HIPA
HAWAII INSTITUTE FOR PUBLIC AFFAIRS

POLICY REVIEW

A NEW ECONOMY IN HAWAI‘I

Benchmarking Hawai‘i’s Progress in The New Economy

March 2003


NOTHING HAPPENS
UNTIL SOMETHING MOVES.
—Albert Einstein

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Introduction

Some might guess that a report on the New Economy is merely about the development of high-tech industries. Some may also believe that the New Economy was a topic for a few years ago and has since become less relevant. Readers of this report will find that both of these views are misguided—as misguided as indiscriminately buying tech stocks a few years ago and as misguided as completely divesting of tech stocks today.

This report is relevant for the entire Hawai'i economy and it is utterly timely. It is intended to help readers navigate the complexities of good economic policy, wisely interpret data, and smartly assess where Hawai'i is and where it might plan to be in the future. We will attempt to steer clear of often conflicting and sometimes baseless generalizations of good or bad.

For example, in a May 2001 report, the Hawai'i State Department of Business and Economic Development and Tourism boasted that, "Hawai'i's private technology sector has grown at an impressive pace since the mid-1990s."[1] Yet, the Progressive Policy Institute's New Economy Report ranks us 46th among the 50 states in the number of high-tech jobs we've produced.[2]

In a similarly confusing set of messages, the Small Business Survival Committee ranked Hawai'i's small business climate dead last among the states[3] and Forbes Magazine saw fit to publish an article titled "Trouble in Paradise... Why doing business in Honolulu has become nearly equivalent to suicide."[4] Yet, a 2001 study of Entrepreneurial Hot Spots by MIT economists ranked us a respectable 27th among the states and listed Honolulu among the most improved areas in the country for supporting entrepreneurs.[5]

How prepared is Hawai'i for the New Economy, really? What are our economic strengths and weaknesses? How do we adapt to the forces of the New Economy? What economic policies should we adopt?

PURPOSE AND GOALS OF THIS REPORT

The purpose of this report is to help policy makers, industry leaders, entrepreneurs, and citizens sift through conflicting information and make sense of the New Economy in Hawai'i. It is designed to provide an even-handed, informative and locally relevant discussion that points to strategic action. It delves into policies and data to go beyond the clichéd talk of Hawai'i as a center for high-tech activity, the rhetorical attacks on "anti-business" Hawai'i and simple state rankings. Readers will quickly understand that this is not a report on any particular industry, but rather, it is the story of changing economic times and how strategic action can help Hawai'i achieve its societal goals.

The report has four specific goals:

1. Help the reader acquire an understanding of the New Economy in the unique context of Hawai'i.
2. Provide a set of useful, original indicators that can be used to track Hawai'i's New Economy progress and performance over time.
3. Use these indicators and review current policies to assess where we stand today.
4. Provide the foundations of a New Economy strategy for Hawai'i, including some specific recommendations for action.

We took as our starting point the State New Economy Index developed by the Progressive Policy Institute (PPI), a Washington D.C. based think tank that has done the most extensive work in this area.[6] PPI has developed a set of measures for evaluating states' New Economy performance. In 1999 and again in 2002, PPI ranked the states according to these measures and proposed steps that policy makers can take to speed progress toward the New Economy. While the measures are well suited for painting a national picture and providing most states with a sense of where they stand in the national context, they are not always the best measures for Hawai'i given our unique values, culture, and economy. The PPI report is an invaluable starting point, but the measures, findings and recommendations herein are derived from an extension and modification of their analysis.

WHAT THIS REPORT IS NOT

This report is not a Hawai'i-centric critique or retelling of PPI's New Economy reports or any other analysis. Rather, this report attempts to do for Hawai'i what the PPI reports attempt to do for the nation—produce relevant indicators, assess progress and inform policy. It is an original starting point written in Hawai'i, specifically for Hawai'i.

This report is also not designed to provide a comprehensive discussion of the causes and consequences of the New Economy in Hawai'i since many of the ideas and indicators discussed in this report—local research and development spending, venture capital investment, technology in schools, tax credits, and others—are worthy of entire studies themselves. Nor does the report provide a comprehensive review of all policies, programs, or initiatives related to the New Economy. While we do focus on certain key policies and programs, our main goal is to use examples to illustrate general concepts.

Finally, we believe the analysis is "incomplete" by necessity, for such an analysis cannot be complete until conversation and real collaborative action occur between elected and appointed policy makers, advocates, educators, academics, entrepreneurs, industry leaders, employee groups and citizens. Hawai'i's success ultimately lies in the collective knowledge, wisdom and resources of all of these groups.

OVERVIEW

This report has three substantive parts. First, we will define the term used throughout this report—the "New Economy"—and explain its five defining characteristics. These five facets of the New Economy provide a framework for our analysis and subsequent sections of the report. Second, we assess Hawai'i in each of the five areas by looking at quantitative indicators that can be used to measure New Economy progress. PPI's framework and measures proved well designed and useful, but required some modification to fit with Hawai'i's unique context. We modify PPI indicators in some cases and suggest alternatives in others, then dig behind the rankings into the data, trends, and policies to describe how Hawai'i is doing in the New Economy and what strategic moves it might make. Third, we briefly discuss major transformations that we believe must ultimately occur for Hawai'i to successfully implement a New Economy strategy.

A NOTE ABOUT ECONOMIC DEVELOPMENT

It is often assumed that economic analyses such as this one are only concerned with maximizing money. In some circles, the term "economics" is associated with greed, environmental degradation, cultural insensitivity and even social injustice. Others equate "economics" with "business." Similarly, economic development is often linked to the physical development of buildings and infrastructure.

Readers should disabuse themselves of such preconceptions. This report examines economic development as the science of utilizing the tendencies and rules of the market economy to accomplish Hawai'i's *social* goals.

Economic development starts with an understanding of our social goals, clearly articulated by our leaders and endorsed by our citizens. Such goals might include quality healthcare for all, strong families, a healthy environment, social equality, promotion and preservation of culture, high paying jobs, or an educated population. We must accept that the pursuit of one goal may work to the disadvantage of another, so actions must be carefully considered in the broad context of all goals. Social goals are the ultimate goals of economic development.

Good Economic Development

1. Know our social goals
2. Wisely choose economic tools to achieve those goals
3. Goals and tactics should be part of a comprehensive economic strategy

Next, sound economic development requires an understanding of the economic tools at our disposal to pursue our social aims. Throughout history, societies have manipulated their economies by using a common set of tools: creating tax incentives to encourage certain actions, redistributing wealth through taxation, constraining individuals through property laws, providing direct subsidies to individuals or industries, removing government regulation in some areas or increasing it in others. Each intervention carries with it certain costs and benefits. For example, regulation may prevent pollution, but it may also saddle businesses with additional expenses, resulting in a loss of jobs. Good economic policy is made with a clear understanding of these costs and benefits, and of the social goals being pursued in each instance.

But individual goals and tools are not enough. We also need a comprehensive strategy to achieve those goals—an overarching vision and approach to economic development that forms the best combination of costs and benefits. Our strategy should reflect our theory of economic change and our values—two considerations that go beyond selection of specific goals or tools. The strategy requires strong leadership to help us articulate our aims, make the best decisions, and implement policies as planned.

Executive Summary

This report is a tool for creating economic policy in Hawai'i

Its purpose is to define and describe the New Economy, set forth an original set of useful indicators for Hawai'i, assess how we are doing and make general recommendations based on economic development principles. The report is not a critique or retelling of the Progressive Policy Institute's New Economy reports or any other previous analysis. Rather, it is an original study for discussion written in Hawai'i, specifically for the achievement of Hawai'i's social goals.

The New Economy is here no matter what we do

We cannot deny the economic changes of modern times. We can only either adapt to them or succumb to them. Changes in how people conduct business, learn, work, innovate, communicate and compete can erode our existing economy if we fail to create a New Economy strategy.

The New Economy is not merely about high-tech industries

Every facet of our existing economy—tourism, agriculture, government services, non-profit organizations—everything is engulfed in the New Economy. There are **five** critical New Economy areas. All deserve equal attention of policymakers: 1) Developing high-tech products and services; 2) Infusing all industries—public and private—with technology; 3) Developing a new concept of work; 4) Establishing a culture of innovation and entrepreneurship; and 5) Achieving global competence and connectedness.

Assessing the New Economy requires good indicators

Good indicators are not available for all the New Economy areas we care about. In this report, we seek the *best available* indicators that are most 1) closely tied to our desired economic outcomes, 2) statistically sound, 3) easily and inexpensively accessible, 4) replicable, 5) able to be benchmarked and 6) relevant to Hawai'i's unique economy.

Hawai'i lags behind the rest of the nation in development of high-tech firms and industries, but there are recent signs of improvement

- Within the past few years, Hawai'i has taken major steps to encourage the development of high-tech industries and has successfully focused public attention on the role of high-tech industries in economic development.
- The number of locally produced scientists and engineers—the drivers of high-tech development—has dwindled over the past ten years.
- The keys to improving our performance in tech-sector development appear to lie in the other four New Economy areas where Hawai'i has not been able to focus attention, ideas and resources.

Hawai'i lags behind other states in the extent to which its government and industries are technologically infused

- Unlike the promotion of high-tech industries, the adoption and use of technology across all sectors—including non-tech businesses, government and nonprofits—has not been a policy focus.
- In spite of progress in using the Internet to improve government services, some areas of web-related service still require improvement.
- The lack of technological capacity in the nonprofit sector requires special attention.
- Hawai'i has the building blocks necessary to promote technology infusion in its government and industries.

Hawai‘i has a workforce that appears, in some respects, well prepared, but we have failed to create the New Economy jobs and opportunities to capitalize on this valuable asset

- We lack the appropriate data to effectively gauge whether Hawai‘i’s workforce is well prepared to function in the New Economy.
- Our economy is laden with old economy jobs.
- We are failing to bring technology into our schools and use it to prepare our students for the New Economy.
- A disparity of outcomes between private and public schools bodes poorly on closing gaps in opportunity and ensuring that all Hawai‘i students are prepared to thrive in a New Economy.

Hawai‘i has significant entrepreneurial energy and assets, but needs better supports for and investment in innovative firms and non-tech ideas

- We have a substantial and increasing number of successful entrepreneurs and young, growing businesses.
- Investment in research and development—the fuel of New Economy innovation—is limited, particularly in the private sector.
- Our policies focus on the development of new high-tech firms and not on creating a supportive environment for entrepreneurs generally.
- Access to capital for young and growing companies may be a limiting factor in entrepreneurial development.
- The University of Hawai‘i is beginning to assume a significant role in promoting innovation in Hawai‘i’s economy.

Hawai‘i has well-known assets to build a strong position in a global economy, but we have not yet become a global state

- We are not collecting the appropriate data to effectively measure Hawai‘i’s participation in the global economy.
- We are making progress toward diversifying our export market.
- Our visitor industry is not successfully tapping a diverse set of global markets.

The economy will not transform unless institutions transform

The New Economy needs new thinking. No set of recommendations contained in this report will alone bring about the New Economy framework that Hawai‘i needs. Many of the economic policy tools and rhetoric that we have grown accustomed to are no longer effective or wise. Quality of life indicators, government operation, universities, schools, unions, businesses, social services and our collective culture will be tested before we can thrive in the environs of the New Economy.

Summary of New Economy Indicators

	Indicator (Key Indicators Shaded)	Compare To	Hawai'i Score	U.S. Score	Hawai'i Rank	Hawai'i Status
High-Tech Products and Services	High-tech jobs	States, U.S. & trend over time	1.9%	4.2%	46	Poor
	Scientists and engineers	States, U.S. & trend over time	0.50%	0.49%	18	Fair
	Utilization of high-tech tax incentives	Trend over time	N/A	--	--	Too soon to tell
Technologically Infused Industries	IT jobs in non-IT industries	States, U.S. & trend over time	1.1%	1.7%	37	Poor
	Digital government	States	See chart	See chart	38	Mixed
	Commercial domain names	States, U.S. & trend over time	1.16	0.95	8	Good
	Online population	States, U.S. & trend over time	50.9%	53.9%	40	Poor
	Broadband access	U.S. & trend over time	3.26	3.00	--	Fair
New Kinds of Work	Educational attainment of the workforce	States, U.S. & trend over time	52.2	51.2	17	Fair
	Managerial, professional and technical jobs	States, U.S. & trend over time	23.4%	25.8%	41	Poor
	Technology in schools	States	See chart	See chart	45	Poor
Innovative and Entrepreneurial Culture	Successful startups	States & trend over time	See chart	See chart	27	Fair
	Patents	States, U.S. & trend over time	0.13	0.60	50	Poor
	Industry investment in R&D	States & trend over time	0.04%	1.69%	49	Poor
	Govt/nonprofit investment in R&D	States & trend over time	0.40%	0.38%	10	Good
	Venture capital	States & trend over time	0.28%	1.47%	41	Poor
	Gazelle jobs	Trend over time	8.5%	--	--	Mixed
Global Competence and Connectivity	Export focus of manufacturing	Trend over time	$24,848	--	--	Fair
	Foreign business travel	Trend over time	1.46%	--	--	Fair
	Diversification of manufacturing foreign export market	Trend over time	0.19	--	--	Good
	Diversification of visitor market	Trend over time	0.61	--	--	Poor

The New Economy

What words come to mind when talking about the New Economy? High-tech industries, venture capital, e-commerce, information economy—all are terms common in articles and reports on modern economic development. But these only tell part of the story of a changing business climate sweeping the nation. PPI describes the New Economy this way:

> This New Economy is a knowledge- and idea-based economy where the key to higher standards of living and job creation is the extent to which innovative ideas and technologies are embedded in services, products, and manufacturing processes. It is an economy where risk, uncertainty, and constant change are the rule, rather than the exception. It is an economy where hierarchical organizations are being replaced by networked learning organizations.
>
> But most importantly the New Economy is a progressive force for increased productivity and higher incomes, more knowledge-based jobs, greater dignity and autonomy for working Americans, an expanded number of stakeholders, and greater access to information by citizens.[7]

Key to understanding the New Economy is to realize that high-tech industries alone are not enough. Rather, it requires us to abandon commonly held notions about economic development.

THE NEW ECONOMY AFFECTS DIFFERENT PLACES IN DIFFERENT WAYS

It is difficult for some to refrain from saying that Hawai'i should be like Silicon Valley or North Carolina's Research Triangle or Ireland or Singapore or Malaysia. There are valuable lessons to be learned from all of these places, but it is highly unlikely that we will or would want to replicate any of those economies in Hawai'i. Hawai'i needs to look toward the New Economy in a way that is right for our time, place and people.

The New Economy has no meaning without context. Just as the old economy meant different things to different states—steel and manufacturing in the Rust Belt, financial services in New England, agriculture in the Plains, tourism in Hawai'i—a New Economy for the United States will also take on many forms. Later in this report, we will identify good indicators by looking at some of the important features of Hawai'i's context.

WHAT "NEW" THINGS DO WE HAVE TO UNDERSTAND?

While Hawai'i's New Economy should be uniquely reflective of Hawai'i's situation, we must also realize that there are forces outside our direct control that are new in every sense of the word. The world and its people are rapidly changing and with that come changes to economic rules and tools. State economies that can best adapt within their own unique environment will be in the best position to achieve their social goals.

The following are various ways to think about these changing economic forces that are demanding new economic strategies. The forces described are interrelated and overlapping.

Changes in communication and information technology: Everyone is aware of dramatic advances in our ability to store, analyze and share information. It is also critical to understand the subsequent implications for the market economy. Consumers have more information at their fingertips and are able to shop for best values across vast geographic distances. At the same time, sellers can collect better information on consumers to maintain customer loyalty, to target specific customer segments or to develop new products to serve emerging demands. As the volume of information grows far beyond the capacities of our human brains, a premium is placed on information storage, organization, and management.

Changes in consumer preferences and behavior: It has always been true that tastes change and that people seek new experiences and products. But today, the pace of changing tastes and the forces that influence those changes cannot be ignored. We live in a time of mass communication and mass culture, which force goods and services in and out of fashion very rapidly. What's more, companies are increasingly adept at singling out specific market segments, then advertising and producing to their specific needs. The shelf life of market studies and opinion surveys has decreased and sellers need to be flexible and dynamic. Consumer behavior has also changed significantly. Bulk purchasing, anonymous shopping, online browsing, trying before buying, and immediate satisfaction are characteristic of new buying behavior. And, as the general standard of living rises in our country, people will buy more and different things and dispose of them quicker and with less remorse.

Changes in production technology: Producers of goods and experiences are utilizing new technologies to create them more efficiently. This is true on assembly lines where robotics help workers produce more products and it is also true in sales where a cashier uses a database to instantly serve customers. Technology gives all sectors the ability to produce, modify, customize, troubleshoot and replace more efficiently and more quickly than ever.

Changes in competition: Competition in the New Economy is broader and fiercer. With more people more actively participating in buying and selling, small technological advantages can determine success and failure. Competitors can copy products and methods faster. Consumers are no longer geographically bound. Dynamism and adaptability are key attributes of success and result in more "churning"—businesses come and go and employees jump from place to place.

