	22.6%	$44,475	13.3%	10.7%
Astronomy		0.5%	0.4%	$25,209	0.7%	1.3%
IRC section 41D	43.5%	2.9%	2.7%	$29,199	2.0%	4.9%
TOTAL	131	2209	$69,381,937	$31,409	$144,843,921	$118,237,560

Tax Year 2003

	QHTBs	Jobs	Salaries Paid		Costs Incurred	Investments Received
Activity	Share	Share	Share	Average	Share	Share
Computer Software	29.9%	11.1%	15.1%	$29,760	10.6%	12.0%
Performing Arts	13.0%	39.3%	4.2%	$2,329	6.2%	7.3%
Multiple Activity	44.2%	45.3%	76.4%	$36,916	76.6%	75.7%
Others *	13.0%	4.3%	4.3%	$21,912	6.6%	5.0%
TOTAL	77	1980	$43,300,583	$21,869	$118,342,458	$68,529,705

Source: Department of Taxation
Includes IRC Section 41(d), Ocean Sciences and Non Fossil Fuel Technology.
Data suppressed to protect taxpayer confidentiality.

Table 3 Responsiveness to Changes in Investments in QHTBs

2003 over 2002

	Point Elasticity
Change in QHTB Total Jobs	N/A[114]
Change in QHTB Spending	0.38
Change in QHTB Salaries Paid	0.87

Table 4 Gross Income and GE/USE Tax Returns of Qualified High Technology Businesses 2003

Activity	Gross Income	General Excise/Use Tax Returns*					
	($)	$0	$0 to $50,000	$50,000 to $100,000	$100,000 and over	No Info	Total
Computer Software	$16,944,160	4	17		1	15	37
Performing Arts	1,091,940		5			6	11
Multiple	28,048,135	1	3		1	5	10
Others**	5,541,523	0	12	1	0	7	20
Total	$51,625,758	5	37	1	2	33	78

* After exemptions

** Includes IRC Section 41(d), Ocean, Nonfossil fuel energy, Sensor & Optics, Astronomy.

Data suppressed to protect taxpayer anonymity.

Department of Taxation special tabulation of gross income, gross income/use taxes paid, 2003

Table 5 Benefit-Cost Ratios Calculated for QHTB Tax Credit Program
2000 – 2003 Investments in QHTBs
Scenario: Tax Credits Reduce Other Government Spending

		No Displacement Existing High Tech Sales		10% Displacement		20% Displacement		40% Displacement	
		Discount Rate		Discount Rate		Discount Rate		Discount Rate	
		10%	7%	10%	7%	10%	7%	10%	7%
Final Demand	2003	1.03	1.05	0.93	0.94	0.82	0.84	0.62	0.63
Output Effect	2004	1.09	1.10	0.98	0.99	0.87	0.88	0.65	0.66
	2005	1.11	1.13	1.00	1.01	0.89	0.90	0.67	0.68
	2006	1.20	1.22	1.08	1.10	0.96	0.97	0.72	0.73
	2007	1.36	1.39	1.22	1.25	1.08	1.11	0.81	0.83
Final Demand	2003	0.79	0.81	0.71	0.73	0.63	0.65	0.48	0.48
Earnings Effect	2004	0.84	0.85	0.75	0.76	0.67	0.68	0.50	0.51
	2005	0.86	0.87	0.77	0.78	0.69	0.69	0.51	0.52
	2006	0.92	0.94	0.83	0.84	0.74	0.75	0.55	0.56
	2007	1.04	1.07	0.94	0.96	0.84	0.85	0.63	0.64
Final Demand	2003	1.22	1.24	1.05	1.07	0.89	0.91	0.60	0.62
State Tax Effect /1	2004	1.28	1.30	1.12	1.14	0.97	0.98	0.68	0.69
	2005	1.31	1.33	1.16	1.17	1.01	1.02	0.72	0.73
	2006	1.42	1.44	1.25	1.27	1.09	1.11	0.79	0.80
	2007	1.60	1.64	1.42	1.45	1.24	1.27	0.90	0.93
Final Demand Jobs Effect /2	2003	0.79		0.71		0.63		0.47	

1/ Tax costs represent only taxes foregone from reduced public sector expenditure;
Tax expenditures not included in cumulative cost
2/ Job count not subject to discount rate

Table 6 Benefit-Cost Ratios Calculated for QHTB Tax Credit Program
2000 – 2003 Investments in QHTBs
Scenario: Tax Credits Offset by Increased Personal Income Tax

		No Displacement Existing High Tech Sales		10% Displacement		20% Displacement		40% Displacement	
		Discount Rate		Discount Rate		Discount Rate		Discount Rate	
		10%	7%	10%	7%	10%	7%	10%	7%
Final Demand	2003	1.35	1.38	1.22	1.24	1.08	1.10	0.81	0.83
Output Effect	2004	1.43	1.45	1.29	1.30	1.14	1.16	0.86	0.87
	2005	1.46	1.48	1.32	1.33	1.17	1.18	0.88	0.89
	2006	1.58	1.60	1.42	1.44	1.26	1.28	0.95	0.96
	2007	1.78	1.82	1.60	1.64	1.43	1.46	1.07	1.09
Final Demand	2003	1.77	1.81	1.60	1.63	1.42	1.44	1.06	1.08
Earnings Effect	2004	1.87	1.90	1.68	1.71	1.50	1.52	1.12	1.14
	2005	1.92	1.94	1.73	1.75	1.53	1.55	1.15	1.16
	2006	2.07	2.10	1.86	1.89	1.66	1.68	1.24	1.26
	2007	2.34	2.39	2.10	2.15	1.87	1.91	1.40	1.43
Final Demand	2003	1.37	1.40	1.06	1.08	0.80	0.82	0.41	0.42
State Tax Effect /1	2004	1.45	1.47	1.14	1.16	0.88	0.89	0.46	0.47
	2005	1.48	1.50	1.18	1.19	0.91	0.92	0.49	0.50
	2006	1.60	1.62	1.27	1.29	0.99	1.00	0.54	0.54
	2007	1.81	1.85	1.44	1.48	1.12	1.15	0.61	0.63
Final Demand Jobs Effect /2	2003	1.47		1.32		1.18		0.88	

1/ Tax costs represent only taxes foregone from reduced public sector expenditure;
Tax expenditures not included in cumulative cost
2/ Job count not subject to discount rate

Table 7 State Taxes Generated as Percent of QHTB Tax Credits Claimed

Cumulative from Tax Year 2000 through Each Year

	Displacement of Existing Technology Sales			
	None	10%	20%	40%
2003	8.4%	7.2%	6.0%	4.0%
2004	8.2%	7.1%	6.1%	4.2%
2005	8.5%	7.5%	6.5%	4.6%
2006	9.6%	8.5%	7.4%	5.3%
2007	11.2%	9.9%	8.7%	6.3%

Table 8 2002 State Input-Output Study for Hawaii, Multipliers

	Type II Final Demand Multipliers			
	Sector	Output	Earnings	Jobs (2003)
Computer Software(Publishing)	29	1.71	0.68	14.93
Performing Arts	30	1.73	0.48	22.67
Research & Development Services	47	1.96	0.67	17.51
State and Local Government	67	1.98	0.94	27.74
Personal Consumption Expenditures	na	1.49	0.42	14.83

Source: Department of Business, Economic Development and Tourism, 2006

Some Thoughts on Analyzing the Benefits and Costs of the QHTB Investment Tax Credit

The goals of Acts 221 include creating technology jobs, nurturing certain businesses, and diversifying the economy. In a number of respects, these acts fall well short of being structured with sufficient transparencies and safeguards to determine whether these goals have been met.

Ann Chung of the Hawaii Science & Technology Council[115] stated that the intent of Act 221 is broader than the above goals. In an e-mail to the authors, Ann Chung wrote:

"Obviously, the long-term goal was to build a viable tech industry in Hawaii that would give us high-paying valuable jobs and diversify our economy. But the specific intent of 221 was to stimulate investment into our local companies… This is the reason we worked so hard on [Act] 221. There was a lot of wealth in Hawaii - but none of it was being invested in local tech companies. Without local investors, it was extremely difficult to attract mainland/outside investors. [Act] 221 was intended to stimulate both. Since we were trying to change behavior - something bold was needed - and this also had the added desired effect of generating positive global visibility for Hawaii."

Ann Chung also indicated that many intangible benefits accrue as a result of the Act 221 credit program:

"An interesting and important result of 221 [is] the increasing numbers of kama'aina that have been able to come back home because of expanding local tech companies. For decades, Hawaii has experienced a huge "brain drain", which everyone is always bemoaning. When you call some of these companies, you'll find that many of their employees are those who were brought back home - people who always wanted to come back and never thought they'd be able to. One year, we had over a hundred of these repatriates wearing t-shirts with "HiTech Hawaii Brought Me Back Home" at the legislature."

Bill Spencer, President of the Hawaii Venture Capital Association, suggested that more time is needed before measuring the benefits and costs of Act 221:

"…it is too early in the life of the program and the lives of the companies that have received funding to attempt to draw meaningful conclusions about the effectiveness of Act 221/215. Most companies that succeed beyond the first couple of years (as you know, most do not) do not reach their stride until 5-10 years out, when most of the jobs, sales and economic impact will be felt. This program was designed to last until December 31, 2010."

Technology Job Creation and the QHTB Investment Tax Credit

In the State of Hawaii, a number of figures have been reported involving the number of jobs created. For example, a 2006 article in the Honolulu Advertiser stated, "Hawaii's high technology sector grew by nearly 10 percent between 2001 and 2004 ".[116] This article implied that 1,321 technology jobs had been created during this period. [117]

The researchers of this study have been given access to data compiled from Form N-317s by the Hawaii Department of Taxation. According to this data, in 2003, 131 QHTBs reported 2,209 jobs created since business inception. By contrast, in 2002, 78 QHTBs reported 1,980 jobs created since inception.

In contrast, preliminary data prepared by the Hawaii Department of Business and Economic Development (DBEDT) show an overall decline in the total number of jobs designated as technology jobs between 2001 and 2004 (Table 9). The relative share of technology sector jobs with respect to all private sector jobs and the relative share of technology sector wages with respect to all private sector wages have also declined.

In using these data to make an inference about the relative performance of the high technology sector in Hawaii, it is important to look at external benchmarks. If the technology sector performance is strong at the national level, regional or local technology sector performance is buoyed by overall sector strength. Using Bureau of Economic Analysis data from 2001-2004, technology jobs as a share of private sector jobs in Hawaii has not changed, when compared with the performance of other states, over the period from 2001-2004.

There are pockets of strength, reflected by job and wage performance in the R&D and Testing sub-sector of the technology sector. For those who held jobs in the technology sector in 2004, the average wage increase from 2001 exceeded that of the private sector. Nevertheless, the QHTB investment tax credit has been made available to QHTB firms in the Hawaii technology sub-sectors that have under-performed the Hawaii private sector benchmark.

Using technology job data prepared by the Department of Business, Economic Development, and Tourism, however, is not without controversy. An October 15, 2006, opinion piece in the Honolulu Advertiser stated:

"…the DBEDT data erroneously included non-Act 221/215 industry sectors. A closer analysis of DBEDT's data showed a more than 23 percent increase in tech jobs in qualified Act 221/215 sectors".[118]

One of the sectors in the DBEDT technology job data is "technology manufacturing". The authors eliminated this category from the DBEDT data for 2001 to 2004 –a "non-Act 221/215 industry sector" and re-ran the numbers using DBEDT data. The technology jobs also declined during this period.[119]

The authors of this study cannot stress enough that the DBEDT's technology job creation data uses the widely accepted NAICS coding classification system. The term "performing arts products" is generally not classified as a "technology" activity for this purpose. We agree with this approach. For purposes of counting "technology" job growth, we contend that most "performing arts products" jobs should not be counted as "technology" jobs.

In this regard, what is characterized as an internal contradiction in an opinion piece in the Honolulu Advertiser (October 15, 2006) is simply not so. For example, the critics incorrectly cite a figure of 4,000 jobs reported by the Department of Taxation. Since the jobs figures reported for tax years 2002 and 2003 are jobs created since inception, by adding these figures together, the critics "double count" some of the jobs.

Many of the jobs reported by the Department of Taxation under Act 221/215 are "performing arts products" jobs. For example, for tax year 2003, 39.3% of these reported Act 221/215 jobs related to the "performing arts products" sector. The high technology investment sector often claims "performing arts products" jobs as "tech" jobs by using the phrase "tech jobs in qualified Act 221/215 sectors". [120]

A separate analysis of technology job creation uses publicly available data from the Hawaii Department of Labor and Industrial Relations (DLIR). It compares Hawaii job performance for the following sectors against the performance of total private jobs: telecommunications, professional/scientific/technical services, and a part of the information sector that includes motion picture and sound recording jobs. It generally supports the conclusions derived from the special, more detailed technology sector tabulation performed by DBEDT (Figure 1).

The authors of this report draw the inference that, when counting technology jobs, most of the difference between the DBEDT data (which uses the widely accepted NAICS system) and the Department of Taxation data (which uses taxpayer responses) is explained by the fact that DBEDT data measures "net" technology jobs[121], while the Department of Taxation measures "gross" jobs (most of which are "technology" jobs under the NAICS system). Moreover, the DBEDT and DLIR data measure "net" technology jobs creation over time while the Department of Taxation information reflects "gross" jobs at several points in time.[122]

The authors contend that the increase in "net" technology jobs is an important metric by which to measure the extent to which a vibrant and lasting technology community is being built in Hawaii.

There is no uniform definition, across states, of what constitutes a "high technology" job. Several organizations classify jobs according to SIC (now NAICS) codes. As of 2000, they included the American Electronics Association (AEA), RFA, One Source Information Systems, and Bureau of Labor Statistics (BLS). While some sectors are classified as "high technology" by all four organizations, other sectors are classified as "high technology" by less than all four organizations. As a result, the growth in high

technology employment from 1989-1999 was 24%, 26%, 14% and 15% by AEA, RFA, One Source and BLS, respectively.[123] Accordingly, the authors deferred to the expertise of the Hawaii DBEDT in classifying and counting "technology" jobs in Hawaii during this period.

Some Thoughts on Other Reasons for the Net Change in Hawaii's Technology Jobs

By its terms, Act 221 does not require a QHTB to create new technology jobs (or any new jobs, for that matter) in order for the taxpayer/investor to claim the Act 221 credit.

Example: In 2005, Taxpayer B works as an employee in Hawaii in the Information Technology (IT) department of Company C. Taxpayer B has a net worth of several million dollars from investing in Hawaiian real estate dating back to the 1970s. These real estate investments now generate significant taxable income. In 2006, Taxpayer B decides to form his own IT consulting business. Company C becomes Taxpayer B's first client. Taxpayer B borrows $800,000 against his home and contributes the money to a QHTB of which he is the sole owner. In 2006, Taxpayer B's non-refundable QHTB credit is $280,000. However, as a result of this transaction, no net new technology jobs have been created.

In 2003, the Department of Taxation attempted to verify with the Department of Labor the number of new jobs created by certain businesses claiming the QHTB credit. The Department of Taxation was roundly criticized for disclosing confidential tax information data to the Department of Labor.

It should be noted that certain investments in which no (or few) new jobs are created -- but in which Act 221 credits are claimed-- arguably represent transactions designed primarily to generate QHTB credits rather than to "encourage the continued growth and development of high technology businesses and associated industries in Hawaii". Kurt Kawafuchi, Director of Taxation, State of Hawaii, indicated that the Department of Taxation audit rate for Act 221 --taken as a whole—was less than 2%.[124]

A related issue involves companies creating so-called "drop down" subsidiaries. A company might transfer its existing IT department to a wholly owned subsidiary, which, as a QHTB, would generate Act 221 credits. Although controversial, this technique, when properly structured, is arguably legal and can result in considerable tax savings.

A March 27, 2004 article in the Honolulu Advertiser reported that a major Hawaii insurance company spun off its 17 technology employees into its wholly owned subsidiary. The subsidiary added another 10 employees. The parent company received $1.9 million in Act 221 credits.

The above example illustrates some of the challenges involved in measuring the costs and benefits of the Act 221 & Act 215 credits. How many new technology jobs have actually been created? 10? 27?

According to Kurt Kawafuchi, Director of Taxation, Act 215 has substantially reduced the use of "drop down" subsidiaries. Mr. Kawafuchi mentioned that he knew of one comfort ruling issued after the enactment of Act 215 to a business involved in a "drop down" subsidiary transaction. While this technique remains in use after Act 215, its use has been substantially reduced by Act 215.

It is also possible for a QHTB to hire employees, begin business, and then, at some later date, reduce its payroll. This could account for some of the difference between the "net" total technology jobs created during a period versus the "gross" total Act 221 jobs claimed.

With respect to the creation of new technology jobs under Act 221--now Act 215, the words "high-paying", "full time", "quality" and/or "permanent" are sometimes used. A number of Act 221/215 "success stories" exist in which jobs fitting the above descriptions have been created[125].