Changes in global markets: The economy is more global for at least three reasons. First, new technologies for transacting business have lessened the importance of geographic distance. Second, some political barriers have been lowered, leading to unprecedented global trade. Third, new countries with emerging economies are bringing their natural and human resources into the world economy. As a consequence, many companies cannot afford to view themselves as operating in a local market. The market for products, services, land and labor is now global, creating new opportunities and threats for firms and states.

Changes in worker expectations: People want and need higher paying jobs to maintain a higher quality of life. Beyond high wages, they also want quality of life in work such as family friendly human resource policies, flexible work hours, generous and portable benefits and pleasant surroundings. A highly mobile, informed and entrepreneurial worker pool is more capable of abandoning poor working environments. At the same time, workers who lack the skills needed in the New Economy find it progressively harder to earn a living wage. The distance between rich and poor can grow very rapidly in the New Economy.

Changes in the pace of technological advancement: Obviously, new technologies have important impacts on the economy. But it is also important to recognize that technology is advancing at an unprecedented pace. The lifespan of many new ideas—from conception to testing to patent to market to obsolescence—has become incredibly short. The hope of coming up with a product, service or skill and reaping its benefits for a human lifetime is old economy thinking.

THINKING IN A "NEW" WAY

All these seemingly irreversible forces compel modern economies to find new ways to think about all aspects of society—new ways to think about how we buy things, how we sell things, how we work, how we prepare for work, how we view our quality of life, how we view communities, how we implement new ideas, and most important for this report, how we create economic policy. PPI explains the ineffectiveness of the old paradigm and the need for new thinking in this way:

> Our economic policy framework has not caught up with these new realities. Neo-Keynesians continue to believe that government's main job in promoting economic growth is to expand government spending of all kinds to spur consumer demand. Supply-siders believe that sizable tax cuts—particularly for upper- income Americans and businesses—combined with regulatory relief and the removal of other corporate responsibilities will stimulate investment and growth. And, reflecting the experiences of the post-WWII era, both consider managing the business cycle, as opposed to boosting long-term growth, as the key economic task of government.
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> In contrast, there is a growing recognition among economists that government policies can boost long-term income growth and that the impetus for growth in the New Economy comes from increasing the knowledge base of the economy, including research and education and skills, and fostering technological innovation.[8]

FIVE CHARACTERISTICS OF THE NEW ECONOMY

Based on the changes in the modern world, we have selected five defining characteristics of the New Economy. These five features provide a framework for analysis of Hawai'i's New Economy and for forming a unique strategy suited to Hawai'i's context.

The five characteristics we identify here are different from the five categories used by PPI. While the PPI categories do a good job of describing the changes in the New Economy, the five characteristics outlined below were chosen as a clear and complete means of organizing desired outcomes, overall strategy, indicators and recommendations. These five areas simply cannot be ignored. They collectively capture all the elements of the New Economy.

High-tech products and services

The first defining feature of the New Economy is the emergence of industries and firms that produce the technology driving change in all parts of the economy. These companies—the producers of computer hardware and software, biological innovations, electronic devices, network installers, database engineers, and others—are forcing all companies to rethink the way they do business. The industries that produce these goods and services are an important source of growth for state economies, and offer the kinds of well-paying, highly skilled jobs that sustain a high quality of life. Toward this end, states are assessing their competitive assets and determining how to build and sustain high-tech industries.

Simply growing high-tech industries will not make a state capable of surviving in the New Economy

High-tech products and services are an unmistakable characteristic of the New Economy, but too much focus on this characteristic can lead to failure. Furthermore, failure to address the other New Economy characteristics will hinder the development of high-tech industries.

Technologically infused industries

High-tech products and services are only one part of the New Economy story. An equally important feature is the infusion of new technology into all industries and sectors—old economy and new. This can take the form of new agricultural techniques, a computerized reservation system at a hotel, or wireless communications in a taxi.

Technological infusion is not only needed in private industry. All sectors, including government, education, labor, and social services, can help the economy by utilizing new technology. Scarce resources are more efficiently used and human resources are better utilized when appropriate technology is in place. This happens when a social service agency effectively uses e-mail, a county permitting process becomes available online, a school uses a student database, or a neighbor island health clinic employs telemedicine.

By infusing technology into its industries, society can become more efficient, more economically competitive, and more effective at improving quality of life

By infusing technology into its industries, society can become more efficient, more economically competitive, and more effective at improving quality of life. States that prosper in the New Economy will keep abreast of technological advances, infuse new technology into systems, and create mechanisms for adaptation and upgrading.

Technological infusion also demands leaders who can envision ways to enhance performance of their company, nonprofit organization, or government agency with new applications of technology—leaders who can see how a new automated system might reduce costs, or how a new software application might improve customer relations. Widespread technological infusion also requires leaders that can deal with the rapid pace of technological change and the resulting business challenges and opportunities.

New kinds of work

Politicians often state their support for "working people" and this conjures images of people in factories, restaurants and farms. But what will characterize the jobs and job training of most working people in a New Economy where people have a universal expectation for an ever-growing standard of living and where demand for low skilled labor continually shrinks?

The New Economy will call for more jobs that require high levels of skill and education, that pay higher wages, and that involve regular interaction with technology

While there will always be a diversity of jobs, the New Economy will call for more jobs that require high levels of skill and education, that pay higher wages, and that involve regular interaction with technology. In-demand New Economy workers will migrate toward employment that lends itself to a high quality of life, has greater flexibility, and provides opportunities for continued learning and mobility. As industries churn and labor market transaction costs decrease, the thought of lifetime employment will fade. People will change jobs more frequently putting a premium on the portability of benefits and skills. Employers too will change their practices to meet these demands.

Preparing these workers will also change. The basic competencies of traditional public education will no longer be enough to adequately prepare people for work. While literacy and facility with numbers will continue to be fundamental, new skills such as communication, foreign languages, computer literacy, information technology and entrepreneurship might become core competencies. Schools will have to change their ways, but we will also need to train people in non-school settings to keep up with ever changing knowledge and technology. We must also find ways to help the existing, out-of-school workforce participate in the New Economy.

Innovative and entrepreneurial culture

Successful states in the New Economy will create systems that encourage innovation and entrepreneurship

With so much information at our fingertips, more people are capable of contributing to the marketplace of ideas, goods and services than at any time in history. This new reality has turned us into a "knowledge economy" where the capacity to turn new ideas into reality is the cornerstone of continued economic success. As a consequence, innovation and entrepreneurship are requirements for New Economy survival. Successful states in the New Economy will create systems that encourage innovation and entrepreneurship.

More than just entrepreneurial high-tech businesses, the New Economy is about a culture of innovation and entrepreneurship that permeates all sectors of society. Entrepreneurship must flourish in non-tech sectors from restaurants to financial services to agriculture. Corporations must find ways to encourage and enhance new initiatives. Employers must create environments where their employees can innovate, own their successes, and participate more fully in growing the business. In the public sector, too, social entrepreneurs must create new ways to improve government agencies, nonprofits, schools, unions, and communities. In the New Economy, there is no shortage of venues for enterprising people.

Global competence and connectivity

Globalization is as exciting to some as it is alarming to others. It is exciting to think of the great social benefits for an economy that can successfully sell its products and services to a world full of potential customers. It is also exciting to think of the benefits of shared culture, knowledge, and technology when nations cooperate and transact business. However, there is also legitimate cause for concern since being uncompetitive in a global arena can leave an economy much worse off than it was prior to global exposure. Globalization can also contribute to environmental degradation, problems in labor relations and the commercialization of world cultures.

Successful New Economies will have great competence in the languages, cultures, histories and economies of different people

In order to succeed and meet globalization on its own terms, states must build global competence and connectivity. Understanding the global market requires investigation of the preferences and needs of different nations. Successful New Economies will have great competence in the languages, cultures, histories and economies of different people. Consider Hawai'i's tourist industry and its proclivity toward the Japanese market and then imagine that level of competence for many more nations in many more industries held by many more Hawai'i citizens. Besides this understanding, there must also be the actual connections to these markets—both the technological capacity and the human capital to access other governments, businesses and consumers.

Hawai‘i’s New Economy Status

Some claim that Hawai‘i is heading directly to success in the New Economy. These claims are overblown. Others lambaste current economic policy as weak and uninspired. This sentiment is also misguided. The facts, data and economic theory tell a more complex tale.

NEW ECONOMY INDICATORS FOR HAWAI‘I

Statistics and rankings are often used loosely when trying to make a point. They have supported claims that Hawai‘i is doing poorly (a recent op-ed piece cites the 1999 PPI Report as a sign of poor performance)[9] or doing well (Former Governor Cayetano cited the same report as indicating Hawai‘i’s success).[10] How should Hawai‘i make sense of all the numbers used to describe our progress toward a New Economy?

Best Indicators

- Measure *outcomes* you care about rather than just inputs and outputs
- Statistically sound
- Data collection is easy, inexpensive, and done regularly
- Replicable
- Lend themselves to benchmarking
- Specifically relevant to Hawai‘i

One must begin with good indicators. The best indicators are statistically sound and they answer the questions we care about. Ideally, data for indicators can be collected easily, inexpensively, and over time at fairly regular intervals. A good indicator will also lend itself to benchmarking, either against our historical performance, against the national average, or against the performance of other states. Sometimes, data are simply unavailable to answer the right questions so proxies are used to gauge progress. Together a good set of indicators tells a coherent story about the economy—a story that can guide us toward informed action.

We took as our starting point the indicators developed by PPI in its State New Economy Index. PPI provides sound New Economy concepts and reasoning. But these indicators and rankings need to be understood in context to be truly useful. Hawai‘i’s economic context is unique for many reasons that complicate direct numerical comparisons with other states or with the country as a whole. For example:

- Hawai'i has a small and isolated population that limits market scale, competition and expansion in many industries.
- Hawai'i's geographic location adds costs and limitations to transported goods and sometimes creates barriers to market entry.
- Hawai'i has a uniquely undiversified and heavily service oriented economy supplied by high concentrations of low-wage workers and susceptible to dramatic ups and downs.
- Hawai'i's culture is unique. It includes a strong affinity to place and family ties that can lead to intentional economic immobility, highly peer-influenced consumer choice and reliance on social capital.
- Hawai'i's industries are grounded in a unique economic and political history. For example, the prominent role of organized labor, the rights of indigenous peoples, and our experience with speculative foreign investments continue to shape our approach to economic development.
- When the most recent available data were collected, Hawai'i was still emerging from the longest economic slump in its history while the mainland U.S. was finishing a period of unprecedented, sustained economic growth. As a result, comparisons between Hawai'i and the U.S. are dubious for certain indicators.

In many cases, we modified the PPI indicators primarily because they were not specifically relevant to Hawai'i's unique circumstances, or because PPI's statistical methodologies were not easily replicable to allow for monitoring of trends over time. Where warranted, we disregarded some PPI indicators and added new indicators to form a set custom-tailored for Hawai'i. This set can certainly be expanded and improved as new data is collected or made available. Readers should not think that these are the only indicators Hawai'i should be looking at. (Those interested in how these indicators compare with PPI's work should refer to the Technical Appendix).

We describe each indicator as a tool to gauge New Economy performance in the five key areas of New Economy development. For ease of use, we classified indicators into two categories depending on their utility for Hawai'i:

Key Indicators: These are the measures that best reflect what we actually and ultimately care about. Improvements in these indicators should mean progress in the New Economy. These measures still may not be ideal—where appropriate data were lacking we had to settle for the best *available* measures. This is particularly true of two indicators: Educational Attainment of the Workforce and Export Focus of Manufacturing. What the key indicators represent is a short list of measures that most accurately reflect Hawai'i's New Economy performance.

Useful Indicators: Improvements in these indicators are *probably* good signs. But mere attempts to improve these indicators may or may not result in intended outcomes. Many of these indicators measure important inputs and outputs in Hawai'i's New Economy (e.g., the number of patents, or the number of commercial domain names), but do not measure the results we are ultimately aiming for (e.g., high wage, high skill, professional jobs, or competitive high-tech firms). Overemphasis on changing these indicators would be like "teaching to a test" rather than aiming for real learning. For example, we could create a Hawai'i patent assistance office to increase the number of patents awarded in Hawai'i, but this alone would not be cause for celebration until we are advancing the real goal of creating new high wage jobs and becoming an innovative society.

Hawai'i's New Economy Indicators

Note that these are not the only indicators that should concern Hawai'i. More can and should be added assuming data is reliable and available.

	Key Indicators	Useful Indicators
High-Tech Products and Services	↓ High-tech jobs	↔Scientists and engineers ? Utilization of high-tech tax incentives
Technologically Infused Industries	↓ IT jobs in non-IT industries	↔Digital government ↑ Commercial domain names ↓ Online population ↔Broadband access
New Kinds of Work	↔Educational attainment of the workforce ↓ Managerial, professional and technical jobs	↓ Technology in schools
Innovative and Entrepreneurial Culture	↔Successful startups	↓ Patents ↓ Industry investment in R&D ↑ Govt/nonprofit investment in R&D ↓ Venture capital ↔Gazelle jobs
Global Competence and Connectivity	↔Export focus of manufacturing	↔Foreign business travel ↑ Diversification of manufacturing foreign export market ↓ Diversification of visitor market

KEY:
↑ Hawai'i doing well against benchmark
↓ Hawai'i doing poorly against benchmark
↔Hawai'i about average against benchmark or results are mixed
? Too early to tell

When considered together, the numbers suggest that we have good New Economy assets to build upon: an educated workforce, exposure to global markets, a growing number of successful entrepreneurs, and a fairly good technological infrastructure. Yet, the indicators also suggest that we have not invested appropriately to turn these assets into New Economy companies and jobs. We have focused our recent energies on building high-tech industries in Hawai'i. This in itself is an accomplishment. However, this narrow focus may also be diverting attention from other important areas of the New Economy.

The policy picture that emerges is also mixed. We have some highly progressive New Economy policies in place. For example, we are encouraging the growth of our high-tech industries through some of the most progressive tax incentives in the country. Yet, we are lacking policy initiatives in other areas. For instance, we have made minimal public investment in infusing our industries with technology. An effective New Economy strategy will require us to fill the policy gaps, and to do so with a clear vision of the larger New Economy context painted by the indicators.

Determining the next steps is no easy task. It is not simply a matter of looking at indicators and making the numbers improve. Rather, new steps must be based on a clear understanding of our economic and social goals, New Economy principles, and our relative strengths and weaknesses.

To help clarify what New Economy thinking means, we will discuss examples of old economic tools that have been applied to New Economy goals. While these old tools may not all be bad, the main focus of public policy should be based on the new tools. For example, given Hawai'i's experience marketing itself as a tourist destination, it should have no problem "branding" itself as a place to do high-tech business. But marketing alone will not be enough in the highly competitive New Economy where companies and workers can discover the true extent of a high-tech infrastructure and a high quality of life.

As we look ahead to next steps, three fundamental points must be made:

1. Hawai'i lacks clear objectives to drive New Economy progress

Clear objectives lie at the heart of good economic development planning. A good objective is measurable, specific, achievable, and allows relevant stakeholders to envision how they might contribute to reaching it. For instance, "Hawai'i will create 50 new high-tech firms per year for the next five years." This objective helps everyone—entrepreneurs, industry leaders, policy makers, bureaucrats, and consumers—recognize how their actions and efforts contribute to a larger vision for a New Economy in Hawai'i. In virtually every theme area, we found such objectives lacking.

Crafting good objectives requires consideration of the state of the New Economy and the forces affecting it. For example, it may be unrealistic to set a goal of attracting levels of venture capital invested elsewhere during the 1990s. Conditions in the capital markets have changed radically within just the past five years. Our objectives should also consider our unique cultural and historical context. For example, external shocks like the Asian financial crisis and September 11th have taught us that diversification of our economy beyond dependence upon any one industry is essential to our economic survival.

2. Many New Economy policies are still untested

The New Economy is, of course, new, and so are the policies designed to encourage its emergence. There are very few specific lessons about which policies work and which don't, either from other states' experience or our own. We know some general things

like a world-class university plays a vital role in creating a vibrant New Economy, and that a well-trained workforce is more important than tax breaks. Still, these insights beg more specific questions like how one creates a world-class university or how one creates a highly skilled workforce in the face of educational disparities. The web of policies related to the New Economy is thus highly complex and includes everything from teacher training to tax incentives, from government procurement to small business development.

There are few established rules and few proven best practices. Good policy making in a New Economy requires three things: first, understanding the context and knowing what the indicators are saying; second, aligning policies with each other as part of an overall strategy; third, and most important, innovating. The entrepreneurial spirit of the New Economy is not just for the private sector. Government and the nonprofit sector must also consider creative ways to approach public issues. As any entrepreneur, these public entities should research ideas, carefully gauge risk and reward, set realistic goals, formulate a plan, and continually evaluate and redirect their energies as needed. In the recommendation sections for each of the five New Economy characteristics, we include ideas for innovative policymakers to consider and perhaps try.