The Department of Taxation data indicate that some decent paying jobs are being created in Hawaii under Act 221. For example, in 2002, the average wage for the computer software activity sector was $47,997, and for the biotechnology and ocean sciences combined activity sector $47,742.[126]

Table 9

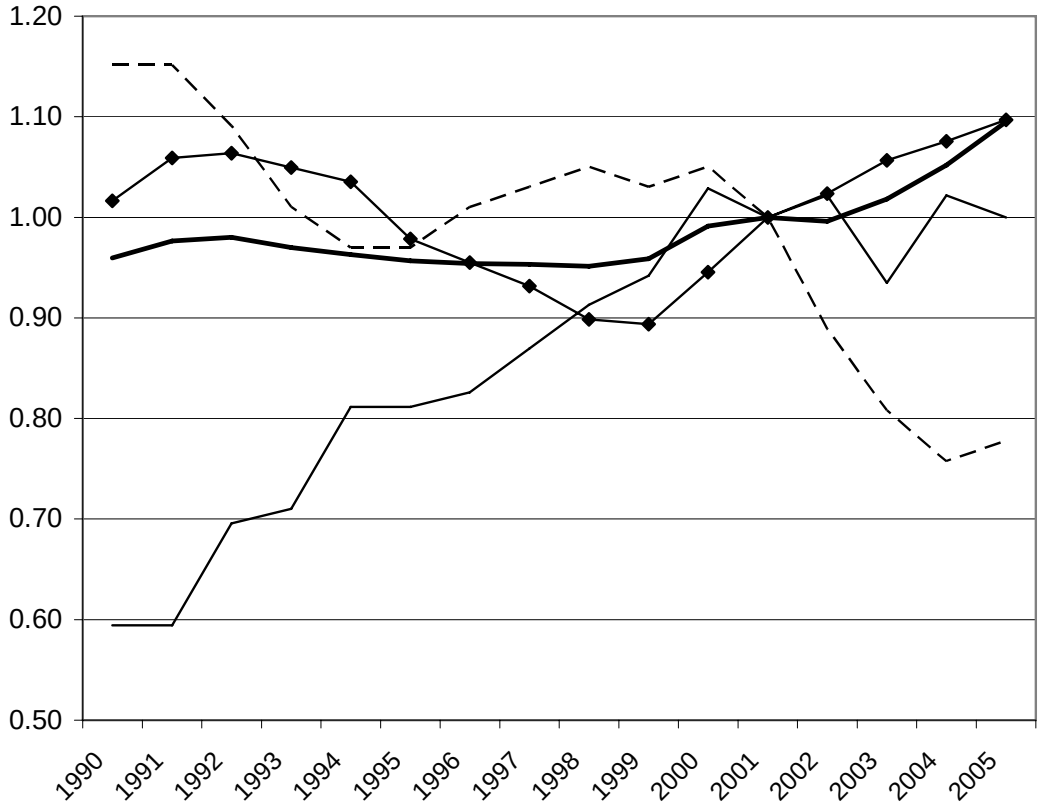
Technology Sector Job Counts and Wages: 2001-2004 (DBEDT preliminary, Sept 2006)

Major Sectors	Measure	Year				% Change
		2001	2002	2003	2004	2001-04
Scientific and Technology R&D	Jobs	3,189	3,442	3,770	3,948	23.8%
	Wages ($million)	136	151	179	195	44.0%
	Ave Wage ($)	42,500	43,911	47,383	49,429	16.3%
Manufacture of Technology Products	Jobs	653	468	342	334	-48.8%
	Wages ($million)	36	20	12	12	-66.7%
	Ave Wage	54,967	42,706	35,075	35,811	-34.9%
Technology Services	Jobs	9,622	9,466	8,991	8,823	-8.3%
	Wages ($million)	500	509	506	522	4.3%
	Ave Wage ($)	51,993	53,823	56,269	59,119	13.7%
All Private Technology	Jobs	13,463	13,376	13,104	13,106	-2.7%
	Wages ($million)	672	681	697	729	8.5%
	Ave Wage ($)	49,889	50,883	53,159	55,606	11.5%
All Private Sector		3.0%	3.0%	2.9%	2.8%	
		5.1%	4.9%	4.8%	4.6%	

Note: Unofficial, preliminary tabulation; until officially released, data are subject to change.

Source: Hawaii Department of Business, Economic Development & Tourism
Data from the Hawaii Department of Labor and Industrial Relations, Unemployment Insurance Division.

Figure 1
Job Count by Industry
2001 Base Year



Source: Hawaii Dept of Labor and Industrial Relations, Job Count by Industry

Administration and Enforcement Issues

In its 2001-2003 report, The Tax Review Commission to the State of Hawaii stated: "Audit is a very labor-intensive form of enforcement. Less than 2% of all returns are audited. Tax incentives may effectively give money away through a tax collection system that is not particularly well equipped to enforce compliance with these laws".[127]

The following appeared in an article in The Honolulu Advertiser:

"State tax officials are questioning whether they should grant one-third of the $60 million in high-technology credits claimed in 2001 and 2002". The article noted: "the Department of Taxation is auditing 23 taxpayers that claimed a total of $19.95 million worth of credits". This information came to light after the Honolulu Advertiser filed a request for records under the state's Uniform Information Practices Act." [128]

In a teleconference on October 12, 2006, Kurt Kawafuchi, Director of Taxation, State of Hawaii, disputed the above quote. Mr. Kawafuchi stressed that the news coverage did not properly reflect his comments and lacked context. He indicated that he had been referring to the refundable research and development credit rather than to the audit rate for Act 221 in general.[129]

The Director of Taxation provided the authors with the following data concerning the Act 221 audit rates:

YEAR	2001	2002	2003	2004	TOTAL
Total No. of Credit Claims	386	646	828	1309*	3,169
Number of Actual Audits	23				23
17 New Cases Selected for Audit By Year	5**	10**	16**	15**	46
Percentage Selected For Audit	7%	2%	2%	1%	2%

* - Actual claims number being finalized (2004)
** - Selected for audit

Upon audit, the "liberal construction" language contained in Act 221 tilts the playing field in favor of taxpayers for those years in which the Act 221 credit is claimed. The

Department of Taxation has indicated that the "liberal construction" language has hampered its audits.[130] In 2004, Act 215 deleted the "liberal construction" language contained in Act 221. It remains to be seen to what extent this change will have upon the number of taxpayers audited by the Department of Taxation.

A number of possibilities exist. A taxpayer claiming the Act 221 credit may or may not be entitled to claim it. A taxpayer claiming the credit may or may not be audited. If audited, depending upon the facts, the taxpayer may or may not be able to rely upon the "liberal construction" language of Act 221. If the claim is disallowed, the taxpayer may or may not litigate the issue.

In addition, audit resources may be needed to determine the extent to which, for a given year, investors in QHTBs that have either ceased to exist –or are "barely" operational —continue to claim QHTB credits.

Example: In 2001, a Taxpayer forms a solely owned Qualified High Technology Business (QHTB) by investing $2,000,000. He hires several employees. However, by 1/1/2002, the business has no employees and a business telephone that does not work. The Taxpayer works at the business but does not draw a salary. Let's assume that it is an open question whether the business satisfies the "activity" test under Act 221. If the business ceases to be a QHTB, the Taxpayer's state income tax liability will increase by an additional $70,000.[131] Of more importance, the Taxpayer cannot claim an Act 221 credit on his investment for 2002, 2003, 2004, or 2005[132]. However, if the business is a QHTB, the taxpayer can receive $500,000 in Act 221 tax credits for tax year 2002 (and possibly in later years).

Other Act 215 Administration Information Relating to the Department of Taxation

At a teleconference on October 12, 2006, the Department of Taxation made available certain information, the highlights of which are as follows:

The number of comfort rulings issued each year by the Department of Taxation through 2005:

1) 2001 Not known.
2) 2002 Not known (Pacific Business News, Sept 12, 2003, reported 80 issued in 2002).
3) 2003 Not known (Pacific Business News reported 20 issued as of 9/2003.
4) 2004 21 (?)[133] requests/ unknown number of comfort rulings issued.
5) 2005 58 requests/ 47 issued.
6) 2006 22 requests/ 20 issued (as of 10/2006).

According to the Director of Taxation, the number of QHTBs in the universe of Hawaii QHTBs is not known. In part, this is because not every business that receives

investment that qualifies for the Act 221 investment tax credit obtains a comfort ruling from the Department of Taxation.

From reviewing non-public comfort ruling requests, the Director of Taxation stated that the amount of non-Hawaii investment in Hawaii due to Act 221 is significant.

Regarding the drop-off in QHTBs reporting in 2003, compared to 2002, there is no clearly identified reason apparent to the Department of Taxation. It is possible that some QHTBs who filed in 2002 did not do so in 2003. It is possible that some QHTBs ceased to be QHTBs.

The Department of Taxation does not estimate the number of jobs created by the QHTBs. The Department of Taxation is of the opinion that the data being provided by a subset of the universe of QHTBs in Hawaii that report data to the Department of Taxation is spotty.

With regard to the discrepancy in the 'jobs reported' number, according to the Department of Taxation, there is no clear reason why the number of jobs reported by different (State) agencies is different.

Recommendations

In an attempt to measure the costs and benefits of the Act 221 investment tax credit, the authors of this study have gathered selected data from the Department of Taxation and from certain publicly available sources.

The purpose of our study is **not** to recommend whether the Act 221 credit should be continued in its present form, continued with legislative/administrative modifications, or eliminated altogether. Rather, it is to share with the Tax Review Commission our findings based upon data to which we have been given access.

It should be noted that we have made numerous requests for taxpayer data from the Department of Taxation. The Department of Taxation has provided us with certain aggregated taxpayer information. However, in our opinion, we have not received the type and amount of timely and usable taxpayer data necessary to measure the costs and benefits of the Act 221 credit in the manner in which we had originally anticipated.

The Act 221 tax credit program has raised significant capital for investment in high technology companies. However, this is an intermediate outcome. Due to the large public subsidy involved, the test of the effectiveness of the statute should include whether new –as in not otherwise operated—high technology enterprises are formed, and, as viable entities, increase the State of Hawaii's economic base.