3. Listen, learn and lead

The recommendations that follow are suggestions and ideas to explore. Even more important than these are three L's for Hawai'i's leaders. They must **listen** to businesses, employees, citizens, funders, entrepreneurs, and experts. They must **learn**—every policy maker should have competence in economic development if Hawai'i is to achieve its social goals. They must **lead**—leadership must be consistent, inspired, charismatic, intelligent and honorable.

Hawai'i's New Economy Outlook

	Where Hawai'i Stands	The Upside	The Downside
High-Tech Products and Services	Behind the rest of the nation	• Impressive recent steps to encourage and assist high-tech business formation • Focused attention by policy makers and stakeholders	• Dwindling numbers of locally produced scientists and engineers • Weak foundation in four other New Economy areas that support high-tech growth
Technologically Infused Industries	Behind the rest of the nation	• Technology infrastructure renovation tax credit • Some progress in government services on Internet • Some evidence of e-commerce potential	• Not enough attention on the importance of tech infusion • Key government services not slated for digitization • Poor capacity in nonprofit sector
New Kinds of Work	Overabundance of old economy indicators and old economy jobs	• Fairly high educational attainment	• Lack data to gauge New Economy preparedness • Lack of New Economy jobs • Not enough technological proficiency and use of technology among educators • Large private/public school disparities
Innovative and Entrepreneurial Culture	Entrepreneurial, but need more supports	• Increasing numbers of successful entrepreneurs • Tax exclusion for patent and other knowledge-based income • R&D tax incentives • University establishing stronger role in the state economy	• Limited investment in R&D in the private sector • Lack of support particularly for non-tech entrepreneurs • Lack of access to capital
Global Competence and Connectivity	Many assets, but still not reaching our global potential	• Strong location, cultural and language assets • Some progress toward diversifying export market	• Lack of adequate measures for monitoring progress • Travel industry is not tapping diverse global markets

Hawai'i's New Economy Toolbox

Old ideas to accomplish new goals are still old ideas. While the old economic development methods are not necessarily ineffective, most public effort and resources should be dedicated to the new tools. It is all too easy to use old tactics for a "high-tech" purpose and to mistakenly call it a New Economy strategy.

	Old Views	New Views
 High-Tech Products and Services	• "Smokestack chasing"—subsidizing companies to relocate to Hawai'i • Focus on old mainstay industries like construction and tourism to create jobs • Merely marketing Hawai'i as a high-tech place • Building high-tech facilities and hoping for occupants	• Carefully monitor outcomes of high-tech investment incentives and supports • Focusing on workforce upgrading, technological infrastructure and quality of life factors • Government collaboration with funding sources, technical assistance, and entrepreneurs
 Technologically Infused Industries	• View many industries as inherently low-tech • Helping businesses market their products • Social services viewed as "charities", not as an industry	• Encouraging technology utilization in all industries • Increasing technological capacity of government and nonprofits • Building technological infrastructure and helping businesses upgrade
 New Kinds of Work	• K-12 education • Training for a specific job/one lifetime career • Marketing to entice or paying people to stay • Focusing on job quantity/lack of unemployment	• Lifetime learning • Learning how to learn and adapt • Boosting quality of life • Focusing on job quality/increasing personal income
Innovative and Entrepreneurial Culture	• Government as a gatekeeper for new business • University as researcher • Laissez faire government/total deregulation	• Government as a facilitator of innovation • University as an economic driver • Market analysis assistance to entrepreneurs • Simple, web-based business startup processes
 Global Competence and Connectivity	• Focus on mainstay markets like Japan • Promoting specific products • Government-led trade missions	• Globally competent businesses and citizens • Truly global marketing, research and product design • Comprehension of and influence in global affairs

High-Tech Products and Services

Recent legislation has hurled Hawai'i in the right direction. It is too soon to see ultimate intended outcomes, but we should continue to monitor progress, build collaborations, set clear goals and pay more attention to the four other facets of the New Economy.

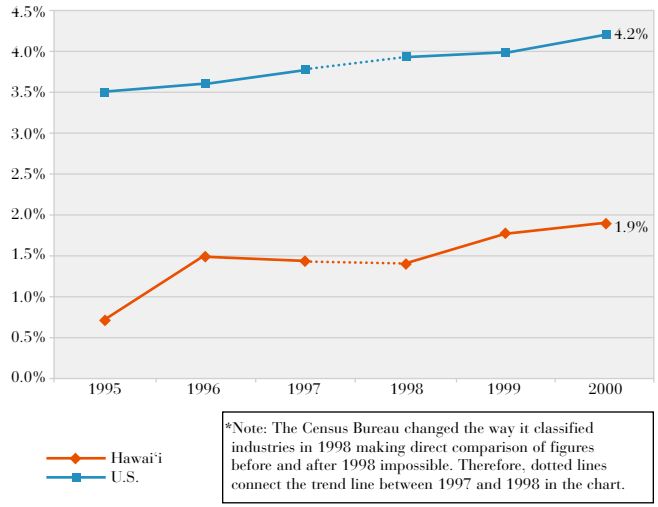
Indicators

High-Tech Jobs

Jobs in selected high-tech industries as a share of total employment

Source: U.S. Census Bureau, County Business Patterns, 1994 to 2001.

Hawai'i Rank #46



*Note: The Census Bureau changed the way it classified industries in 1998 making direct comparison of figures before and after 1998 impossible. Therefore, dotted lines connect the trend line between 1997 and 1998 in the chart.

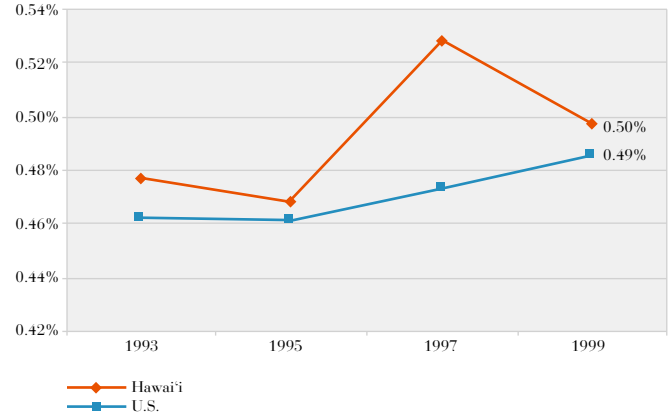
The percentage of high-tech jobs is a clear and easily measurable indicator of our progress toward building the industries that drive movement toward a New Economy. Jobs in high-tech industries tend to be well-paying positions that build skills, knowledge and technological capacity within the workforce. Although our ranking among the states and comparison to the national average are somewhat instructive in this area, it is probably more useful to compare current figures to historical data and track our creation of high-tech jobs over time. The selection of which industries are "high-tech" must also be reviewed regularly as new, technology-producing industries continue to emerge. For this measure we have included jobs in electronics manufacturing, software and computer-related services, telecommunications, and biomedical industries.

Scientists and Engineers

Civilian scientists and engineers as a percentage of the total workforce

Source: National Science Foundation, Science & Engineering Profiles, 1998 to 2001.

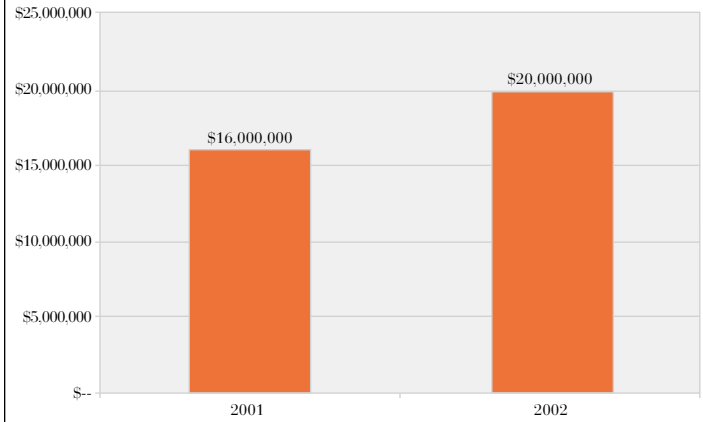
Hawai'i Rank #18



Utilization of High-Tech Tax Incentive

Utilization of the Hawai'i High-Tech Tax Incentive Program (resulting investment in Qualified High-Tech Businesses)

Source: Estimated by John Chock, Hawai'i Strategic Development Corporation.[11]



The creation of high-tech products, services, and industries requires a pool of highly skilled scientists and engineers. These workers enhance the innovative capacity of firms, fostering the development of high-tech businesses and encouraging the proliferation of innovation across all industries. The percentage of scientists and engineers in the workforce is thus an indicator of the high-tech potential of a state economy. While tracking Hawai'i's national ranking and comparing to the national average are useful, we must also pay close attention to whether the local supply of scientists and engineers is keeping pace with demand for these workers. Therefore, this indicator should be viewed alongside measures like High-Tech Jobs and Management, Professional, and Technical Jobs.

Utilization of the State's High-Technology Tax Incentive Program, known as Act 221, provides a measure of high-tech firm formation and investment in high-tech infrastructure that may not register in other indicators. It also provides a way to gauge the ongoing relevance of the tax incentive program to local businesses. Naturally, there is no comparable national figure for utilization of our unique high-tech tax incentives, so state rankings are not applicable.

Findings

Overview: Hawai'i lags behind the rest of the nation in development of high-tech firms and industries, but there are recent signs of improvement.

The available data suggest that Hawai'i trails the rest of the nation in the development of its high-tech industries. Hawai'i ranked 46th among the 50 states in its share of high-tech employment. Jobs in high-tech industries represent less than 2% of the State's workforce compared to over 4% of the workforce nationally. Between 1992 and 1997, the number of high-tech establishments in Hawai'i grew just 33% compared to growth of 75% in these industries nationwide. In fact, Hawai'i ranked dead last in its growth of technology establishments during this period—far behind the next lowest state, Louisiana, which registered 47% growth during this period. Only three states, including Hawai'i, experienced high-tech growth below 50%.[12] More recently, though, annual growth of Hawai'i's high-tech sector has actually outpaced the national growth rate. Still, the slow growth of our local high-tech industries is a matter deserving continued attention and concern.

Within the past few years, Hawai'i has taken major steps to encourage the development of high-tech industries and has successfully focused public attention on the role of high-tech industries in economic development.

The State has successfully carved out a prominent place for high-tech industries on the economic development agenda. Policy makers have passed an important set of tax incentives that encourage investment in high-tech companies.[13] Three particular aspects of the law do much to encourage so-called qualified high technology businesses (QHTBs): an unprecedented tax credit for QHTB investment, a provision to allow the sale of QHTB net operating losses, and an income tax exclusion for QHTB stock options. (Other aspects of this legislation will be described in relation to other New Economy indicators). PPI hails this legislation as "one of the nation's most far-reaching New Economy packages."[14] The tax incentives have drawn an estimated $36 million of investments to Hawai'i over the past two years.[15] As of this writing, approximately 145 companies had applied for comfort rulings from the Department of Taxation, to be identified as QHTBs eligible for high-tech tax credits.[16] The private sector has also established supports for the high-tech industry such as HiBEAM—a business accelerator program that helps young high-tech companies expand their business and access venture capital. The effects of these interventions have yet to bring Hawai'i up to par with the rest of the country, but their utilization and impact should be monitored closely.

The number of locally produced scientists and engineers—the drivers of high-tech development—has dwindled over the past ten years.

Hawai'i ranks relatively high in terms of the number of scientists and engineers in its workforce—18th among the states. Yet, declining enrollment in local science and engineering programs is cause for serious concern. The number of students earning bachelors and masters degrees in engineering from the University of Hawai'i fell from 205 to 126 between 1995 and 2001 and enrollment in the College of Engineering declined steadily over the same period from 958 to 705. Enrollment of graduate students in the natural sciences also fell significantly, from 439 to 388 during this same period.[17]

In 2002, the U.H. College of Engineering began to implement a new strategic plan focused on improving the school's faculty, boosting enrollment, and establishing new research centers. One highlight of the plan is the school's proposal to create an Engineering Clinic Program that will organize teams of four or five undergraduate students to engage in project-based learning experiences helping private industry tackle real problems.[18] The addition and expansion

of programs like these are essential to ensure the economic relevance of university programs for students and for Hawai'i's emergent high-tech industries. Stronger links between schools of engineering, the natural sciences and business administration would also encourage commercial application of new technology that generate real economic development impact for Hawai'i.

The keys to improving our performance in tech-sector development appear to lie in the other four New Economy areas where Hawai'i has not been able to focus attention, ideas and resources.

Taken together, our New Economy indicators suggest that we have the human capital needed to build high-tech industries—a good concentration of scientists and engineers, an educated workforce, and ample Internet access among citizens, but we have yet to turn these assets into successful high-tech firms and jobs. In addition, many public policies and private initiatives have been undertaken to support high-tech firms and draw attention to the importance of the sector in Hawai'i. Yet barriers to growth of the sector may lie outside our narrow focus on technology industries. In the following sections, we will discuss how venture capital activity is limited, how we rank next to last in the nation in our level of private industry research and development, how our non-tech businesses are not using technology widely, and how our government ranks low in its overall efforts to digitize. These obstacles are critical to growth of the high-tech sector, but fall outside the traditional focus on tech-specific supports and interventions.

Recommendations

In the old style of economic development, stimulating growth meant providing government subsidies to specific businesses and wooing companies to relocate to or expand in your jurisdiction. Hawai'i has had much experience with these tactics. Most recently, the 2002 legislature passed a measure to provide a $75 million tax credit for an aquarium development project at Ko Olina. Former Governor Cayetano ultimately vetoed the measure despite developer claims that 10,000 construction jobs and 2,000 permanent jobs would result. This tax credit has reemerged in the 2003 legislative session.[19]

Old economy strategies such as these could still conceivably create public value, but a smart New Economy strategy would also make such substantial investments in the industries that build skills and knowledge needed in the New Economy—it would focus on creating good New Economy jobs rather than merely a lot of jobs. Good New Economy policy will also demand more accountability from the beneficiaries of incentives and measure actual results. These types of policies would not only begin to show outsiders that Hawai'i is becoming business friendly, but also that it is becoming business smart.

New Economy strategies will have government finding ways to spur the development of homegrown industries through targeted incentives, improving other quality of life measures, developing a skilled workforce and building technological infrastructure. Fortunately, Hawai'i has already taken a significant step in this direction by passing what is truly progressive legislation to spur high-tech development. With this task accomplished, Hawai'i can now turn its attention to the following:

Should do

- Set measurable, achievable and broadly accepted objectives for job and firm creation in high-tech industries. An aggressive, but achievable goal might be to create about 1,000 new high-tech jobs and support 50 new high-tech firms per year over the next five years. This rate of growth would be consistent with our recent performance and would allow us to approach parity with other states.
- Closely monitor the effects of Act 221. In particular, we should monitor utilization of tax incentives, and their impact on investment in, and creation of, new high-tech firms and high-tech jobs. In a few years, a survey of QHTBs may provide valuable information on the benefits of our policies. In general, we should be patient and responsive to industry needs.
- Work as a partner with high-tech firms and researchers to better understand and address their challenges. Hawai'i's high-tech sector is growing in experience, building important relationships and becoming increasingly organized. Our research facilities and the people that work in them are becoming increasingly renowned. These are assets for government to learn from, encourage and nurture.
- While maintaining high-tech development as a priority, refocus public attention to the other four characteristics of the New Economy: creating an innovative and entrepreneurial culture; helping our workers and our companies become more global; infusing all sectors with technology; shifting our focus toward creating skill-building jobs and an educational system to match. Growing public support for initiatives in these areas will be critical to the continued growth and prosperity of the high-tech sector in Hawai'i.

Ideas to consider

- Pass business incentive accountability laws that will ensure project disclosure, tracking and evaluation, and even restitution of public subsidies for private businesses. Note, however, that such an effort would likely be seen as anti-business without a parallel effort to invest in the New Economy. The idea here is to save money from ineffective old economy strategies to invest in good new strategies.
- Take steps to expand links between university programs in the natural sciences and engineering with business administration programs and private industry. Replicate the Engineering Clinic Program in mathematics, natural science, agricultural sciences, and other fields.

Observations and Questions

Act 221 is not just any pro-business legislation: Hawai'i has a history of progressive legislation. In areas such as employee benefits, social services and social justice, Hawai'i has often led the nation with creative ideas. In this vein, Act 221 is also landmark legislation. But Act 221 also shows that Hawai'i can be just as innovative with its economic policy as it is with its social policy. Much has been made of the fact that an early beneficiary of the act was the production company for the movie, "Blue Crush"—a project that is now gone along with its $16 million State subsidy. A recent report by the State Tax Review Commission recommends reexamination of business tax incentives.[20] These criticisms come at the very moment when many policymakers have concluded that Act 221 should be left alone for the time being.[21] Both supporters and critics of Act 221 make important points. Any tax incentive should be well crafted using good cost-benefit analysis, monitored and periodically evaluated. And, its goals should be part of a larger economic strategy. But business also flounders in an environment of uncertain

policy, so lawmakers must commit to the policy paths they map out. Rather than ask "is Act 221 currently working or not?" a better set of questions to ask at this point might be: *What economic vision is Act 221 supposed to advance? Are we purposefully designing these incentives to meet specific economic goals or are we creating haphazard market distortions and hoping for the best? How do we plan to evaluate the effectiveness of Act 221 and when can we say that it is or isn't working?*

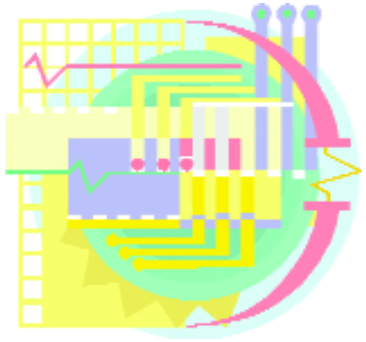
High-tech is not the savior: In November 2002, the Department of Business, Economic Development and Tourism reported that the private technology sector job growth was 4.1% in 2001 compared to just 0.7% growth in the rest of the private sector.[22] Leading with this statement hides a critical fact—according to DBEDT data, technology jobs represent 3% of all private sector jobs. A 4% increase in 3% of all jobs represents only one new technology job per one thousand existing private sector jobs. Not a whole lot. Hawai'i should neither overestimate nor underestimate the impact of high-tech industries. High-tech jobs tend to be higher paying and high-tech companies have much growth potential. At the same time, many other sectors could benefit from tech infusion, exposure to broader global markets, and government support. *Other than high-tech and tourism, what other industries have sufficient economic and social potential to deserve more focus from the public and its policymakers?*

Collaboration is often necessary: Construction of a 200-kilowatt photovoltaic park in 'Ewa is set to begin in 2004. Besides producing electricity, the project will produce key knowledge about efficient energy technologies. The project partners are Hawaiian Electric Company, the Hawai'i Natural Energy Institute of the University of Hawai'i's School of Ocean and Earth Science & Technology, and the U.S. Navy.[23] For maximum success, this project will undoubtedly need positive interactions with State and Local government, other private industries, and community groups.

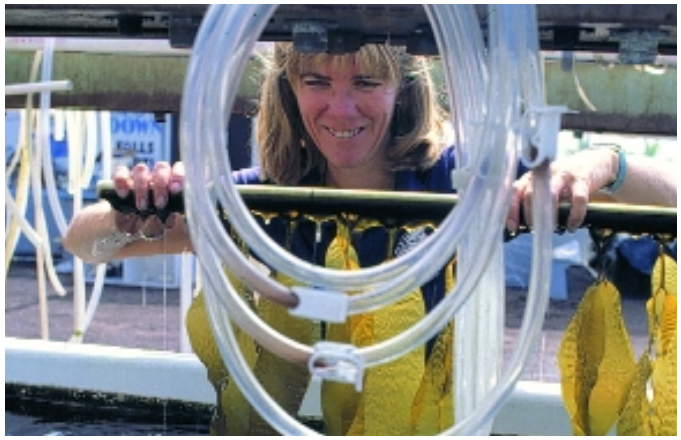
Exciting plans to turn the planned Kaka'ako campus of the U.H. medical school into a hub of biotech business will also require a major collaboration.[24] Because of rapidly changing information, increased specialization and complex problems, high-tech endeavors often require a higher degree of collaboration than our economy has ever seen. Collaboration is often critical in the fast paced world of technology. *What are appropriate roles for government in initiating, facilitating, or participating in these collaborative efforts?*

Business attraction costs and benefits: The newly elected Governor has proclaimed that, "Hawai'i is open for business." Banking on the "quick dividends" of bringing in outside companies, Governor Lingle has said that the State will do its part to inform prospective businesses about our multi-ethnic heritage and to ask for respect of the pristine physical environment.[25] Laws like Act 221 can be powerful magnets for businesses to locate in Hawai'i. Such business attraction tactics have been utilized across the country for decades. They can be effective, but they are extremely tricky. Whether the job creation, knowledge, experience, and income generated by these companies outweighs the cost of business subsidies and social costs is a complex economic question that many pose but few try to answer. This is particularly troubling since environmental, social and cultural ill effects are often irreversible. *In adopting and evaluating a business attraction strategy, how do we know if we are creating new jobs for local residents or merely displacing them with imported expertise? What is the balance of all social benefits and costs of attracted businesses? Are attracted businesses having a net positive or net negative effect on locally owned establishments and startups? We know why businesses eligible for Act 221 benefits would come to Hawai'i, but why will they stay after subsidies dry up? Are there social and cultural costs to increasing foreign ownership that Hawai'i is consciously willing to bear?*

Technologically Infused Industries



Hawai'i has had some positive legislation and e-government initiatives, but a narrow focus on the high-tech sector has diverted attention from the need for all sectors to adopt new technologies.



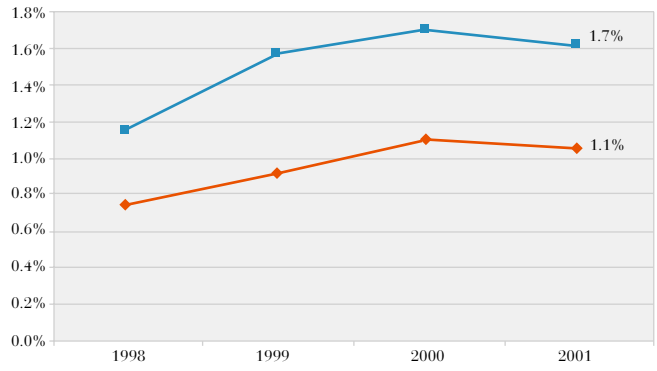
Indicators

IT Jobs in Non-IT Industries

IT occupation employment in non-IT industries as a share of total jobs

Source: U.S. Census Bureau, County Business Patterns, 1999 to 2001; U.S. Bureau of Labor Statistics, Occupational Employment Survey, 1999 to 2001.

Hawai'i Rank #37



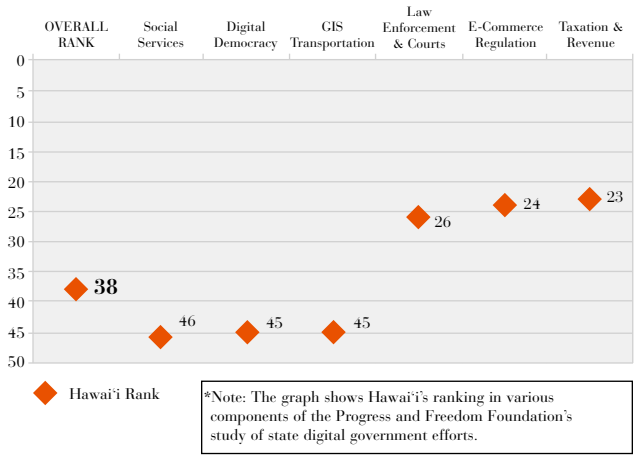
This measure provides a sense of the extent to which industries are employing network administrators, programmers, and other tech-related workers. The presence of these workers, in turn, indicates that the industry has adopted information technologies (IT). Ideally, we would directly measure the number of firms that have adopted technologies like local area networks, databases, Internet access, e-mail and the like, but measuring IT jobs is the best proxy we have given the available data. Comparing ourselves to the nation and other states is meaningful in this case because by looking at only non-IT industries, the measure controls for the presence of large IT/high-tech industries in a state. Therefore, tech-heavy states like California or Massachusetts are theoretically placed on equal footing with Hawai'i.

Digital Government

A measure of the utilization of digital technology in state government

Source: The Progress & Freedom Foundation, The Digital State 2001.

Hawai'i Rank #38



*Note: The graph shows Hawai'i's ranking in various components of the Progress and Freedom Foundation's study of state digital government efforts.

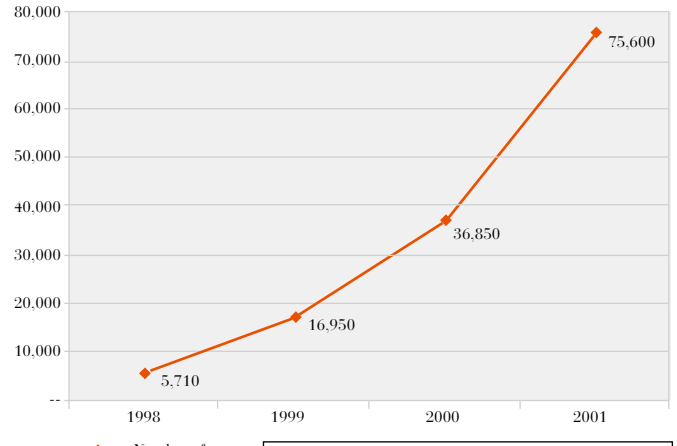
Like other industries, government can cut costs, increase efficiency and improve quality of service by adopting new technologies. New technology can also help government increase citizen involvement in the democratic process. Finally, government agencies can lead by example, encouraging residents and businesses to adopt new technologies. PPI draws from two sources for its measure: a survey of state CIOs by the Progress and Freedom Foundation, and a Brown University analysis of state government websites (Hawai'i ranked 37th).[26] We used the PFF ranking and analysis because it explored digital government in greater depth, but both studies allow for useful comparison of states on an annual basis.

Commercial Domain Names

The number of commercial Internet domain names (.com) per firm in the state

Source: Matthew Zook, University of California Berkeley www.zooknic.com/Domains/alpha.html

Hawai'i Rank #8



Domain names per firm:
Hawai'i 1.16 U.S. 0.95

*Note: The graph shows the number of commercial domain names, not domain names per firm because trend data on total firms was unavailable.

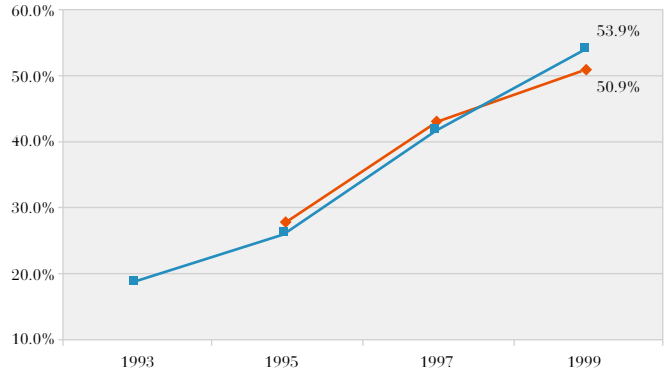
The number of commercial domain names indicates the extent to which local firms may be using the Internet to market products and services and conduct transactions. Obtaining a domain name is a fairly simple administrative task, and the presence of a domain name is not a perfect proxy for business usage of the Internet. Still, the indicator is useful, and comparison to the national average and to other states is instructive. It would be rendered more useful if the measure were expanded to include nonprofit organizations (.org) in addition to businesses, particularly since Hawai'i has a relatively large nonprofit sector.

Online Population

The percentage of the population with Internet access in the state

Source: National Telecommunications and Information Administration, A Nation Online: How Americans Area Expanding Their Use of the Internet, 2001.

Hawai'i Rank #40



The number of persons online is probably the most basic indicator of a state's progress toward infusing its economy with technology. It is also a good measure of the extent to which the population is prepared to use the Internet in business and work. As the graph indicates, the percentage of people online increases dramatically from year to year. State figures and rankings are also subject to substantial change between years. Therefore, comparing ourselves to the national average and to the national trend are important complements to tracking our ranking among the states.
Other useful measures would attend to digital divide issues by examining differences between urban and rural, poor and affluent communities in Hawai'i.

Broadband Access

Measure of the use and deployment of broadband telecommunications infrastructure

Source: Pinkham Group, Broadband Market Study—DSL Current Deployment and Availability Q3 2001; Federal Communications Commission, High Speed Services for Internet Access, 2001.

Rank	State	Score
1	Massachusetts	5.42
2	California	5.22
3	New Jersey	4.74
19	Hawai'i	3.26
48	Vermont	1.55
49	Alaska	1.23
50	West Virginia	0.96
	U.S. Average	**3.00**

*Note: This indicator, used by PPI, is a combined measure of high-speed lines (DSL, cable, and other methods) per household and establishment, and the percent of households in ADSL range

The ability to transfer large amounts of data efficiently is critical to businesses that deal with faraway consumers, partners and suppliers. Broadband capacity is also critical to enabling new services like distance learning and tele-medicine that enhance productivity and quality of life. Like online population, broadband access is partly dependent upon the proportion of a state's population in rural and outlying communities, and states differ widely in this regard. Therefore, tracking our own improvement over time and comparing ourselves to the national average is probably more instructive than comparison to other states.

Findings

Overview: Hawai'i lags behind other states in the extent to which its government and industries are technologically infused.

The available indicators suggest that neither Hawai'i's government nor its private sector have adopted the use of new technology to the extent that other states have. Hawai'i ranked 38th on the Progress and Freedom Foundation's Digital State index and their study found that Hawai'i still lacks a statewide IT architecture and an e-procurement system—features which many other states have already implemented.[27] While there are positive signs—the City and County of Honolulu twice ranked number one in an annual Digital Cities survey by the Center for Digital Government[28]—there is still much work for the State as a whole.

The picture of technology use in private industry in Hawai'i is mixed. On the one hand, there are signs that Hawai'i firms are using the Internet in their ventures with a relatively high number of domain names and solid e-commerce potential. However, our non-IT firms have few tech-related positions (network administrators, web developers, desktop support specialists) compared to similar firms in other states, (we ranked 37th in this area) suggesting that technology use among local businesses remains relatively low.

Technological infusion of our industries and government ought to be a high priority. Technology is the elbow grease of the New Economy—its widespread adoption is vital to maintaining a competitive position in the global marketplace. Furthermore, local utilization of hardware, software, and technology-related services creates a local market for high-tech firms.

Unlike the promotion of high-tech industries, the adoption and use of technology across all sectors—including non-tech businesses, government and nonprofits—has not been a policy focus.

While the State has successfully focused policymaking on promoting high-tech industries, the widespread infusion of technology into non-tech industries has been less emphasized. The technological modernization of firms has not been a priority articulated by public leaders and specific policy proposals that would encourage technological infusion have not received the same level of support that high-tech incentives have.

For example, a proposal to establish a State Chief Information Officer was rejected by the State Legislature in 2001 and 2002.[29] The presence of a State CIO could help ensure timely and coordinated acquisition of appropriate technology and the maintenance of existing hardware, software, and management information systems across all government agencies. The legislature also provided only partial funding through a Grant in Aid for a proposed New Economy Transition (NET) Program.[30] The program would have created Technology Extension Agents to help local businesses identify and address their technological needs.[31] Modeled after successful agricultural and manufacturing extension programs (both of which operate in Hawai'i) the program was designed to encourage the adoption of technology in the private sector.

One bright spot in the area of technology infusion was the passage of a technology infrastructure renovation tax credit. Part of the recent series of high-tech legislation in Hawai'i, this nonrefundable income tax credit is for 4% of the cost of planning, designing, installing, constructing and purchasing equipment to provide a commercial building with technology-enabled infrastructure. Though originally designed to benefit building renovations for high-tech firms, the tax credit benefits any business that uses technology.[32] Data on the utilization of this tax incentive were not available at the time of this writing.

In spite of progress in using the Internet to improve government services, some areas of web-related service still require improvement.

In some areas, Hawai'i ranks well in its use of Internet technology to improve government services. Hawai'i scores particularly well in its use of technology to ease regulatory and reporting burdens for businesses and making taxation more efficient. However, we score poorly in our efforts to digitize our social services (e.g., few forms available online, no online applications for public assistance); use of digital technology in the justice system; and use of technology to enhance the democratic process (no election research online and limited electronic voting and legislative proceedings). Our use of technology in public management and administration is mixed. As mentioned, Hawai'i is behind other states in development of a statewide IT architecture and has a very limited e-procurement system.[33]

Action is already being taken to address some of these deficiencies. At present, the Kansas-based National Information Consortium, Inc. (NIC), a nationally recognized leader in e-government development, manages the design, development, expansion and maintenance of the State of Hawai'i's e-government services. NIC plans to expand web-based services in the judicial system including online access to jury pool applications, traffic abstract access, and traffic violation payments.[34] In addition, Hawai'i was one of four states in the nation awarded $1 million by the U.S. Department of Justice to enhance information sharing among county and federal law enforcement, the courts, and corrections officials.[35]

The two areas most likely to remain technologically challenged are human services and elections. These areas may continue to lag, in part, because of the way NIC finances development of e-government services: Rather than charge state governments directly, NIC charges the public a convenience fee on top of the fees government ordinarily charges for things like licensing, traffic abstract requests, and permitting. As a consequence, these services are the first to go online, while those that government provides to the public free of charge usually go online later. Hawai'i does not charge individuals for most human services and election-related services, and neither is on NIC's development agenda at present.[36] Direction by Hawai'i policy makers may be required to speed the use of technology in these two areas.

The lack of technological capacity in the nonprofit sector will require special attention.