As a general proposition, if we are to assume that tax incentives are unlikely to be abandoned by the State of Hawaii as an economic policy tool, then we recommend that certain ground rules be adopted to minimize the economic distortions created by this tax incentive. At a minimum, the Act 221 credit program should be treated as tax expenditures and should bear the burden of proof in order to justify their continued existence. These ground rules should be based upon the principles of cost-effectiveness and transparency.

These ground rules should also include: "1) conducting cost-benefit studies prior to beginning new tax incentive programs or making awards to firms in targeted sectors, taking into account not just fiscal, but social costs and the cost of public opportunities foregone; 2) conducting periodic evaluations of all tax incentive programs; 3) requiring sunset provisions; 4) requiring transparency in all aspects--legal basis, economic consequences, and administrative procedures; 5) utilizing simple, objective qualifying criteria to minimize discretionary application and to ease enforcement and monitoring."[134]

In order to more properly measure both the costs and benefits of the Act 221 investment tax credit and/or to increase transparency, we recommend the following:

1) The Department of Taxation should collect –and make public-- more extensive and timely taxpayer data relating to the Act 221 investment tax credit.

2) The Department of Taxation should examine its internal processes to better automate the process of collecting the information contained on Forms N-317, N-318 and N-318A. [135]

3) To maintain QHTB status, Form N-317 should be timely filed on an annual basis. Currently, a QHTB that receives no new cash investment in a given year may refrain from filing Form N-317 for that year.

4) Forms N-317, N-318, and N-318A should be re-designed.

5) The names, addresses, and telephone numbers of QHTBs receiving the Act 221 investment tax credit should be made publicly available.

6) The amount of Hawaii investment and non-Hawaii investment in Hawaii should be tracked at the QHTB level and reported yearly.

7) Significant audit resources should be devoted towards verification of QHTB status for purposes Act 221/215 compliance.

8) We recommend that the Department of Taxation be given additional resources to administer and enforce the Act 221 credit program.

Final October 23, 2006

Appendix A

At the October 6, 2006, presentation of the draft report on "Measuring the Costs and Benefits of Hawaii's Qualified High Technology Business (QHTB) Investment Tax Credit," Commissioner Grandy requested that additional tables be developed to:

1) illustrate the dollar amount of the costs and benefits of the QHTB investment tax credit
2) illustrate the rate of return for investments that qualify for the QHTB investment tax credit

The tables are appended here, with documentation for their development.

Cost – Benefit Analysis of Hawaii's QHTB Investment Tax Credit

Cost Data

Investments made during Tax Years 2000, 2001, 2002, and 2003 identify a corresponding future credits claimed stream. This stream is developed from actual credits claimed, the tax credit aging schedule developed from these investments, and historical amounts of tax credit carryover. Investments made in any of the tax years generate credits claimed over a five year period, and longer with credit carryover. At a minimum, the cost stream of credits claimed in this study covers the period from Tax Year 2000 through Tax Year 2007.

To determine the present value, as of tax year 2003, for tax credits claimed in any of the tax years covered in this analysis, the amount of tax credits claimed in each tax year is normalized to the year 2003. Tax credits claimed before 2003 are adjusted forward, and tax credits claimed after 2003 are adjusted backward to 2003, using the same discount rate. The present value of the tax credits through 2003 is the sum of the annual adjusted tax credits from 2000 through 2003. The present value of the tax credits through 2007 is the sum of the annual adjusted tax credits from 2000 through 2007.

The present value of the tax credits through a given tax year is modified by multiplier values (output, earnings, state tax, jobs), to arrive at a measure of the economy-wide present value cost of the QHTB investment tax credit. DBEDT's 2002 State Input-Output Study for Hawaii publishes multiplier values for 67 industry sectors. Multiplier values representing the State and Local government sector are used to measure the cost impact of the QHTB investment tax credit, when it is assumed that public program spending, in the amount of the tax credits claimed, is the foregone opportunity cost. Multiplier values representing Personal Consumption Expenditure

for the household sector are used to the measure the cost impact of the investment tax credit, when it is assumed that public programs are maintained at pre tax credit levels, but that other taxes (income tax, for example) need to be raised in order to support the tax credit expenditures.

DBEDT's published multipliers are of two general types: Type I multipliers and Type II multipliers. The study utilizes Type II multipliers as the broadest measure of the cost impact of the QHTB investment tax credit program. Type I multipliers represent direct and indirect (inter-industry) effects as a multiple of the direct effects. Type II multipliers represent direct, indirect, and induced (income-induced household spending) as a multiple of the direct effects.

Benefit Data

QHTB gross revenue data from the Department of Taxation for tax year 2003 identify the sales of QHTBs who reported, by qualified research activity. This study categorizes these qualified research activities to align, as best possible, with NAICS type industry sectors. The assignment process facilitates the use of DBEDT's multiplier values that are defined in terms of these industry sectors. Computer software design sales are assigned to the Publishing (including Internet) sector. Performing arts sales are assigned to the Motion Picture and Sound Recording sector. IRC section 41(d), biotechnology, sensor and optic technologies, ocean sciences, ocean science, astronomy, and non-fossil fuel energy related technology sales are combined to form an aggregate and assigned to the R&D in the Physical, Engineering and Life Sciences sector. Revenues reported under a Multiple category are allocated to the three prior sectors (publishing, motion picture, and R&D) by business unit count share. Allocation by dollar sales did not yield very different results and are not reported here.

The analysis assumes that the 2003 level of QHTB sales activity remains constant in real terms. This identifies the base of the future benefit stream. No further investment in QHTBs established as of 2003 is assumed to occur. The absence of QHTB firm data precludes estimates of sales activity growth financed by retained earnings or other sources of investment funds.

Economy wide QHTB benefits in 2003 are derived by applying sectoral multiplier values for the computer software design, performing arts and an aggregate R&D sectors, including amounts allocated from the Multiple category, to their respective sales in 2003. Benefits occurring prior to 2003 are estimated, using a two year average of estimated QHTB investments and a proportionality factor derived from 2003 data, and are adjusted forward. Benefits after 2003 are held constant in real terms and are adjusted backward to 2003. Both adjustments use the same discount rate. The present value of QHTB benefits through 2003 is the sum of the annual adjusted benefits from 2000 through 2003. The present value of QHTB benefits through 2007 is the sum of the annual adjusted benefits from 2000 through 2007.

Whether the QHTB investment tax credit affects incremental investment and firm sales above what would have occurred without the credit is an unanswered question. The kinds of activities and sales that would have occurred without the credit include: sales that a firm would have produced even without the credit, sales by QHTBs that replace or displace sales by non-QHTB technology firms, sales by QHTBs that are "drop down" subsidiaries of an existing firm.

The reported 2003 Hawaii QHTB sales could include effects of the phenomenon described above. The term "displacement" is here used to describe the amount of activities and sales that would have occurred without the credit and are "displaced" by QHTB investment tax credit activities. Sensitivity analysis for various levels of displacement, 10 percent, 20 percent, and 40 percent, are examined. Two discount rates are utilized: a ten percent rate represents pre-tax long term return on U.S. equities; a seven percent discount rate represents after tax return.

Estimates of the benefit-to-cost ratio appear in the main body of the report. Estimates of the underlying present value (2003 base year) benefits and costs in each of the years 2003 through 2007 appear in Table A1 through Table A4.

Rate of Return Illustrations

The authors interviewed three individuals who participate in Hawaii's venture capital market in order to better learn how venture capital markets operate, both here in Hawaii and on the U.S. Mainland.[136] We asked all three to identify the typical rate of return on venture capital investments. Since venture capital typically finances high risk business start-ups, rate of return estimates are based on capital gains realized after a period of time, which varies from five to ten years, when the venture capital investor exits the investment through the sale of equity.

Rough industry experience suggests that during this phase, 80 to 90 percent of good quality high risk business startups fail, but that the 20 percent that succeed will return some high multiple of the original investment. This multiple is reported to range from 5-times investment in 3 years, to 8-times in 5 years, to 10-times in 10 years. Early stage venture capital investment returns are also reported to range from 15 percent to 25 percent annual rates.

An October 15, 2006, article by Mike Fitzgerald, notes that "one goal specifically contemplated by the Legislature was to attract capital from the Mainland, foreign, and tax-exempt sources by permitting the allocation of credits from their investments to Hawaii taxpayers. Act 221/215 has fostered these new sources of capital."[137]

While there have been no published data of the extent to which outside capital is flowing to Hawaii to finance QHTBs or other non-QHTB high technology businesses, Jeffrey Au has suggested this amount may be as much as 40 percent of the total QHTB investment.[138]

The illustrations developed in Table A5 and Table A6, utilize the following assumptions:

1) Venture capital exits at the end of five years
2) Eighty percent of high technology business startups fail during this five year period
3) Capital gains on the twenty percent of the high technology business startups that survive this period range from multiples of 8-times investment to 4-times investment
4) Non Hawaii investment to Hawaii investment ratios are examined across two ratio values: 40 percent non-Hawaii to 60 percent Hawaii sourced investment; 50 percent non-Hawaii to 50 percent Hawaii sourced investment.
5) On an illustrative $100 investment, $1 or 1% of equity is traded for each $1 of QHTB tax credit, in arrangements where Hawaii investors trade their equity for the QHTB tax credit.