The infusion of technology into the nonprofit sector should concern us because nonprofit organizations are an important segment of Hawai'i's economy. Nonprofits represent a larger share of total businesses, employment, revenue and payroll in Hawai'i than in most other states. They have also been one of the few growth sectors in Hawai'i during the past decade: between 1992 and 1997 while the overall business count fell by 1%, the number of nonprofit service agencies grew by 11% and revenues grew by 36%—the most of any industry sector in the State.[37] Moreover, contrary to popular perception, nonprofits are relatively stable employers—three-quarters of those with annual revenues over $25,000 have been in existence ten or more years.[38]

Nonprofits are, by nature, information-intensive enterprises, having to manage data on clients, funders, and outcomes in addition to managing a financial bottom line. Yet, there is evidence that the sector lacks capacity to optimize use of new technology. In 2001, the Hawai'i Community Foundation commissioned a study of local nonprofit organizations and found that "effective use of technology" was among five priority areas of concern for nonprofit executives.[39] Infusing this industry with technology would yield meaningful improvements in efficiency and organizational effectiveness. Because tax incentives are ineffective in the nonprofit arena, alternative interventions that involve participation of government and philanthropic entities will be needed to encourage nonprofits to adopt appropriate technology.

Hawai‘i has the building blocks necessary to promote technology infusion in its government and industries.

Although the available indicators suggest that Hawai‘i’s industries and government have not become technologically infused to the extent that other states have, there is also evidence that we have valuable assets to build upon. Our percentage of people who are online is encouraging, and our online growth rate continues to exceed the national growth rate. The measure suggests that our citizens have the capacity to use technology in the workplace as well as in the home. A respectable ranking in broadband access, indicates that we have some of the technological infrastructure necessary to allow businesses to become tech-infused. We have assets required to ensure broad infusion of technology into all sectors. We must now make the right, targeted investments to turn these assets into New Economy returns.

Recommendations

To date, our efforts in the area of technological infusion have been inadequate. The focus has been on building high-tech industries rather than infusing all industries and sectors with new technologies. In the old economy, we understood that businesses and citizens needed an infrastructure of roads and utilities. While these remain important, a new infrastructure of technology and information systems is needed to make the economy grow.

In the past, business assistance often meant help for marketing products and services rather than empowerment toward becoming more efficient and effective. Today, government should utilize market forces to encourage the rapid deployment of new technology in all sectors. This will spur workforce development and will also help create a local market that high-tech startups can use as a springboard. Once again, Hawai‘i is moving in the right direction—the technology infrastructure renovation tax credit and e-Government strategic initiatives are positive steps. We also have some of the elements required to enable technological infusion. However, much more can be done.

Should do

- Set a measurable, achievable and broadly accepted objective for IT employment in non-IT industries. An ambitious but achievable goal might be to create 750 new IT jobs each year for the next five years. At this rate of job creation, Hawai‘i would likely approach parity with the other states at the end of the five-year period.
- Work with the business sector to reexamine the proposed Technology Extension Agents (part of the NET Program) to encourage adoption and use of appropriate technology in the private sector. Any effort to expand the program should ensure that small businesses and nonprofit organizations have adequate access to services.
- Carefully monitor and assess the effectiveness of recently passed high-tech renovation tax credits. In a few years, a survey of these firms may provide valuable information on jobs created or retained, the types of technology enabled by renovation, and any modifications needed to the legislation.
- The eHawai‘iGov Oversight Committee (responsible for managing the development of Hawai‘i’s e-Government web services) should work with NIC (the portal development contractor) to ensure timely infusion of Internet technology in human services and elections.

Ideas to consider

- Policy makers and philanthropy leaders can create a special set of programs or funding streams to encourage and empower nonprofits to purchase new technology.
- Invest in the technological infusion of rural areas including support for effective tech training in community-based settings and support for Internet connectivity in homes and businesses in low-income and rural areas.
- Fund and implement a State Chief Information Officer position to oversee acquisition and maintenance of appropriate technology in government.
- Reexamine the budgeting process in State agencies and how it may create barriers to technological upgrading and deter proper IT planning.
- Create incentives and provide assistance for online commerce to help local businesses sell products to broader markets.

Observations and Questions

Technology touches every industry: Local companies and organizations are constantly making decisions about technology infusion. Foodland offers online grocery shopping. Hilton Hawaiian Village greeters can check people in through their handheld front desk. Aloha Airlines and Hawaiian Airlines recently announced the conversion to paperless ticketing. Rarely a day goes by without a report of a new technology being used at a hotel, restaurant, hospital, theater, government office, car dealership, law practice, farm, newspaper, social service agency, bank, television station, school—any and every business or organization. These decisions are difficult ones with many uncertainties—how long will it take to recoup the initial investment in new technology, when might the technology need to be replaced due to obsolescence, how will consumers respond to new technology, what training or changes to the company's labor force must occur? *What kinds of policies would assist businesses and organizations in answering these important questions?*

E-commerce possibilities: A 2000 study by University of Hawai'i professor Dr. Tung Bui found that 62% of the Hawai'i business leaders that he interviewed believed Hawai'i was behind the mainland in e-commerce. However, his findings pointed to a different truth—Hawai'i businesses seem to be excelling in having a web presence, presenting online information, allowing online ordering, gathering customer feedback and sharing links to other business partners.[40] Given our geographic location, e-commerce can be a tremendous asset to Hawai'i businesses. *What are the forces behind our apparent current success and how can we continue to improve?*

Transitions to technology will not be easy: At the heart of the recent West Coast dispute between the Pacific Maritime Association and the International Longshore and Warehouse Union was the introduction of new technologies such as global positioning equipment and rapid-scanning software. The ILWU did not take a stand against technology. Rather they framed the dispute around union membership of new technology workers and the labor transitions involved in this technological infusion. This dispute was a preview of things to come when new technologies threaten jobs in government and other industries. *How will these disputes be resolved in Hawai'i and what are appropriate stances of labor unions and employers? Are we proactively and collectively looking ahead to these transitions? What job opportunities await workers displaced by new technologies?*

New Kinds of Work

We are still acting like an old economy workforce with old economy indicators and old economy institutions.

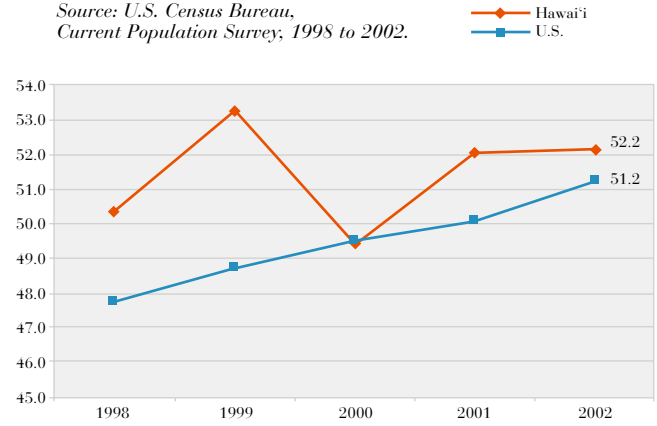
Indicators

Educational Attainment of the Workforce

A weighted measure of the educational attainment of the workforce

Source: U.S. Census Bureau, Current Population Survey, 1998 to 2002.

Hawai'i Rank #17



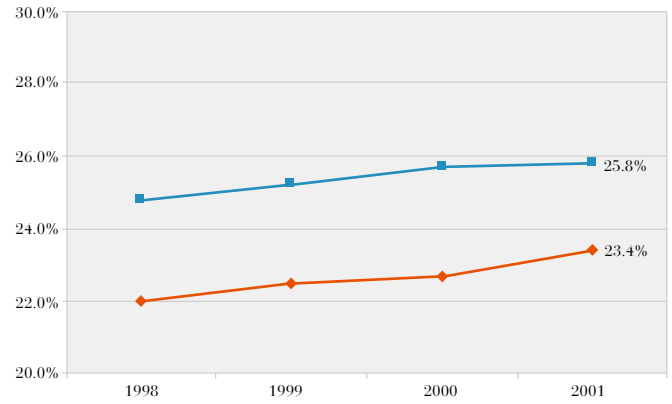
The New Economy puts a premium on adaptability, speed, and critical thinking—characteristics that often go hand-in-hand with education and training. Measuring educational attainment is the best available proxy for gauging the capacity of the workforce to compete in, and contribute to, a New Economy. Ideally, we would measure the specific capacities of the workforce that matter in the New Economy, including things like computer literacy, familiarity with software and the Internet, a global perspective, and creative thinking. These skills are not always reflected by one's educational attainment. Furthermore, the New Economy depends upon life-long learning through distance education, non-degree courses of study, and on-the-job training. We should therefore continue to look for alternatives to this indicator.

Managerial, Professional and Technical Jobs

Hawai'i Rank #41

Managers, professionals and technicians as a share of the total workforce

Source: U.S. Bureau of Labor Statistics, Occupational Employment Survey, 1997 to 2001.



The shift to a New Economy means a new mix of jobs in the economy. Managerial, professional, and technical jobs increase as a share of total employment as an economy becomes more service oriented and cultivates industries that produce knowledge. The mix of industries varies from state to state, making state occupational structures vary as well. Therefore, our own trend and comparison to the nation as a whole should be tracked in addition to state rankings. This measure should be weighed in conjunction with measures of workforce preparation so that attention is paid to balancing supply and demand for skilled workers in Hawai'i. In addition, the definition of "managerial, professional and technical" should be reviewed regularly since the technology and skill requirements in many jobs are likely to change rapidly in a New Economy context.

Technology in Schools

Hawai'i Rank #45

A weighted measure of five factors measuring computer and Internet usage in the schools

Source: Education Week, Technology Counts, 2002.

The combination of computers, Internet access, trained teachers and appropriate applications of computing technology in the classroom contribute to development of a workforce that is prepared to use technology in the workplace. The data for this measure come from a comprehensive national survey called the National Assessment of Educational Progress. The survey methodology changes periodically making tracking Hawai'i's performance over time difficult, so our state ranking is probably the most useful benchmark in this case. It is also important to note that most of the available data measures inputs like computers and Internet connections and not the outputs of effective teaching and learning about technology.

Findings

Overview: Hawai'i has a workforce that appears, in some respects, well prepared, but we have failed to create the New Economy jobs and opportunities to capitalize on this valuable asset.

Hawai'i has a fairly well-educated workforce compared to other states, ranking 17th among the states in workforce educational attainment. More than 61% of our workforce has some schooling beyond high school—a rare achievement among the states. We have also succeeded in pioneering some applications of technology in schooling, in making broadband Internet services accessible to most communities, and in educating workers even in old economy industries like manufacturing. Still, the most glaring figure in this area is our poor showing in the number of Managerial, Technical, and Professional Jobs where we rank 41st among the states. Our low ranking in this area suggests that we have failed to create the kind of New Economy employment that would provide good opportunities for our educated workforce.

We lack the appropriate data to effectively gauge whether Hawai'i's workforce is well prepared to function in the New Economy.

The data we currently collect on workforce preparation are not well suited to the task of assessing New Economy capabilities. In many ways, what we collect today continues to reflect old economy priorities: K-12 education, advanced degrees, and standardized test results that focus on basic skills. These indices measure the skills needed in an economy dominated by bureaucratic organizations, mass production, and local markets. Indeed, the data we gather presumes that a college degree secures economic opportunity and success. Unfortunately, we have very little information on the capacity of our workforce to use or produce new technology, understand global perspectives, and be flexible and entrepreneurial. Nor do we know much about worker participation in continuing education programs or on-the-job training—key sources of skills and knowledge in the New Economy. Our existing data collection efforts are for old economy measures that must be revised if we are to truly gauge our progress in creating a New Economy workforce.

Our economy is laden with old economy positions.

The largest occupations in Hawai'i by number of jobs are Retail Salespersons, Janitors and Cleaners, Cashiers, General Office Clerks, and Waiters and Waitresses[41]—hardly the "knowledge jobs" of a New Economy. Not only do these jobs fail to build the technical skills, knowledge and entrepreneurial habits needed in the New Economy, in many cases, they also fail to offer living wages, full-time employment, or career opportunities. As a consequence of this undesirable occupational mix, Hawai'i has the highest number of "involuntary part-time" workers (those who are working part-time but would prefer full-time work) of any state in the nation, and lower wage levels than the national average in spite of a higher than average cost of living.[42] The data seem to indicate that our economy has not undergone a technology-driven structural shift on par with that of other states; and that consequently we have failed to create the number of skilled and professional positions that other states have.

We are failing to bring technology into our schools and use it to prepare our students for the New Economy.

Our efforts to make technology available to students and use it to promote learning lag behind the rest of the country. Our schools continue to have fewer instructional computers per student and fewer multimedia computers per student than most mainland

schools. Our ratio of students to instructional computers is 5.5 to 1 compared to a national average of 4.2 to 1. When it comes to *using* technology in instruction and learning, our teachers and students are also behind the rest of the nation. In Hawai'i, 29% of teachers classify themselves as "beginners" in using technology versus a national average of 22%. Hawai'i teachers are less likely to use computers in instruction than in other states: our 4th and 8th graders are less likely to use computers in their math classes than the national average, and Hawai'i teachers are less likely to use the Internet for instruction than mainland teachers.[43] This may reflect, in part, the fact that Hawai'i does not require technology training for initial licensure or re-certification of teachers. We have begun creating virtual learning opportunities—A virtual public high school, the Myron B. Thompson Academy, has 112 students and may pave the way for future innovation.[44] We have also done relatively well in ensuring equitable access to technology regardless of income. Yet, much more work needs to be done if we are to adequately prepare our children to function in the New Economy.

A disparity of outcomes between private and public schools bodes poorly on closing gaps in opportunity and ensuring that all Hawai'i students are prepared to thrive in a New Economy.

Hawai'i enjoys some of the best private school education in the country. Many in Hawai'i's middle class face a decision of whether to pay private school tuition for the perceived promise of educational opportunity or to send their children to public school free of charge. For many more, private school is simply out of reach. The vast perceived and actual inequities of educational outcomes are beginning to make the private school "choice" a growing social problem in Hawai'i. Again, for lack of good outcome measures to contrast public and private school students, we demonstrate this disparity with less-than-perfect available data: the Scholastic Assessment Test, or SAT, is a common college entrance exam required by most undergraduate institutions. It provides a measure of both math and verbal abilities. In 2001, Hawai'i's public school students averaged scores of 463 verbal/488 math compared to the national average of 506/514. In contrast, Hawai'i students of private religiously affiliated schools averaged 523/546 and Hawai'i students of independent private schools averaged 545/598.[45] We could give kudos to private schools, but we also must remember that over 80% of Hawai'i's children attend public schools.

Some claim that private school students outperform public school students because they have better teaching, better administration, more supportive parents, more school resources, less legal restrictions or better students. Yet regardless of the actual causes, the divide between public and private school performance is a disturbing problem for Hawai'i. We find ourselves with a system where the best educational preparation is not publicly provided, but is instead accessible to those with the greatest means. It is not so hard to imagine that continuing in this fashion will lead to an increased disparity of educational and economic opportunity within Hawai'i. Everyone stands to lose from this state of education.

Recommendations

As a result of the New Economy, states and countries are witnessing dramatic shifts in their occupational structure, the demand for skills, and their systems for training their workforce. In spite of this changing tide, Hawai'i's approach to employment and workforce development continues to be old economy in nature. In old economy fashion, we continue to judge our workforce success by low unemployment rates rather than the quality of employment we are creating. We also tend to look at workforce development and economic development separately rather than as two sides of the same coin.

Creating good New Economy policy demands a change in perspective. Instead of tinkering with inputs and outputs, we must look for driving forces and ways to measure actual outcomes. Instead of focusing on paper credentials, education must be viewed as a life-long process focused on the ability to learn and adapt. We must invest in preparing a new generation of workers and innovators, upgrading the current workforce, and improving the quality of life to retain the most qualified people. We cannot measure our success in low unemployment rates—it is very possible to have low unemployment and still be sliding backward in the New Economy. Instead, we must measure success in the *quality* of jobs we create and in the close matching of our educational systems with the needs of industries and firms that populate the New Economy. Some of the steps Hawai'i can take include the following:

Should do

- Set measurable, achievable and broadly accepted objectives for creation of managerial, professional and technical positions that reflect restructuring of the economy. An ambitious but achievable goal might be to reach parity with the national ratio of management and professional employment within five years. This would require creation of approximately 3,500 new management, technical, and professional positions each year.
- Creating more management and professional positions will require focused support of growth industries that support employment in these occupations. Examples include healthcare, education, and select business services in addition to the high-tech industries that have been our recent focus.
- Start measuring participation in on-the-job training, and continuing education programs by field of study. We should also start developing good tests and measures of New Economy competence that educators, business and industry can use. Because such measures are lacking nationwide, there is opportunity to innovate in this area.
- In all policy proposals, media coverage, evaluations and public statements, Hawai'i should place more emphasis on quality of employment and personal income as barometers of economic strength rather than on the unemployment statistic. Especially in Hawai'i, with its abundance of low wage jobs and its overqualified workforce, we need to focus on building job quality rather than quantity.
- The State should retool and expand the Employment and Training Fund program. Instead of the old economy, government-controlled effort, the State can give more flexibility to employers to train their own workforces. At the same time, the State can encourage training in certain fields or to specific populations of workers by providing incentives or matching funds. Employers and employees need to be consulted as to how to turn workplaces into lifelong learning environments.
- Make meaningful strides in improving the highly valued quality of life indicators for high skilled workers including quality public education, affordable housing, increased social justice, quality healthcare, reduced crime and substance abuse, a healthy environment, effective transportation systems and vibrant culture and arts.

Ideas to consider

- Improve use of technology in schools by requiring technology training as part of licensure and re-certification.
- Utilize public school and/or public library facilities to create training centers and education access points in every community.
- Create incentives for employers, unions or others to provide programs for low-skilled workers to gain literacy, remedial education, English as a Second Language, personal finance and other skills.

- Support partnerships between targeted industries (e.g., healthcare, education, business services) and education/job-training providers. Create customized training programs to meet these industries' needs, enhance their competitiveness, and help them grow.
- Enlist the help of private schools, universities and businesses to work with the Department of Education and other school reformers to improve various areas of educational administration.
- Address the reasons why Hawai'i-raised and -educated people have migrated to other locales. Work with employers and educators to consider ways of getting them to come back to Hawai'i to work.

Observations and Questions

Reforming schools: The No Child Left Behind Act (NCLB) is presenting significant logistical and philosophical challenges for Hawai'i. According to the federal law, 82 schools serving over a quarter of all public school students in Hawai'i are "failing" and need to allow families the choice of transferring their children to other schools. By 2013, every student in Hawai'i is supposed to be at "proficient" levels. A New Economy strategy requires a fresh look at how the educational system prepares people for life and work. But in the meantime, NCLB will be contorting the school system in its own way. *Is NCLB a logistical problem to be solved or can it fuel school reform that befits Hawai'i's New Economy? Will it lead to a more coordinated expression of the goals of education or will it lead to Balkanization of individual schools and deeper social class divisions?*

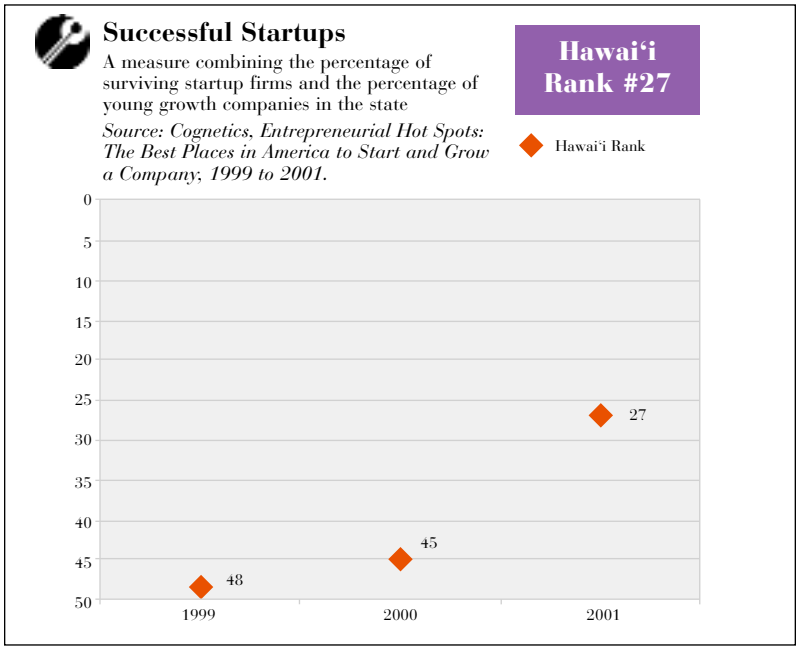
Supply and demand for jobs: In a recent survey of attitudes, Hawai'i's High Technology Development Corporation (HTDC) found that many stakeholders in high-tech felt recruiting, hiring and keeping technically skilled employees is one of the biggest challenges in Hawai'i.[46] The problem is one of both supply and demand. We can create jobs for technically skilled people in Hawai'i but we must also have the education and training systems to prepare our population for those jobs. Creating worker supply without demand will lead to exodus of the most skilled workers. Creating worker demand without supply will necessitate importation of labor and could lead to negative social consequences. *Are we adequately addressing both the supply and demand sides of skilled New Economy labor?*

Retraining for the New Economy: Suppose we achieve a New Economy vision for Hawai'i that aligns school goals to future careers and creates jobs that pay higher-wages and are more fulfilling. What will happen to the many thousands of people who are currently working in jobs that increasingly become obsolete? Hawai'i has experience with this—albeit not always successful experience—when people had to move from low skill jobs on plantations to low skill jobs in hotels. Now imagine moving a significant segment of the population who work in low-paying service jobs to jobs in technology and communications. There are some mechanisms in place today. County workforce investment boards are thinking about these issues, and the employer tax to fund the Employment Training Fund was made permanent in the last legislative session so that employees can access moneys for training. *Are these mechanisms enough to prevent large out-migration or increased joblessness or other negative social consequences of a transformation of the labor market?*

Innovative and Entrepreneurial Culture

While Hawai'i has a strong supply of hopeful innovators, they lack an adequate support structure of information, funding and advocacy to ensure higher rates of success.

Indicators



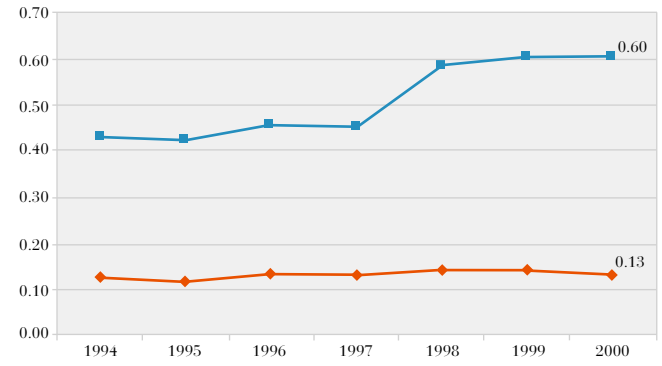
In the dynamic context of a New Economy, willing and able entrepreneurs are key ingredients for economic health. This indicator captures startup activity, startup success and growth of young firms—all good measures of entrepreneurial activity. Tracking our national ranking over time in this area is an appropriate use of this measure. We prefer this indicator as a yardstick of innovation and entrepreneurship over PPI's "Job Churning" measure because this focuses on business startup *and* survival. It also excludes business closures (included in Job Churning), which could be driven by factors other than economic dynamism (e.g., Hawai'i's protracted economic slump of the 1990s).

Patents

The number of patents issued to companies or individuals per 1,000 workers

Source: U.S. Patent & Trademark Office, Patent Counts by Country and State, Utility Patents, 2001.

Hawai'i Rank #50



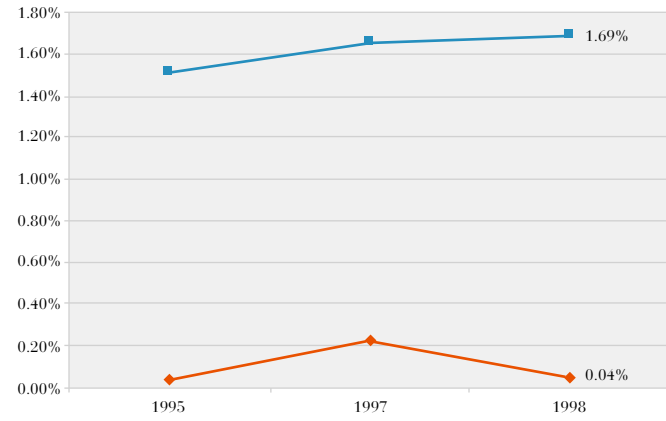
The number of patents issued to local individuals and firms is an indicator of the extent to which new products and processes with economic value are being created. Therefore, measuring the number of patents issued per 1,000 workers is a measure of business innovation. Comparison to other states and the national average are useful benchmarks, and tracking Hawai'i trends over time is also helpful. Useful complements to this indicator would assess supports for patent-seekers such as the number of available patent lawyers or consultants in the State.

Industry Investment in R&D

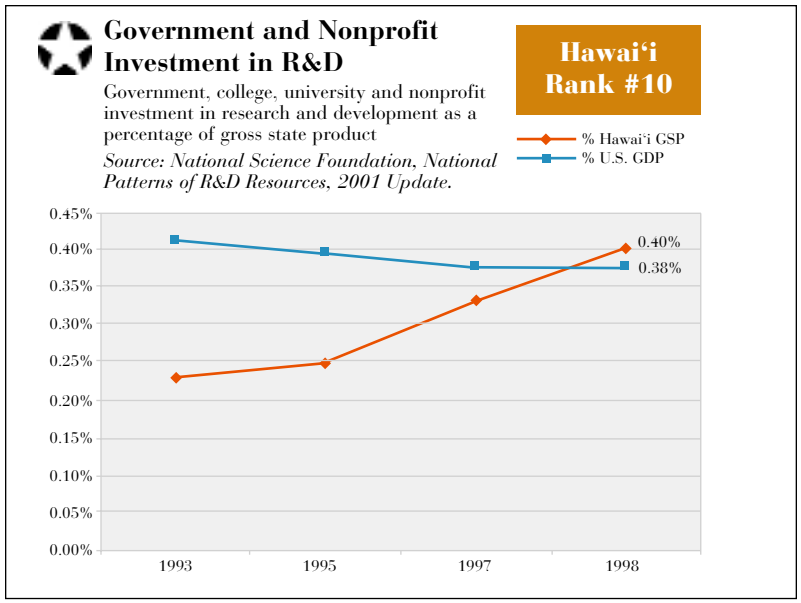
Private industry investment in research and development as a percentage of gross state product

Source: National Science Foundation, National Patterns of R&D Resources, 2001 Update.

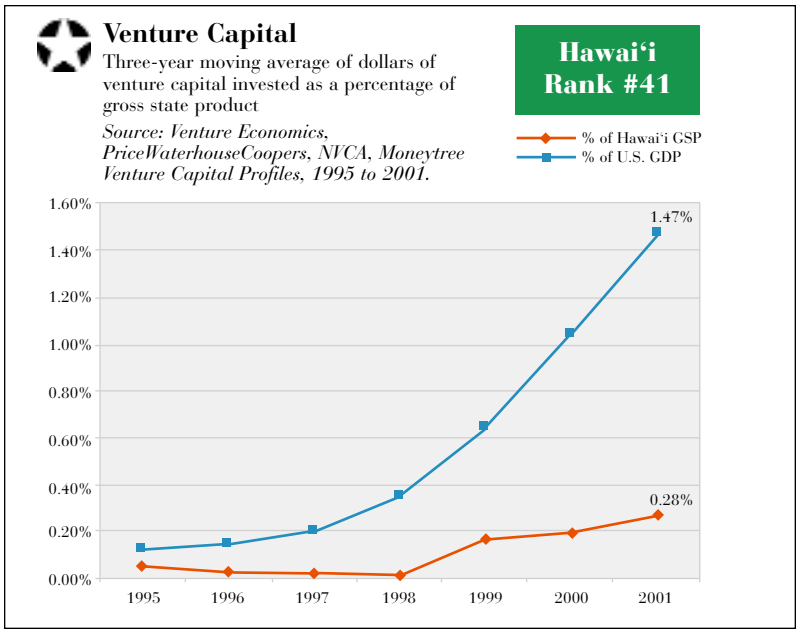
Hawai'i Rank #49



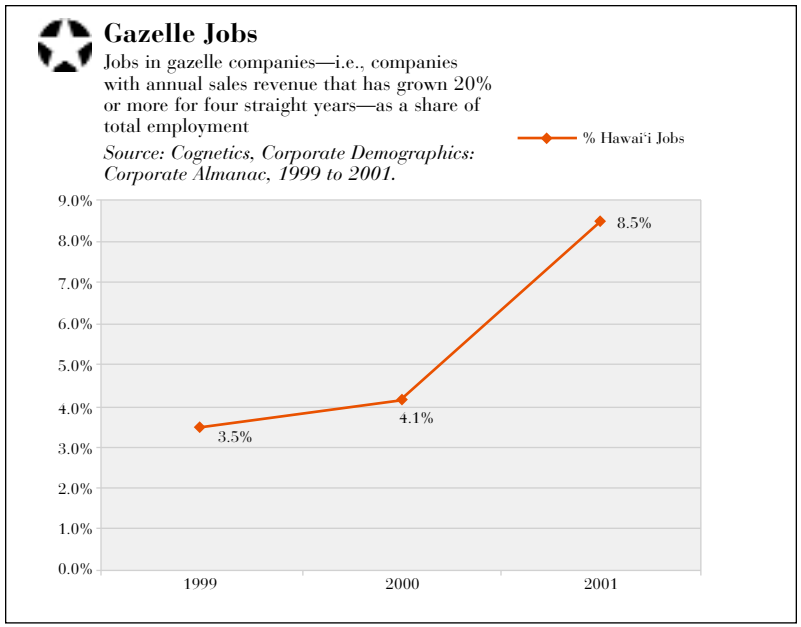
Business investment in research and development (R&D) generates product innovations and expands the knowledge base of industries—key drivers of growth in the New Economy. R&D leads directly to the creation of new products and processes and sometimes whole new industries. Industries differ widely in the extent to which they depend upon R&D (e.g., pharmaceuticals is R&D intensive, tourism is not), and a state's industry investment in R&D will depend largely upon that state's industry mix. A weighting system can be employed to account for this difference, but it is also useful to track our own improvement over time. This indicator would be complemented by tracking utilization of the state's R&D tax credit, discussed below.



Like private industry investment in R&D, government and nonprofit investment in R&D generates product innovations and expands the knowledge base of government and industries. Public sector and university R&D can be drivers of industry development and growth in a state. It is useful to measure government and nonprofit R&D separately from private industry R&D, since public R&D can be directly controlled by public policy decisions. Comparison to other states is the best benchmark in this area. The data available are not perfect: they exclude or estimate much of the non-federal R&D investment by local nonprofits and state agencies. Yet, this is the best indicator currently available.



Access to startup or expansion financing is key to the growth of firms and industries that drive the New Economy. In addition, the level of venture investment indicates the extent to which venture capitalists view Hawai'i entrepreneurs as worthy of investment. However, looking at investment levels from year to year is not very useful in the case of Hawai'i because investment here consists of a few large deals (typically less than five per year) so a single investment can dramatically affect our ranking and trend. It is more instructive to use a three-year moving average to "smooth out" year-to-year fluctuations and establish a more meaningful trend line. Ideally, the data on venture capital would include investments by small and non-traditional financiers like angel investors, SBICs, state-sponsored funds, private nonprofit financial institutions, and the federal SBIR program (all discussed below). At present these sources of venture capital are not included in the available data.



Calculating the percentage of jobs created by "gazelle" firms measures the degree to which our State economy is composed of new, rapidly growing firms. These high-growth firms are drivers of job creation and builders of new industries in the economy. A series of external shocks to Hawai'i's economy (the Gulf War, Hurricane Iniki, the Asian financial crisis, September 11th) have seriously curtailed business activity and growth over the past decade. Therefore, we would not expect Hawai'i to have many firms that have experienced 20% growth for four straight years, and cannot expect our figures to be comparable to those of other states. (In fact, the U.S. average is 13.8% and Hawai'i easily ranks last among the states). Tracking our own improvement over time with an eye toward a reasonable stabilization level is a more appropriate benchmark.

Findings

Overview: Hawai'i has significant entrepreneurial energy and assets, but needs better supports for and investment in innovative firms and non-tech ideas.

In spite of well-publicized reports on the difficulty of doing business in Hawai'i, our State has a substantial and growing number of successful entrepreneurs. Rated on the basis of new business starts, growth and survival, we fall in the middle of the states at 27th.[47] We achieved this moderate rating in spite of poor rankings in other areas that are key to entrepreneurship and innovation. For instance, private sector R&D is very low as is the level of venture capital investment and small business lending (see below). The number of patents issued per 1,000 workers is also relatively low—we ranked 50th among the states in this area.

We have a substantial and increasing number of successful entrepreneurs and young, growing businesses.

Like most states, Hawai'i's economy is a small business economy: the vast majority of our businesses (92%) are enterprises with fewer than 20 employees.[48] In 2001 Hawai'i ranked 27th among the states for best places to start and grow a business, up from 45th in the nation the year before. The measure is a combination of successful startups and young growing companies, and Hawai'i was the most improved of all the states in both areas. Indeed, the neighbor islands were rated among the top rural areas to do business in the country, breaking into the top 25 rural entrepreneurial "hot spots" among the 90 areas surveyed for the first time since the survey began (again based upon actual business growth and survival). If we look just at new business starts, the picture is the same: we rank 22nd among the states for new business starts overall and 5th for improvement from previous years.[49] These figures suggest that, contrary to popular perception, there is no shortage of entrepreneurial energy and ability in Hawai'i.

Investment in research and development—the fuel of New Economy innovation—is limited, particularly in the private sector.

As previously noted, Hawai'i ranked next-to-last in terms of its R&D investment by private industry. Nationwide, growth in R&D spending has been fueled by industry R&D investment, while public and nonprofit sector R&D has steadily declined. Today, private sector investment in R&D comprises 65% of total, national R&D spending. In Hawai'i, the opposite holds true, with nearly 70% of R&D investment stemming from government, universities and the nonprofit sector. Presently, a very small number of companies invest in research and development in Hawai'i.[50]

On a promising note, part of the State's economic development legislation included a very generous, refundable R&D income tax credit to encourage companies to invest in research and development. The first data on the utilization and impact of the tax credit are expected to be available from the State Department of Taxation in 2003.[51]

Our policies focus on the development of new high-tech firms and not on creating a supportive environment for entrepreneurs generally.