Table A1
Benefit and Costs of QHTB Tax Credit Program
2000 - 2003 Investments in QHTBs
Tax Expenditures Reduce Other Government Spending
Discount Rate = 10 %

			Cumulative Benefits Displacement of Existing High Tech Sales			
		Cumulative Costs	None	10%	20%	40%
Final Demand	2003	156.39	160.87	144.78	128.69	96.52
Output Effect	2004	225.12	244.47	220.02	195.57	146.68
($million)	2005	288.11	320.47	288.42	256.37	192.28
	2006	324.57	389.56	350.60	311.65	233.74
	2007	335.07	452.37	407.13	361.90	271.42
Final Demand	2003	75.00	59.42	47.53	53.47	35.65
Earnings Effect	2004	107.97	90.29	72.23	81.26	54.18
($million)	2005	138.18	118.36	94.69	106.53	71.02
	2006	155.66	143.88	115.11	129.49	86.33
	2007	160.06	167.08	133.66	150.37	100.25
Final Demand	2003	6.94	8.44	7.27	6.17	4.19
State Tax Effect 1/	2004	9.99	12.82	11.21	9.68	6.82
($million)	2005	12.79	16.80	14.80	12.87	9.22
	2006	14.41	20.43	18.06	15.76	11.39
	2007	14.81	23.72	21.02	18.40	13.37
Final Demand Jobs Effect /2	2003	1,078	847	762	678	508

1/ Tax costs represent only taxes foregone from reduced public sector expenditure; Tax expenditures not included in cumulative cost

2/ Job count not subject to discount rate

Table A2
Benefit and Costs of QHTB Tax Credit Program
2000 - 2003 Investments in QHTBs
Tax Expenditures Reduce Other Government Spending
Discount Rate = 7 %

			Cumulative Benefits Displacement of Existing High Tech Sales			
		Cumulative Costs	None	10%	20%	40%
Final Demand	2003	153.54	160.87	144.78	128.69	96.52
Output Effect	2004	224.21	246.81	222.13	197.45	148.09
($million)	2005	290.78	327.13	294.42	261.71	196.28
	2006	330.38	402.20	361.98	321.76	241.32
	2007	340.62	472.36	425.12	377.89	283.41
Final Demand	2003	73.64	59.42	53.47	47.53	35.65
Earnings Effect	2004	107.53	91.16	82.04	72.93	54.70
($million)	2005	139.45	120.82	108.74	96.66	72.49
	2006	158.45	148.55	133.70	118.84	89.13
	2007	163.36	174.46	157.02	139.57	104.68
Final Demand	2003	6.82	8.44	4.19	6.17	7.27
State Tax Effect 1/	2004	9.95	12.94	6.90	9.78	11.32
($million)	2005	12.91	17.15	9.43	13.15	15.11
	2006	14.66	21.09	11.79	16.29	18.66
	2007	15.12	24.77	13.99	19.24	21.97
Final Demand Jobs Effect /2	2003	1,078	847	762	678	508

1/ Tax costs represent only taxes foregone from reduced public sector expenditure; Tax expenditures not included in cumulative cost

2/ Job count not subject to discount rate

Table A3
Benefit and Costs of QHTB Tax Credit Program
2000 - 2003 Investments in QHTBs
Tax Credits Offset by Increased Personal Income Tax
Discount Rate = 10 %

			Cumulative Benefits Displacement of Existing High Tech Sales			
		Cumulative Costs	None	10%	20%	40%
Final Demand Output Effect ($million)	2003	118.89	160.87	144.78	128.69	96.52
	2004	171.14	244.47	220.02	195.57	146.68
	2005	219.02	320.47	288.42	256.37	192.28
	2006	246.74	389.56	350.60	311.65	233.74
	2007	253.71	452.37	407.13	361.90	271.42
Final Demand Earnings Effect ($million)	2003	33.51	59.42	53.47	47.53	35.65
	2004	48.24	90.29	81.26	72.23	54.18
	2005	61.74	118.36	106.53	94.69	71.02
	2006	69.55	143.88	129.49	115.11	86.33
	2007	71.51	167.08	150.37	133.66	100.25
Final Demand State Tax Effect 1/ ($million)	2003	6.14	8.44	6.54	4.94	2.52
	2004	8.84	12.82	10.09	7.74	4.09
	2005	11.32	16.80	13.32	10.29	5.53
	2006	12.75	20.43	16.25	12.61	6.83
	2007	13.11	23.72	18.92	14.72	8.02
Final Demand Jobs Effect /2	2003	1,078	847	762	678	508

1/ Tax costs represent only taxes foregone from reduced public sector expenditure; Tax expenditures not included in cumulative cost

2/ Job count not subject to discount rate

Table A4
Benefit and Costs of QHTB Tax Credit Program
2000 - 2003 Investments in QHTBs
Tax Credits Offset by Increased Personal Income Tax
Discount Rate = 7 %

			Cumulative Benefits Displacement of Existing High Tech Sales			
		Cumulative Costs	None	10%	20%	40%
Final Demand	2003	116.72	160.87	144.78	128.69	96.52
Output Effect	2004	170.44	246.81	222.13	197.45	148.09
($million)	2005	221.05	327.13	294.42	261.71	196.28
	2006	251.16	402.20	361.98	321.76	241.32
	2007	258.94	472.36	425.12	377.89	283.41
Final Demand	2003	32.90	59.42	53.47	47.53	35.65
Earnings Effect	2004	48.04	91.16	82.04	72.93	54.70
($million)	2005	62.31	120.82	108.74	96.66	72.49
	2006	70.80	148.55	133.70	118.84	89.13
	2007	72.99	174.46	157.02	139.57	104.68
Final Demand	2003	6.03	8.44	6.54	4.94	2.52
State Tax Effect 1/	2004	8.81	12.94	10.19	7.82	4.14
($million)	2005	11.42	17.15	13.60	10.52	5.66
	2006	12.98	21.09	16.79	13.04	7.07
	2007	13.38	24.77	19.77	15.39	8.40
Final Demand Jobs Effect /2	2003	1,078	847	762	678	508

1/ Tax costs represent only taxes foregone from reduced public sector expenditure; Tax expenditures not included in cumulative cost

2/ Job count not subject to discount rate

Table A5
Illustrative Expected Return over 5 Years on a $100 QHTB Investment in a QHTB /1
50% Hawaii - 50% Non Hawaii Investment

	QHTB Investment Tax Credit Multiple			Investment without Tax Credit
	2.0	1.5	1.0	
Expected Return Before Tax – 5 Year Capital Gains $800				
Hawaii Investor	$50	$65	$80	$40
Non-Hawaii Investor	$120	$80	$40	$40
State QHTB Tax Credits	-$100	-$75	-$50	$0
Hawaii Investor	100%	130%	160%	80%
Non-Hawaii Investor	240%	160%	80%	80%
Expected Return Before Tax – 5 Year Capital Gains $600				
Hawaii Investor	$50	$55	$60	20
Non-Hawaii Investor	$80	$50	$20	20
State QHTB Tax Credits	-$100	-$75	-$50	0
Hawaii Investor	100%	110%	120%	40%
Non-Hawaii Investor	160%	100%	40%	40%
Expected Return Before Tax – 5 Year Capital Gains $400				
Hawaii Investor	$50	$45	$40	$0
Non-Hawaii Investor	$40	$20	$0	$0
State QHTB Tax Credits	-$100	-$75	-$50	$0
Hawaii Investor	100%	90%	80%	0%
Non-Hawaii Investor	80%	40%	0%	0%

1/ Average firm failure rate of 80% over 5 year venture capital phase

Table A6
Illustrative Expected Return over 5 Years on a $100 QHTB Investment in a QHTB /1
60% Hawaii – 40% Non Hawaii Investment

	QHTB Investment Tax Credit Multiple			Investment without Tax Credit
	1.67	1.5	1.0	
Expected Return Before Tax – 5 Year Capital Gains $800				
Hawaii Investor	$40	$46	$96	$48
Non-Hawaii Investor	$128	$112	$32	$32
State QHTB Tax Credits	-$100	-$90	-$60	$0
Hawaii Investor	67%	77%	160%	80%
Non-Hawaii Investor	320%	280%	80%	80%
Expected Return Before Tax – 5 Year Capital Gains $600				
Hawaii Investor	$40	$42	$72	$24
Non-Hawaii Investor	$88	$76	$16	$16
State QHTB Tax Credits	-$100	-$90	-$60	$0
Hawaii Investor	67%	70%	120%	40%
Non-Hawaii Investor	220%	190%	40%	40%
Expected Return Before Tax – 5 Year Capital Gains $400				
Hawaii Investor	$40	$38	$48	$12
Non-Hawaii Investor	$48	$40	$0	$8
State QHTB Tax Credits	-$100	-$90	-$60	$0
Hawaii Investor	67%	63%	80%	20%
Non-Hawaii Investor	120%	100%	0%	20%

1/ Average firm failure rate of 80% over 5 year venture capital phase

Final October 23, 2006

Appendix B

DBEDT issued a 2001-2005 report on technology job counts and wages on October 23, 2006 (Table B1),[139] after the date of our Final Report. The total job count grows by 350, with the only growth occurring in the Scientific and Technology R&D sector. Of this increase, one third is accounted for by seed corn research in 2005. This is quite understandable given that a business can get a refundable Hawaii R&D credit based upon a portion of R&D expenditures. If the business is a QHTB, its investors can also qualify for a nonrefundable Act 221 credit based upon the amount invested in a QHTB. Under Act 215, the business has to be a QHTB in order to get the refundable "R&D" credit.