Hawai'i's policies are generally very supportive of high-tech entrepreneurs. PPI ranked Hawai'i 7th in the nation in its study of the "Best States for E-Commerce" largely due to the fact that we have few regulations and taxes that limit e-commerce.[52] The State has also taken significant steps to promote the creation and expansion of high-tech firms.

Specific programs and initiatives also exist to help high-tech companies. Incubators and accelerators like the Manoa Innovation Center, the Hawai'i Health Care Business Incubator, and HiBEAM provide targeted support to tech companies. HiBEAM—a privately initiated nonprofit effort to assist high-tech startups—is currently assisting its first group of five companies and has had some early success in attracting angel investments for these firms.[53] The State also offers targeted help for tech-related small businesses. One State program helps companies seek funding from the federal Small Business Innovation Research Program (SBIR) by providing matching grants and technical assistance. Utilization of the SBIR program has steadily increased over the past few years, and Hawai'i is capturing an increasing share of federal SBIR dollars. Considering SBIR activity during the past five years, Hawai'i ranks 16th among the states in the number of SBIR awards per 1,000 businesses and ranks 20th in SBIR dollars awarded per business in the State.[54] The majority of these awards have been in the area of agricultural research (typically related to bio-tech research) and information technologies. Though limited in size at the moment, these efforts are helping build capacity, human capital and experience for high-tech entrepreneurs in Hawai'i.

When it comes to non-tech companies, however, the State's record on supporting innovation and entrepreneurship is not as encouraging. The Small Business Development Center Network—a State and federally funded network of technical assistance centers for entrepreneurs—experienced significant cuts in funding this past legislative session in spite of consistently high demand for its services. In addition, business costs stemming from state capital gains taxes, general excise taxes, unemployment taxes, electric utilities, workers compensation insurance and property crimes are among the highest in the nation. Indeed, the Small Business Survival Committee ranked our policy environment worst among the 50 states in 2002.[55] Recent legislation exempting royalty, patent, copyright or trade secret income from taxation could benefit all companies in spite of the fact that the legislation targeted high-tech businesses. The results of this legislation have yet to be felt.

Access to capital for young and growing companies may be a limiting factor in entrepreneurial development.

Access to capital is critical for the startup and expansion of innovative firms and the creation of new industries. Unfortunately, the flow of resources from conventional Venture Capital funds is limited to between two and five investments per year, representing just 0.28% of gross state product compared to a national average of 1.47%. Alternative sources of startup financing are also limited. One such source is Small Business Investment Companies (SBIC)—government subsidized equity funds that target small businesses. Hawai'i ranks 48th in both the number of SBIC investments and dollars of SBIC investment as a percentage of gross state product.[56] With the exception of the State's Capital Loan Program, Hawai'i lacks special, social-purpose loan and equity funds designed to grow particular industries or contribute to economic development. Many states comparable in size to Hawai'i have numerous funds, public and private, to promote local economic development.

Bank financing for small business is also in short supply. Each year the Small Business Administration (SBA) produces a report on the Small-Business-Friendly Banks, scoring banks across the country on a scale of 0-100 based upon the number and volume of small business loans as a percentage of total lending and bank assets. Hawai'i banks consistently score in the 50s and 60s. Only four other states have comparably low scores and the national average score is in the 80s. The SBA also provides loan guarantees to encourage banks to lend to riskier small businesses. The number and dollar volume of these SBA-guaranteed loans has declined steadily in Hawai'i over the past three years.[57]

The University of Hawai'i is beginning to assume a significant role in promoting innovation in Hawai'i's economy.

According to the Office of Research Services' 2000-2001 Annual Report, the University of Hawai'i acquired nearly $133,000,000 in grants. Over 90% of this came from outside of Hawai'i. Much of this grant money went to research in important New Economy areas such as Ocean and Earth Sciences ($39 million), Natural Sciences ($22 million), the Cancer Research Center ($19 million), Astronomy ($11 million), the School of Medicine ($10 million), Tropical Agriculture ($10 million), the Pacific Biomedical Research Center ($10 million), and Engineering ($2 million).[58]

Such a large input into the State economy simply cannot be ignored. But beyond the mere cash infusion, university-led research creates knowledge jobs, sparks other innovative activities, and attracts top students to Hawai'i. Perhaps most economically beneficial is the potential for research activity to lead to new commercial activity and subsequent jobs in the private sector. To this end, the messages coming from the University are on the right track. For example, there is renewed direction and enthusiasm in the University's Office of Technology Transfer and Economic Development, where getting research patented and licensed for commercial development has become a clear mandate. Development of the new medical school facility in Kaka'ako also has great potential. As the University continues to pursue its mission to create a world-class institution of learning, it is up to political leaders to facilitate the collaborative pursuit of the public's interest. Government must help create a coordinated environment for society to reap the external benefits generated by the University—good jobs, cultural enlightenment, workforce development, global competence, a culture of innovation and more.

Recommendations

The private sector must lead the way in innovation, experimentation and risk taking. The old economy idea of government-led innovation is infeasible in the fast paced New Economy. In the past, government was more concerned with regulating innovation and directing its benefits to society. While universities tended to be places of teaching and research with no particular economic aims.

Of course, government still has an appropriate role as a catalyst for innovation and a protector of social justice. In the New Economy, all tools are brought to bear on this activity with government acting as an agile spark plug for new ventures. It does this by streamlining necessary business formation processes, making market research more accessible, providing gap funding and services to startups, and stimulating the role of universities in economic development. Again, Hawai'i has taken some good steps in this direction. For example, Hawai'i's credit for R&D investments is one of the highest in the nation. Hawai'i is also blessed with a healthy supply of entrepreneurs. The key now is to take steps to increase not only the quantity of startups, but also their chances for success:

Should do

- Set measurable, achievable and broadly accepted objectives for private R&D investment, including moneys obtained through competitive federal grant programs. A reasonable target might be to encourage private industry to invest $400 million in R&D over the next five years (a level slightly better than our annual average) through incentives and other policy interventions.
- Set measurable, achievable and broadly accepted objectives for rate of business survival in Hawai'i. At present 41% of Hawai'i's businesses were started in the last ten years *and* have survived with at least five employees today.[59] We might aim to increase this figure to 50% of our total businesses.
- Educate more businesses from a variety of industries about the federal SBIR program and other federal opportunities like the Small Business Technology Transfer Research program. Special effort should be made to reach out to industries beyond the mainstay high-tech firms.
- Broaden the policy focus from high-tech businesses to support for innovation and entrepreneurship across all industries, within government and in nonprofits.
- Take additional steps to simplify the process of business startup for entrepreneurs including the integration of government processes for business registration, taxation, employment and specific industry requirements. The current fractured system appears to serve government compartments rather than entrepreneurs.
- Continue to assist university efforts to be a driver of economic growth and innovation while growing its understanding of community needs and desires. This will require smart investments, intelligent marketing and unprecedented amounts of local collaboration.

Ideas to consider

- Take steps to expand access to capital for small businesses, particularly equity investment. This could include expanding publicly funded venture funds, encouraging responsible venture investment by large public funds, or further stimulation of private investment.
- Direct public and nonprofit research and development dollars toward applied research in target industries or fields.
- Provide access to more advanced market analysis and data tools to entrepreneurs—particularly to businesses that need to analyze mainland and global markets.

- Provide assistance for entrepreneurs to obtain affordable health insurance—a significant barrier to business startup.
- Support specific training in business startup, finance, and other business technical assistance to entrepreneurs in economically depressed areas of the State. Build on the finding that the neighbor islands are in the top 25 rural entrepreneurial "hot spots" in the U.S.

Observations and Questions

Getting used to failure: A recent letter to the editor thanks God that the appointees to the High Technology Development Corporation have resigned since "most of these (high-tech) firms are out of business and will be a testament to HTDC failures."[60] No matter how effective or ineffective business assistance is in Hawai'i, one of the real challenges of increased entrepreneurial activity will be living with failure—something that individual entrepreneurs grow accustomed to, but societies often struggle with. In fact, business failure has many silver linings including increased business experience, increased probabilities of future success, quicker movement toward efficient systems and greater amounts of innovation and growth. Hence, PPI uses Job Churning (business success *and* failure) as a measure of New Economy dynamism. However, because of our small size and relatively low amounts of business activity, business outcomes in Hawai'i are broadly reported. It seems as if each new firm or idea is well known—Uniden, SquareUSA, WorldPoint, AdTech, HotU, Pihana, Digital Island, and others. When it happens, business failure in Hawai'i is a public event. It is a business fact that only a few startups become profitable and even fewer will ultimately establish substantial job creating operations in Hawai'i. *What would the public dialogue in Hawai'i look like if we were able to embrace the economic dynamism and risk taking that is inherent in the New Economy?*

Some prototypical early successes: Only time will tell if Hoku Scientific and Hawai'i Biotech become long-term successes or not. But they present good examples of how to start growing. Both are local companies that became part of the portfolio mentored by HiBEAM. Both raised substantial startup capital beginning with SBIR grants. Both also accessed State HTDC grants, local angel investment and venture capital, and non-local investment. Both have benefited from the tax-advantaged investment allowed by Act 221. Both can create synergy with existing local businesses and educational institutions. And both have the potential to create high quality jobs in Hawai'i. Sometimes laws, grants and investments work as intended. *What can we learn from these two experiences to help increase probabilities for success? And what can be done to encourage the creation and support the success of non-tech local ventures?*

Training entrepreneurs: Being an entrepreneur is inherently risky, but it need not be reckless. Many factors can help make good business ideas successful and help keep bad business ideas from ever surfacing. These include good educational foundations, training opportunities, mentoring, access to experienced business people, access to startup funding, access to technical help, and access to potential collaborators. Much has been made about the supports for high-tech entrepreneurs—boot camps, the Kipapa lectures, techie meetings over pizza, HiBEAM and others. The University of Hawai'i College of Business Administration has also made a concerted effort to teach and encourage local entrepreneurship. *How can we increase these activities and broaden topics and attendance to continue nurturing a culture of innovation and business creation?*

Global Competence and Connectivity

Hawai'i has tremendous assets to excel in the global marketplace but it has not yet capitalized on these assets to create a truly globalized economy.

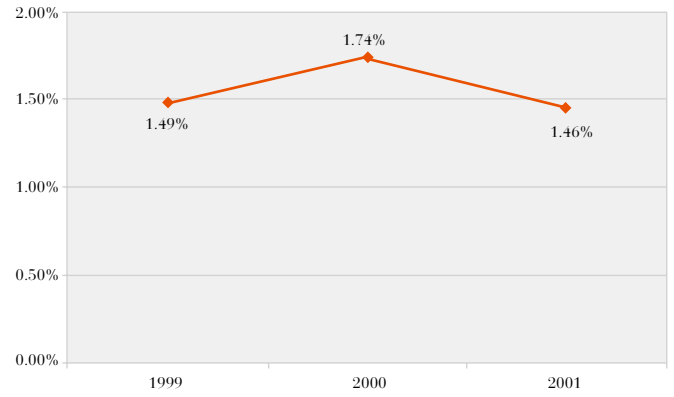
Indicators

Global trade has become an integral part of the New Economy. Manufacturing exports are a proxy for measuring overall export activity, therefore measuring the value of exports per manufacturing worker is a useful indicator of the success a state is achieving in tapping global markets for its products and services. The value of exports will depend largely upon the mix of products being exported and their prices. Due to data limitations, it is difficult to make meaningful comparisons to other states. Therefore, tracking our own trend over time (controlling for inflation) is probably more useful than state rankings. Ideally, we should include service exports in this measure and include only those products made locally (instead of just consolidated, brokered or wholesaled from Hawai'i). Unfortunately, data for this more comprehensive and precise measure are not currently available.

Foreign Business Travel

Percent of all foreign visitors who are visiting Hawai'i for business purposes

Source: Hawai'i State Dept. of Business, Economic Development & Tourism, Annual Visitor Research Reports, 1999 to 2001.

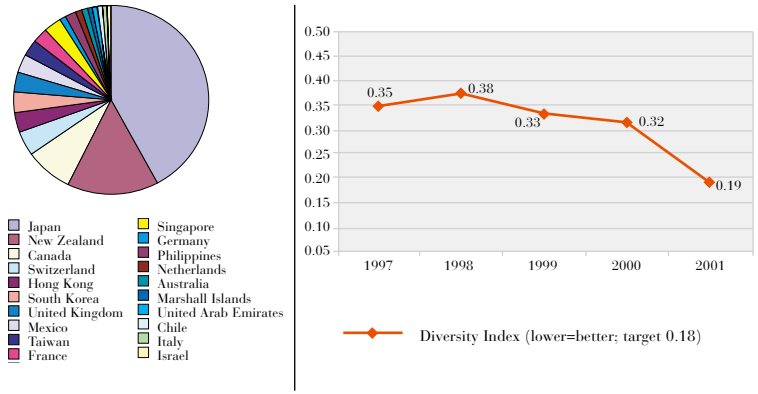


The percentage of foreign visitors traveling to Hawai'i who travel here for business purposes is a good proxy for the level of international business activity in the islands. It also indicates the extent to which the international community views Hawai'i as a place to do business. Tracking our own improvement over time serves as a good benchmark. This measure is not without shortcomings. For one, the level of business travel may be reduced by technologies like teleconferencing, e-mail and the like. In addition, we would ideally capture travel to *and* from Hawai'i, however this information is unavailable. In spite of these shortcomings, for the time being, we believe the measure remains a useful indicator of globalization.

Diversification of Manufacturing Export Market

An indexed measure of the diversity of foreign markets that Hawai'i exports manufactured products to

Source: U.S. Dept. of Commerce, Bureau of Economic Analysis, EL Exports by State and Country, 2001.

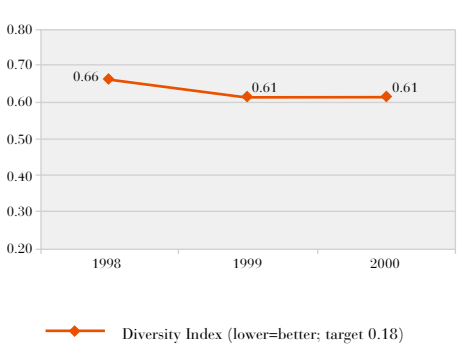


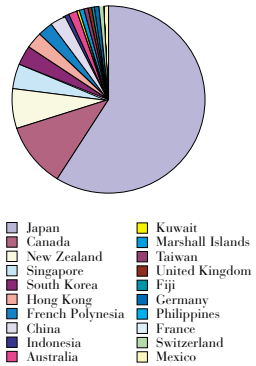
This index measures the extent to which our export markets are geographically diversified. A figure of 0 would indicate a perfectly diversified market—several countries, each with an equal share of exports; a figure of 1.0 indicates a completely undiversified market—a single country taking all exports. The more countries we export to, and the more evenly our exports are distributed across several countries, the lower our figure will be (a lower figure is better on this measure). The diversity of our export market is a good measure of the extent to which the market for our products is truly global. Furthermore, as we export to a greater number of countries we insulate ourselves from country-specific economic risks. Ideally, we would add exports of services to this measure to get a more complete picture of export activity. However, as previously noted, this information is currently unavailable.

Diversification of Visitor Market

An indexed measure of the diversity of visitors by country of origin

Source: Hawai'i State Dept. of Business, Economic Development & Tourism, Annual Visitor Research Reports, 1999 to 2001.





The fact that Hawai'i is a world-class visitor destination would seem to suggest that we are successfully globalized, at least in terms of our visitor industry. This indicator attempts to quantify that claim, measuring the extent to which our visitor industry is reaching a global market beyond the one or two countries that comprise the vast majority of our visitors. As with Diversification of Manufacturing Exports, a lower ratio reflects more diversification and a higher ratio less diversification. This indicator is the true measure of how well we are reaching a global market with our visitor products and services.

Findings

Overview: Hawai'i has well-known assets to build a strong position in a global economy, but we have not yet become a global state.

Hawai'i's unique assets include a culturally and ethnically diverse population with strong foreign language capacity, a good number of foreign visitors who come for business and education as well as for pleasure, and geographic proximity to a variety of markets around the Pacific Rim. Furthermore, we have the participation of foreign-owned companies in our local economy (for better and sometimes for worse) and a decidedly global outlook, with policy makers that effectively visualize Hawai'i as a globalized state. Still, we have yet to tap these resources to reach the global markets we are capable of reaching. Even our world-class visitor industry is primarily dependent upon visitors from one country (Japan) and our educational and business institutions have not established themselves as the preeminent links to Asian countries that they could be. In short, we have failed to convert our global assets into global results.