The body of our report looks at DBEDT 2001-2004 preliminary data. These data show a decrease in "technology jobs" using NAICS codes. The DBEDT 2001-2005 technology jobs data just released show a mild increase.

Specifically, the new DBEDT data show a 2.6 percent increase in "all private technology" jobs in Hawaii from 2001-2005. It is important to note that growth in "all private sector jobs" in Hawaii is 9.2 percent for this period. Stated alternatively, the rate of growth in "all private technology" jobs in Hawaii is about one-fourth of the growth in "all private sector jobs." Thus, the relative share of technology sector jobs and technology sector wages with respect to those of the private sector still decline over the period from 2001 to 2005, the same as was reported using earlier data for 2001-2004.

In using these data to make an inference about the relative performance of the high technology sector in Hawaii, it is important to look at external benchmarks. If the technology sector performance is strong at the national level, regional or local technology sector performance is buoyed by overall sector strength. Using Bureau of Economic Analysis data from 2001-2004, technology jobs as a share of private sector jobs in Hawaii have fared no better than the performance of other states, over the period from 2001-2004. Federal data for the 2001-2005 period are not yet publicly available

Table B1
Technology Sector Job Counts and Wages: 2001-2005 (Oct 2006)

Major Sector	Measure	Year 2001	2002	2003	2004	2005 est	% change 2001-2005
Scientific and	Jobs	1,911	2,045	2,243	2,379	2,600	36.1%
Technology R&D	Wages ($million)	87	96	115	130	148	70.4%
	Ave. Wage ($)	45,485	46,847	51,461	54,616	56,942	25.2%
Manufacture of	Jobs	653	468	342	334	391	-40.1%
Technology	Wages ($million)	36	20	12	12	17	-53.6%
Products	Ave. Wage ($)	54,967	42,706	35,075	35,811	42,552	-22.6%
Technology	Jobs	10,900	10,863	10,518	10,393	10,822	-0.7%
Services	Wages ($million)	549	565	569	587	629	14.6%
	Ave. Wage ($)	50,357	51,995	54,109	56,468	58,120	15.4%
All Private	Jobs	13,463	13,376	13,104	13,106	13,813	2.6%
Technology	Wages ($million)	672	681	697	729	794	18.2%
	Ave. Wage ($)	49,889	50,883	53,159	55,606	57,458	15.2%
All Private	Share of Tech Jobs	3.0%	3.0%	2.9%	2.8%	2.8%	
Sector	Share of Tech Wages	5.0%	4.9%	4.8%	4.6%	4.7%	

Source: Hawaii Department of Business, Economic Development & Tourism, Oct 2006
Data from the Hawaii Department of Labor and Industrial Relations, Unemployment Insurance Division

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Endnotes

[1] Act 221 (of 2001) became incorporated into the Hawaii Revised Statutes in Chapter 235, Section 110.9 . In Hawaii, each year a "Bill" becomes an "Act" when passed by the legislature and signed into law by the governor. The "Act" is then incorporated into the Hawaii Revised Statutes. Thus Act 221 (of 2001) refers to different subject matter than Act 221 (of 2002). (An informative and entertaining treatment of this subject – along with links to the Hawaii Revised Statutes— can be found at http:hawaiifilmoffice.blogspot.com).

[2] The instructions to State of Hawaii—Department of Taxation Form N-318 indicate that, in the year in which the investment in a QHTB is made, the taxpayer's Act 221 credit is 35% of investment up to a maximum credit of $700,000 per each qualified high technology business. On a $2,000,000 investment, over 5 years, a taxpayer can receive a total of $2,000,000 in Act 221 credits. See also HRS 235-110.9.

[3] For purposes of this report, "Act 221 (of 2001)" will be referred to as "Act 221". "Act 221" is also often used when referring to the high technology business investment tax credit program.

[4] Act 215 (of 2004) is sometimes referred to as Act 221/215 or Act 221/ Act 215. Even after the passage of Act 215 (of 2004), the high technology business investment tax credit remains commonly known as "Act 221". The Honolulu Advertiser sometimes refers to it as "Act 221 (now known as Act 215)." See HRS 235-110.9.

[5] Hoffman, Mary Ann, "The State Corporate Income Tax: A Synthesis of Student Research," Journal of Accounting Literature 21 (2002): 76-119.

[6] Fox, William F., and LeAnne Luna, "State Corporate Tax Revenue Trends: Causes and Possible Solutions," National Tax Journal 55 No. 3 (September, 2002): 491-508.

[7] Fox and Luna (2002).

[8] Id.

[9] Id.

[10] Id.

[11] Wasylenko, W., "Taxation and Economic Development: The State of the Economic Literature," New England Economic Review (March/April 1997): 37-52.

[12] Cornia, Gary, Kelly D. Edmiston, David L. Sjoquist and Sally Wallace, "The Disappearing State Corporate Income Tax," National Tax Journal 58 No. 1 (March, 2005): 115-38.

[13] Cornia, et al. (2005).

[14] Id.

[15] The authors examined corporate tax panel data from 44 states. Of these, 30 states have trends reflecting the divergence between Gross State Product (GSP) and state corporate income tax (SCIT) revenues. For 23 of these 30 states, the divergence between GSP and SCIT revenues is continuous. While some of these 30 states show

relatively minor divergence between GSP and SCIT revenues, 5 states show very large divergences over the past two decades. Hawaii is 1 of these 5 states. Cornia, et al (2005).

[16] Multistate Tax Commission, "Corporate Tax Sheltering and the Impact on State Corporate Income Tax Revenue Collections," State Tax Notes 20 No. 3 (July 21, 2003): 237-41.

[17] Multistate Tax Commission (2003).

[18] Council on State Taxation. "Abusive Tax Shelters Should Be Curtailed, but the Multistate Tax Commission's Exaggerated Numbers Aren't Helpful to the Debate." *State Tax Notes 19 No. 4* (July 28, 2003): 309-14.

[19] Council on State Taxation (2003).

[20] Id.

[21] Id.

[22] Id.

[23] Petroni, K. and D. Shackelford, "Managing Annual Accounting Reports to Avoid State Taxes: An Analysis of Property-Casualty Insurers," The Accounting Review 74(3) (1999): 371-393.

[24] Petroni and Shakleford (1999).

[25] Jeff Au, Managing Director, PacifiCap Group, LLC, questioned the authors' decision to search the Internet for relevant "business climate" studies relating to Hawaii and to include the results of such studies in the Draft Report. Mr. Au shared the following: "You might want to interview Act 221 investors to measure the extent that negative politics and press spin surrounding Act 221 has affected the "Business Climate" in Hawaii and our state's grade of "F" for "business vitality" and "development capacity." This also can be well documented by comparing the numerous press articles with negative "press spin" on Act 221 over the past 5 years with empirical data subsequently released by the Department of Taxation to date. If there is a large discrepancy between them, then the question is what and who are the sources of these discrepancies and why. Out of curiosity, are the press articles and secondary sources you quote ones that you independently found from your own research, or were they provided to you by someone?"

[26] The "Development Report Card for the States" (2006) is available at the website www.cfed.org (the official website for the nonprofit organization founded as the Council for Economic Development).

[27] The Milken Institute State Technology and Science Index (2002) is available at www.MilkenIstitute.org .

[28] The Milken Institute's Cost of Doing Business Index (2005) is also available at www.MilkenIstitute.org .

[29] "This index measures wage costs, taxes, electricity costs and real estate costs for industrial and office space. Each state is measured on the five individual categories, and those weighted scores are compiled to make the overall index". See Milken (2006)

[30] See "Forbes Ranks Hawaii Low for Doing Business" in the Pacific Business News (Honolulu), (August 17, 2006).

[31] See "Trouble in Paradise: Why Doing Business in Hawaii Has Become Nearly Equivalent to Suicide" (2002) available on the website www.forbes.com .

[32] Zee, Howell H., Janet G. Stotsky, and Eduardo Ley, "Tax Incentives for Business Investment: A Primer for Policy Makers in Developing Countries," World Development Vol. 30 No. 9 (2002): 1497-1516; Christopher Grandy, "Tax Incentives and the Public/Private Boundary," Unpublished manuscript, University of Hawaii Public Administration Program. (2003); Joseph Toy and James Mak, "Tax Incentives in Tourism: Hawaii's Hotel Remodeling and Construction Tax Credits," Unpublished manuscript, University of Hawaii Economics Program (July, 2003).
[33] Buss, Terry F., "The Effect of State Tax Incentives on Economic Growth and Firm Location Decisions: An Overview of the Literature," Economic Development Quarterly 15 No. 1 (February, 2001): 90-105.
[34] Zee, Stotsky and Ley (2002), p.1499.
[35] Id. p.1498.
[36] Buss (2001), p. 101.
[37] Zee, Stotsky and Ley (2002), p.1510; Buss (2001), p.101.
[38] The Report of the 2001-2003 Tax Review Commission (State of Hawaii), p.8.
[39] The "Development Report Card for the States" (2006).
[40] Sandler, Daniel, "Tax Incentives and Informal Venture Capital: Of Love and Angels," NASVF- NetNews 9255. Vol. 8, No. 28 (2004). Reproduced as "Tax Incentives and Informal (Angel) Capital: Federal & State Incentive Review and Commentary" in VC Experts, The Encyclopedia of Private Equity and Venture Capital, Book 3: Angels/Founders Round, section 3.5.5. http://www.nasvf.org
[41] Sandler (2006).
[42] Id.
[43] Id.
[44] Id.
[45] Id.
[46] Id.
[47] Id.
[48] Florida, Richard and Donald F. Smith, Jr., "Venture Capital Formation, Investment, and Regional Industrialization," Annals of the Association of American Geographers, vol. 83, No. 3. (Sept., 1993), p. 437.
[49] Sandler (2006)
[50] State Credit Incentives for Equity Investments: A Study of Current Practices. National Association of Seed and Venture Funds. p.4 (2004).
[51] State Credit Incentives for Equity Investments: A Study of Current Practices. National Association of Seed and Venture Funds. p.4 (2004).
[52] State Credit Incentives for Equity Investments: A Study of Current Practices. National Association of Seed and Venture Funds. p.4 (2004).
[53] In 2003, Hawaii's GDP per capita of $30,913 exceeded the national median.
[54] See Appendix C, 1995-2005 PriceWaterhouseCoopers MoneyTree Survey, in (NASVF) Fostering Innovation Capital, Seed and Venture Capital, State Experiences and Options (May, 2006).
[55] 1995-2005 PriceWaterhouseCoopers MoneyTree Survey.
[56] Act 221 (of 2001) became incorporated into the Hawaii Revised Statutes in Chapter 235, Section 110.9.

[57] HRS Section 235-110.9(e).
[58] Act Section 215 changed the definition of "qualified research" as it relates to the "development and design of computer software."
[59] The 2004 legislation removed the Act 221 language "using fourth generation or higher software development tools or native programming languages to design and construct unique and specific code to create applications and design databases for sale or license."
[60] This assumes that all applicable sources of Hawaiian state tax law –including Act Section 221 and Act Section 215-- are satisfied.
[61] In Year 3, the credit recapture amount is computed as follows: 10% ($700,000 + $500,000).
[62] In Year 5, the credit recapture amount is computed as follows: 10% ($400,000 + $200,000).
[63] In Year 2, the credit recapture amount is computed as follows: 10% ($700,000).
[64] The total "lost" Act 221 credit over these 4 years (Years 2-5) will be $1.3 million.
[65] Tax Information Release No. 2003-01 (March 17, 2003).
[66] Id.
[67] In this example, Taxpayer A has an Act 221 credit multiple of 4:1. Act 215 (of 2004) codifies the economic substance and business purpose doctrines. (See also "Presumption Relating to Doctrines of Economic Substance and Business Purpose" section of the Final Report). Please note that credit multiples of 1.5 or greater --but less than 2.0-- may be reviewed by the Department of Taxation for purposes of applying these doctrines. Where the credit multiple rate is greater than 2.0, the QHTB must substantiate economic merit and business purpose.

While the Department of Taxation reviews information for purposes of issuing comfort rulings, the Department of Taxation has indicated that it does not know how many QHTBs exist "in the universe of QHTBs". The reason is that a business does not have to obtain a comfort ruling in order to be a QHTB. While the credit multiple for QHTBs that do not seek a comfort ruling can be determined upon audit, for certain years, the audit rate is less than 2%, and for some years, less than 1%. (See "Audit Rate" section of this Final Report).
[68] Ray Kamikawa, former Tax Director and currently an attorney in Honolulu, Hawaii, is often referred to as the architect of Act 221.
[69] This last sentence came from contemporaneous notes taken by one of the authors of this Final Report. For this reason, the authors did not include it in quotes.
[70] Id.
[71] Id.
[72] Id.
[73] Id.
[74] Id.
[75] Id.
[76] Tax Information Release No. 2003-01 (2003).
[77] Id.
[78] Id.

[79] Id.
[80] Department of Taxation Announcement No. 2003-01 (April 8, 2003).
[81] Form N-318 is entitled "High Technology Business Investment Tax Credit".
[82] Form N-317 is entitled "Statement by a Qualified High Technology Business".
[83] Form N-318A is entitled "Statement of Investment in a Qualified High Technology Business".
[84] Act Section 215 (2004).
[85] October 12, 2006, teleconference between authors and members of the Department of Taxation. The Director of Taxation presumably uses the term "universe of QHTBs" to refer to all QHTBs (those for which comfort rulings have been made and have not been made). It should be possible for the Department of Taxation to track QHTBs for certain years – especially after the enactment of Act 215 (2004)—but the Department of Taxation could not make this information available to the authors.
[86] Ted Liu quoted in "Tax Incentive Issues Still Tops At Legislature" by Terrence Sing. Pacific Business News (Honolulu). February 6, 2004.

In an e-mail dated October 11, 2006, Jeffrey Au, Managing Director, PacifiCap Group, LLC shared the following thoughts: "Regarding the quote from DBEDT Director Ted Liu that 'Liberal construction has not achieved its purpose, rather it's done the opposite by overloading the Department of Taxation in reviewing proposals they shouldn't be.' Have you asked Mr. Liu what empirical data supports this assertion and how he obtained it, given that requests to the Tax Department are confidential and should not be accessable to DBEDT? Have you asked Tax Director Kawafuchi if he agrees with this conclusion, and if so, what empirical evidence there is to back it up, e.g., how many proposals had to be reviewed that shouldn't have been, but for 'liberal construction?'."
[87] Jeffrey Au, Managing Director, PacifiCap Group, LLC, shared the following thoughts: "The RFP for your study expressly required the analysis of several different tax credits. Such an analysis would provide a comparative perspective in evaluating the Act 221 Investment Tax Credit. Yet, your study only analyzes one credit. Why is this? Did you independently decide to study just this one credit, or were you instructed to do so, and if so, by whom and why? Is this in violation of the RFP, and more broadly, state procurement laws?"
[88] The authors had difficulty obtaining certain aggregate information from the Department of Taxation. For example, the authors made several e-mail requests asking for a "count" of the total number of QHTBs in existence for each of the years 2001-2005. Due to changes in the tax forms –and the way in which certain tax forms are constructed—the Department of Taxation was not able to provide us with this information at a telephone conference on Thursday, October 12, 2006.

In some cases, the Department of Taxation provided us with aggregate information after numerous requests. The authors sent a number of e-mails to the Department of Taxation. One of the items requested was a "count" of the total number of comfort rulings issued from 2001-2005 by the Department of Taxation. Six days after the Draft Report presentation was made to the Tax Review Commission, the authors learned the

answer to this question at a teleconference with members of the Department of Taxation.

[89] By way of contrast, the State of Maine is known for the generous incentives it offers through its Seed Capital Tax Credit program. Maine offers tax credits equal to 40% of the investment (60% for investments made in businesses located in high unemployment areas).

[90] National Association of Seed and Venture Funds (NASVF), Fostering Innovation Capital, Seed and Venture Capital, State Experiences and Options (May, 2006), p 14-15.

[91] (NASVF) Fostering Innovation Capital, Seed and Venture Capital, State Experiences and Options (May, 2006).

[92] 2003 PriceWaterhouseCoopers MoneyTree Survey. See also State Credit Incentives for Equity Investments: A Study of Current Practices. National Association of Seed and Venture Funds (2004), p.5.

[93] Hawaii ranked 38th out of 53. The study ranked all 50 states along with "DC," "Puerto Rico," and "Undisclosed/Other."

[94] 0.098%.

[95] Hawaii's relative share of private institutional venture capital investment from 1995-2005 was 0.098%. Its relative share from 2001-2005 was .08%.

[96] It should be noted that, over time, the number of states offering such programs is subject to fluctuation.

[97] Allegis Capital is a $500 million venture capital fund based in California.

[98] "Allegis Capital Director Says Act 221 Needs Fixing," by David Butts, The Honolulu Advertiser, (June 30, 2003) posted on the website HonoluluAdvertiser.com . It should be noted that the NASVF estimates that, in 2005, total private institutional venture capital was $21 billion and total angel investment was $23 billion.

[99] Id. In response to Barry Wienman's quote, Jeffrey Au, Managing Director, PacifiCap Group, LLC, shared the following thoughts in an e-mail to one of the authors: "Could you clarify the logic of Mr. Weinman's quote that 'Act 221. . .discourages the formation of a large pool of capital here. . . ' Pension funds, endowments and trusts are primarily nonprofits that pay no tax and for whom tax credits have no impact. How do you distinguish the 'better companies' from the 'tax deals' in Hawaii when most Act 221 investments included BOTH investors receiving tax credits AND investors receiving ZERO CREDITS, investing in the SAME COMPANY at the SAME TIME? How can the SAME COMPANY be BOTH a 'better company' and (an implicitly 'bad') 'tax deal' at the SAME TIME? Hypothetically, how does the existence of 'tax deals' discourage investment in "non-tax deals" by nonprofit pension funds, endowments and trusts, for whom tax credits are irrelevant and have no impact, either positive or negative? Logically, how would tax credit investors investing in lousy deals in any way affect or prevent tax exempt investors from investing in completely unrealated 'better company' nontax deals? Is there any empirical evidence to show that these nonprofit institutional investors are in fact so philosphically opposed to the preferential tax treatment of Act 221, and if they are, why don't they give up their own tax exempt status? What has a greater negative impact on Hawaii tax revenues--Act 221, or the tax exempt status of

pension funds, endowments and trusts? Should the same cost-benefit analysis and metrics be applied to both?"

[100] Phone interview between Jeffrey Au, Managing Director, PacifiCap Group, LLC, and Dr. Marcia Sakai, September 28, 2006.

[101] Information provided to the authors by the Department of Taxation. See also Table 1 of this report.

[102] The actual total amount of credits claimed is $ .393633 million. Accordingly, the authors of this report rounded the number .3 million to .4 million. See also Table 1 of this report.

[103] Rounding error of .1 million occurs because the credits claimed figure for each tax year are first rounded and then added together to determine total figure.

[104] According to Dr. Sakai, the $75 million claimed during this period is part of the $185.1 million amount.

[105] This information is available on the Department of Taxation's website.

[106] Computed as follows: High Technology Credit/ GRAND TOTAL for insurance underwriters or $13,057,896/ $13,518,439. See "Table 1:Dollar Amounts of Tax Credits Claimed by Type of Credit and Type of Taxpayer–2002".

[107] Computed as follows: High Technology Credit/ GRAND TOTAL for individual taxpayers or $11,191,036/ $75,178,425. See "Table 1:Dollar Amounts of Tax Credits Claimed by Type of Credit and Type of Taxpayer–2002".

[108] Computed as follows: High Technology Credit claimed by individuals in First Taxation District is $9,485,330. Total claimed by individuals is $11,191,036. $9,485,330/ $11,191,036 = 84.76%. See "Table 2: Number of Returns Claiming Selected Tax Credits by Type of Credit and by Taxation District–2002" available on the Hawaii Department of Taxation's website.

[109] Computed as follows: High Technology Credit claimed by individuals in Second Taxation District is $ 1,541,859. Total claimed by individuals is $11,191,036. $1,541,859/ $11,191,036 = 13.78%.

[110] Russo, Benjamin, "A cost-benefit analysis of R&D tax incentives," Canadian Journal of Economics Vol. 37 No. 2 (May, 2004), p. 320.

[111] Zee, et al. (2002), p.1508.

[112] The benefit-cost ratios presented are the result of calculations, using a scenario approach. The use of scenarios arises from the absence of information from which to build a reasonable model of the venture capital market, both supply of funds as well as the demand for funds, in Hawaii. As such, there is no explicit calculation of the change in net welfare.

[113] "Tech credit's value lost in flawed analysis," commentary by Mike Fitzgerald, President of Enterprise Honolulu, and Bill Spencer, President of Hawai'i Venture Capital Association, the Honolulu Advertiser (October 15, 2006).
Fitzgerald, et al. (2006), pp. B1,B3.

[114] After the Draft Report was submitted, the authors were informed by Mr. Donald Roussling, Tax Research and Planning of the Department of Taxation, that the jobs count reported in Tables 2 and 3 do not necessarily measure the same thing. Data reported in these tables are derived from N317s submitted by QHTBs in Tax Year 2002 and Tax Year 2003. The N317, or equivalent form, was modified in 2003 to ask

for data regarding jobs created since inception, while the form for 2002 asked for data regarding anticipated job creation. We had initially calculated the point elasticity for jobs created by QHTBs in response to changes in investment to be 0.21, on the basis that data from both years were comparable. However, since this does not now appear to be case, we draw no inferences from the above .21 point elasticity statistic.

[115] Ann Chung is Vice President Government and Community Relations for the Hawaii Science & Technology Council.

[116] "Tech sector tiny but teeming," by Sean Hao (February 20,2006), the Honolulu Advertiser, posted on the website http://the.honoluluadvertiser.com .

[117] Id.

[118] Fitzgerald et al. (2006).

[119] See the Table 9 "Technology Sector Job Counts and Wages, 2001-2004." In 2004, of the 13,106 total technology jobs reported by the DBEDT, only 334 related to the category "Technology Manufacturing."

[120] In an opinion piece in the Honolulu Advertiser, spokespersons for the Hawaii high technology industry claimed that for 2002 and 2003 more than 4,000 jobs were created according to Department of Taxation data. When calculating "technology jobs", the spokespersons for the technology industry counted "performing arts products" jobs as "technology" jobs. Fitzgerald et al. (2006).

[121] The DBEDT data classify "technology" jobs by using the widely-accepted NAICS system.

[122] It should also be noted that some of the "net" technology jobs collected by the DBEDT are not jobs for which an Act 221 credit is claimed. Some of the "gross" jobs reported by the Department of Taxation are susceptible to "double counting".

[123] See "High Tech: A Product, A Process, or Both?," In Context: The Indiana Economy, Vol 1, Issue 6 (June, 2000).

[124] See section of Final Report entitled "Department of Taxation's Act 221 Audit Rate".

[125] For example, according to the Honolulu Advertiser, "Hoku Scientific, a Kapolei-based fuel cell technology company, has added about 15 jobs since 2002 and has become a publicly-traded company." See "Tech sector tiny but teeming," by Sean Hao, (February 20, 2006).

[126] The Department of Taxation reported these two activities in combined form.

[127] 2001-2003 Report, The Tax Review Commission to the State of Hawaii, p. 8.

[128] $20 M in Act 221 tax credits audited by state," by Sean Hao, the Honolulu Advertiser (June 13, 2004), posted on the website http://the.honoluluadvertiser.com .

[129]Mr. Kawafuchi sometimes refers to the refundable research and development credit as the "research credit" and the non-refundable QHTB credit as the "investment tax credit". This can lead to no small amount of confusion. A business can qualify for a refundable research and development credit based upon a percentage of research and development expenditures under I.R.C. Section 41(d). In 2004, Act 215 required a business to be a QHTB to qualify for the refundable research and development credit.

"Research and development under 41(d)" is one of the "activities" through which a business can qualify as a QHTB in order to claim an Act 221 investment tax credit. Investors in a QHTB –under both Act 221 and 215—can qualify for the

nonrefundable QHTB investment tax credit. The Act 221 credit is based upon the amount invested in the QHTB.

In his comments to the authors of this report, Mr. Donald Roussling, Tax Research and Planning of the Department of Taxation, stated, "Investments in QHTBs presumably bring forth increases in the R&D credit. Is this accounted for in the tax consequence calculation?"

The authors of this report were provided with aggregated taxpayer data by the Department of Taxation for 2001, 2002, and 2003. When comparing DBEDT data with Department of Taxation data, most of the R&D-related expenditures reported for 2001-2003 did not occur through QHTBs. Moreover, using Department of Taxation data, for those QHTBs claiming the Act 221 investment tax credit, the "R&D under 41(d)" activity represented a small portion of the total activities.

An inference that can be drawn from the above data is that, for 2001-2003, most of the increase in R&D expenditures during this period is related to the availability of the refundable R&D research credit rather than to the availability of the combination of the refundable research credit and non-refundable investment tax credit.

[130] $20 M in Act 221 tax credits audited by state, by Sean Hao, the Honolulu Advertiser (June 13, 2004).

[131] In Year 2, the credit recapture amount is computed as follows: 10% ($700,000).

[132] The total "lost" Act 221 credit over these 4 years (Years 2-5) will be $1.3 million.

[133] The Department of Taxation is not sure of this number.

[134] Zee, Stotsky and Ley (2002), p 1499.

[135] For example, these forms could be put on a secured Website maintained by the Department of Taxation. The information would be entered automatically by the taxpayer. Information contained on the form contains would be transferred electronically to the Department of Taxation. Certain data fields –those not containing taxpayer identifier information-- would simultaneously be transferred to a separate secured website. This website, after being reviewed by the Department of Taxation, would be available to the public. The website would keep a running total of certain information of which, by law, the Department of Taxation is already required to track on a timely basis. The Department of Taxation would send a confirmation to the taxpayer that the information had been received.

[136] Telephone interviews with Gregory Kim, Partner, Vantage Counsel LLC and Dragonbridge Capital, September 5, 2006; John Chock, Hawaii Strategic Development Corporation, September 5, 2005; Jeffrey Au, Managing Director, Pacificap Group LLC, September 28, 2006.

[137] Ibid.

[138] Phone interview, September 28, 2006.

[139] See DBEDT website http://www.hawaii.gov/dbedt/info/economic/data_reports/technology_reporthttp://www.hawaii.gov/dbedt/info/economic/data_reports/technology_report.