For years, our policy makers have spoken about the need for Hawai'i to become a more active player in the global economy and have taken some steps to promote our globalization. For example, Former Governor Cayetano recently signed an agreement with the Chinese government to provide training to government officials and business executives.[61] Hawai'i can benefit by continuing on this course in a strategic fashion to ensure that Hawai'i is actually gaining from these global exchanges of money, goods, information and knowledge.

We are not collecting the appropriate data to effectively measure Hawai'i's participation in the global economy.

The indicators available to track Hawai'i's globalization leave much to be desired. Ideally, we would measure total export activity, including products, knowledge and services; the exchange of ideas and management practices with other nations; foreign investment that benefits Hawai'i companies and workers; and the ability of our workers to operate in a global marketplace. However, as in the area of workforce education, our current globalization measures are better suited to monitoring old economy activities than New Economy ones. We track shipments of goods that are manufactured or grown not the movement of ideas and services which are the products of the New Economy. Other measures, like Foreign Direct Investment are inappropriate because they mostly capture an activity with mixed impacts on our economy and our quality of life (See explanation in the Technical Appendix). The result is that we know little about the kind of globalization that matters most to Hawai'i.

We are making progress toward diversifying our export market.

Hawai'i has made significant strides in diversifying its export market in recent years. In 1997 we exported goods to 74 countries; by 2001 we had increased that number to 96. Five years ago, more than 83% of our exports were to five countries—Japan, New Zealand, Singapore, Canada and South Korea. But, by 2001, these same countries accounted for only 67% of our exports.[62] In recent years, then, we have successfully spread our exports across a greater variety of countries and markets. It also appears that we are successfully shifting exports from old economy to New Economy products. Between 1997 and 2001, the biggest gains in exports came from Computers and Electronics, Transportation Equipment, Beverages, Miscellaneous Manufactures and Special Unclassified items. Apparel, Crops and Wood Products—all old economy industries—were among the sectors that lost the most ground.[63]

Our visitor industry is not successfully tapping a diverse set of global markets.

While we have made significant progress in globalizing our exports, we have largely failed to globalize our visitor industry. In spite of the fact that we are considered a world-class and world-renowned destination, 90% of our visitors still come from the U.S., Canada and Japan. No other country accounts for more than 1.5% of the total annual visitor count. What's more, no encouraging trends are apparent. The percentage of visitor spending from Japanese, Canadian and U.S. visitors has hovered at or near 90% for more than a decade, declining only slightly since 1990. Between 1998 and 2000 the portion of expenditures from these three countries actually increased from 86.8% to 89.2% of total visitor spending. One promising sign is that the portion of visitors traveling to Hawai'i on business has increased over the past ten years, suggesting that we may be gaining stature as a place to do international business as well as vacation.[64] Still, the evidence suggests that we are reaching only a fraction of the global market that we could.

Recommendations

Before the world got so small, interstate and international commerce was led by government-sponsored delegations. We often think of an international mission as a way of opening doors for trade of goods, services and knowledge. While there is still much for governments to do, this way of thinking is becoming passé.

In the New Economy, we must view every resident and visitor as an ambassador for Hawai'i. No government can hope to manage the numerous transactions that take place in a global economy. Hence, to ensure a net gain in global trade, public and private sectors must help create collective global competence. This can be done by growing the number of international contacts, thinking of internationalism as a core competence and disseminating information about global markets and foreign consumers. Just as Hawai'i's tourism industry had an organic ability to adapt to the Japanese market, we now need a larger more coordinated effort to adapt to the New Economy. Immediate steps could include:

Should do

- Start measuring service export activity. The Department of Business, Economic Development and Tourism already compiles a list of engineering, environmental and energy services exporters. This list could be expanded and a survey conducted to capture all service export activity.
- Set measurable, achievable and broadly accepted objectives for diversifying our export market that accounts for both total export volume and diversity of the export markets reached. A good goal is to achieve an indexed diversity measure of 0.18 or less—the level of market diversity that federal agencies use to define the cutoff point between a highly concentrated versus diversified market.[65]
- Set measurable, achievable and broadly accepted objectives for diversifying our visitor market that account for both total visitor volume and diversity of the visitor markets reached. As in the case of diversifying our manufacturing exports, a good goal is to achieve an indexed diversity measure of 0.18 or less.
- Carefully assess economic environments around the world and identify nations that have assets and needs that integrate well with Hawai'i's economic strategy.

Ideas to consider

- Provide assistance for the travel industry to reach into new international markets—particularly those with significant non-tourism related economic upsides and which could be future economic partners.
- Support foreign language and foreign study programs in schools, universities and employment settings.
- Provide support for new immigrants wishing to start businesses. New immigrants committed to their new homes may be a significant spark for international commerce and understanding.
- Create a State office of international relations. The office should be accountable for tasks such as tracking international policy and its impacts on Hawai'i, monitoring important international events and groups such as Asia-Pacific Economic Cooperation (APEC), learning from and encouraging international activities of businesses, nonprofits, and academic organizations such as the East-West Center, and advocating Hawai'i's positions to federal policy makers.
- Support international conferences and events that lead to the exchange of goods, services, ideas, and cultures.

Observations and Questions

Globalization post 9-11: The events of September 11 changed the world. How do these changes affect Hawai‘i? Much is being made of the effects on travel and tourism. But merely figuring out how to get people back in airplanes is a shortsighted view for Hawai‘i. There are many other questions worth asking. *How does 9-11 affect our choice of countries to approach in order to diversify tourism and exporting? What will be the economic impact on Hawai‘i of a possible world energy crisis? How do events on the Korean peninsula affect Hawai‘i? Given the impact of increased security measures and possible increases in military action, are there any ways that Hawai‘i can stay informed of or even influence international affairs? How can Hawai‘i contribute to international studies, religious and cultural understanding, and world peace?*

Looking beyond Japan: The U.S. Department of Commerce projected a 21 percent increase in Japanese visitors to America by 2006. It also predicted growth rates of 24 percent from Taiwan, 27 percent from Hong Kong, 46 percent from South Korea, and 54 percent from China.[66] Perhaps many of these visitors will be coming to Hawai‘i along with countless others from outside the Asia-Pacific region. *What is Hawai‘i doing to capture its share of these markets and prepare its people to relate, interact, and transact business with people from so many different nations? Or will this diverse array of visitors simply bypass Hawai‘i?*

How anyone can go global: After a brief spot on CNN, the Hawai‘i-based company Hawaiian Organics now sells its Body Mint product worldwide with distribution contracts reaching Korea, China, Ecuador, Canada, Puerto Rico and Dubai. CNN found an article about Body Mint on the Internet and soon, orders for Body Mint rushed in through their website.[67] Commercial Roofing & Waterproofing Inc. went global in a more traditional way. The president of the local company flew to the Philippines and worked hard to establish relationships and a viable operation.[68] *How can everyday small businesses be assisted in going global and what helps create a society unafraid to meet the challenges of international trade?*

Making Hawai‘i global is not all business: Global competence and connectivity is a learning process. It is about human experiences of gaining knowledge, understanding, comfort, and trust. As such, many existing activities are helping to bridge cultures. Some examples: The Hawai‘i International Film Festival recently focused on Korean filmmakers and has formed a partnership with the Shanghai International Film Festival;[69] the University of Hawai‘i has decided to offer a Master in law for foreign law students;[70] and Hawai‘i recently hosted an international conference on human trafficking.[71] All these activities help establish Hawai‘i as a setting that is content rich as well as aesthetically pleasing. *How can Hawai‘i also nurture interest and competence in international matters among the non-conference going majority of the population?*

Hawai‘i’s Institutions in the New Economy

The waves that crash onto our beaches provide us with a perfect analogy for the New Economy. Just as the crush of the ocean is too powerful to stop, it is equally futile for Hawai‘i to try to deny the changing forces of the world’s New Economy. With a big wave, there is only one conscious option to choose—to use skill and determination to ride it safely and happily into shore. Otherwise, nature exercises its control by tumbling a person helplessly beneath the surface. So too with the New Economy, Hawai‘i can either act boldly or be inevitably acted upon.

In this section, we talk briefly about ways Hawai‘i can and must take action. We begin each subsection with a scenario of what may happen if we let an institution be pummeled by the New Economy wave. We then suggest purposeful transformations that could help Hawai‘i succeed in the New Economy. These transformations will require substantial and sustained leadership within the public and private sectors.

It is no small feat that Hawai‘i’s recent New Economy legislation, spurred in part by the 1999 PPI Report, has been recognized as one of the most far reaching in the country. But in the fast paced world of the New Economy, these legislative moves will seem incremental when compared to the broader societal evolution that will take place.

QUALITY OF LIFE

Under the wave: Despite years of believing Hawai'i is paradise, the quality of life will become increasingly inadequate to attract and retain the drivers of New Economy activity. The State has claimed to have an "unfair recruiting advantage" which it will market to prospective high-tech businesses. The State is touting its "clean environment, top quality healthcare, low crime rate, state-of-the-art telecommunications infrastructure, world class educational institutions and the 'Aloha' spirit" as reasons why businesses will attract the most qualified workers.[72] Even if we assume those quality of life items were true, Hawai'i's weaknesses in other areas—public education, growing income disparity, public works infrastructure, traffic, cost of living, and low civic participation to name a few—will dissuade workers and employers from relocating to Hawai'i and pressure homegrown talent to leave. Even our strengths will deteriorate as other locales implement new technologies and policies to protect their environments and as new economies emerge in nations with more vibrant communities and talented workers. Businesses and individuals will consume subsidies and bonuses offered to attract them to Hawai'i and then quickly depart leaving nothing behind.

Riding the wave: Instead, Hawai'i must understand that in the New Economy, "other issues" such as crime, education, public works, the environment, housing, poverty, culture and the arts, and transportation, are in fact *economic* issues that can drive economic success. No amount of marketing can shroud deficiencies in these areas. These improvements will take considerable resources and in some cases, transformations of some of the institutions described below. At the same time, they must be balanced against thoughtful efforts to maintain a Hawai'i for Hawai'i's people. While some efforts may be targeted at attracting business, expertise, investment and skilled workers from outside Hawai'i, we should focus even more of our efforts to understand what it will take to cultivate homegrown talent and to provide for their quality of life needs to keep that talent here in Hawai'i. Everyone in Hawai'i must participate in this transformation.

GOVERNMENT

Under the wave: The New Economy places higher standards on government. If Hawai'i does not transform government, it will continue to see disturbing trends. Fewer people will participate in government and it will be increasingly less representative of the people's will. Because of its poor image and inefficiency, government will struggle to find good people willing to work in civil service or to run for elective office. People and companies lured to Hawai'i with subsidies and incentives will leave out of frustration with our policies, politics and bureaucratic requirements. This high level of cynicism will lead to more government incompetence and irrelevance.

Riding the wave: Instead, Hawai'i must transform its government with New Economy principles. It must itself become highly competent and organized, technologically infused, globally connected and a place for continued learning by employees. Instead of trying to lead and manage all social change, Hawai'i's government needs to hone its skill as an effective facilitator of change, a fair arbiter of interests, a credible convenor of stakeholders, and a powerful opener of doors for citizens and businesses. Government must also be more accountable and responsive to citizens, leading to increased confidence and participation and a greater ability for public institutions to meet the "market demand" for social order and public goods. This transformation is squarely in the hands of political leaders and government officials at all levels.

INSTITUTES OF HIGHER LEARNING

Under the wave: The New Economy can force institutions of higher learning into a rapid decline. Universities and colleges will be expected to prepare people for New Economy jobs and be an economic driver. This creates numerous dilemmas of taking resources from some key areas to buttress others. Soon it is clear that no areas seem adequately financed—faculty salaries, physical facilities, instructional materials, student aid, alumni development, grant seeking activities, research and development. Competition for scarce resources unravels into a downward spiral. If we wait idly as the New Economy strikes, we will see fewer strong students in Hawai'i, and more people reaping Hawai'i's unique learning experiences—such as ocean sciences and astronomy—and taking the benefits elsewhere. There will be continued threats to accreditation and general community confidence.

Riding the wave: Government, university leaders, faculty and students must lead a courageous transformation; courageous because it will likely require strategic redirection of resources and changes to traditional roles. Higher learning will have to become an economic driver, an engaged community member and a leader of global understanding. All the while, colleges and universities will have to continue improving on their role as a provider of educational opportunity and advancement. We already see a willingness to assume these roles—researchers are tackling community issues, public and private universities are touting their international appeal, and applied technologies are being brought to market. Institutions must continue to debureacratize, reallocate resources, and make difficult decisions in the right ways. Where Hawai'i once prided itself on making higher education accessible to so many, we should soon base our pride in the degree to which our institutions are progressively integrated into our economy, our communities, our public leadership and our culture.

EDUCATION

Under the wave: Simply put, if Hawai'i's education system continues on this trajectory, it will fall far short of where it needs to be in the New Economy. The pace of change and innovation in the education system is far too slow to accommodate the changing world. The recent Felix Consent Decree compliance efforts have uncovered and in some cases made worse the deep institutional and bureaucratic problems. Compliance with the No Child Left Behind Act will be no less trying. Despite successful efforts to place computers in schools and a high societal value on educational attainment, our education system lacks the capacity and flexibility to adequately prepare young people. New graduates ready for specific jobs will have obsolete skills before they know it. The costs of retraining workers may be unbearable. It will be increasingly difficult to find qualified local talent for higher paying jobs. School reforms such as Hawai'i's performance standards and charter schools will seem like mere tinkering in retrospect as expectations of educational systems skyrocket. Furthermore, the disparity in private and public school outcomes will continue a dangerous stratification of income and class.

Riding the wave: It will take an effort of epic proportions to transform public education in Hawai'i, as it will across the U.S. But we must start in that direction if we are to provide bright futures for our population. Teachers, administrators, parents and students must be brought into a conversation about the changing goals of education. Whether we like it or not, traditional K-12 education is becoming passé. Instead of resisting, we will need to think about the new set of fundamental skills that all citizens should be able to learn in public schools. Expectations of all must be higher than ever. Besides the usual suspects—government, school administrators, teachers, parents and students—private schools, universities and businesses will also have important roles in this transformation.

UNIONS

Under the wave: As the New Economy comes, unions who fail to transform will be under intense internal and external pressures. A decreasing membership trend will continue regardless of Hawai'i's success or failure in the New Economy. In a successful New Economy, more people will find higher wages and benefits in non-union employment. In an unsuccessful New Economy, unions will be unable to support the increasing numbers falling into long-term unemployment. Despite a tradition of positive social impact, unions will be increasingly criticized as institutions that hold up progress. Political clout will decrease as will the ability to provide needed services and advocacy for members.

Riding the wave: Unions need not wait for the New Economy to swallow them up, but they do have to make concerted efforts to craft new roles. Because the economy is changing, the needs of members are also changing. Instead of job stability, unions in the New Economy can provide value to members by assisting with job advancement through services that enhance personal development and mobility. Unions that take a less protective posture will serve members by providing access to lifelong learning, developing new skills and competencies in computers and technology, and improve quality of life measures for workers. Like all other institutions, unions will have to infuse themselves with technology to run efficiently and effectively—HGEA's website provides a shining example of a union becoming tech infused.

Obviously there are critical roles for HSTA in transforming public education, UHPA in transforming the University of Hawai'i, HGEA in transforming government, and private sector unions in transforming business. Each union has immediate power it can wield. But sustained political clout will come with each union defining its unique role in the New Economy. Unions who represent lower income sectors will be critical for minimizing income disparities and providing much needed advocacy. Unions that enhance worker skills will be indispensable to business and government. Unions with large immigrant memberships can play a key role in improving global competence. Unions that are flexible, retain members, and gain new membership from New Economy sectors will reestablish credibility in the general public and be a continuing political force.

BUSINESS PRACTICES

Under the wave: The worst-case scenario for Hawai'i business in the New Economy is simple. Hawai'i businesses will be unable to compete with foreign owned businesses. It will be continually difficult to recruit and retain high skilled workers and compete with non-Hawai'i companies on value and price. With more access to markets, consumers will start buying more from outside Hawai'i than from within.

Riding the wave: Local businesses must transform to be competitive. In doing this, they may find themselves more involved in public affairs than ever before. Cooperation with public agencies and community organizations will prove more economical than the resources needed to resist them. Businesses must play a key role in upgrading the workforce by providing access to training and personal development. They must also revise outdated organizations to encourage new ways for employees to make decisions and problem solve to improve production. Of course, businesses must also make smart decisions to invest in technology applications to enhance efficiency. Businesses will also help drive a new culture of innovation and entrepreneurship by investing in research and development and collaborating with universities and governments. Finally, smart business will increase community investments for improving quality of life indicators in the community at large.

SOCIAL SERVICES

Under the wave: Social service agencies also run the risk of being swallowed by the New Economy. Privately interested entrepreneurial firms will be able to provide many services more cheaply and of higher quality and people will flock toward them despite the negative effects these will have on access, equity and fairness. This will create even greater strains on traditional agencies to serve growing populations that must be fully subsidized. Competition for grants will continue to grow fierce as needs increase and resources shrink. Those who relied on a paradigm of charity will be unable to stay afloat. The subsequent human suffering will be unbearable.

Riding the wave: Social services are beginning to understand their important function in Hawai'i's economy. As employers, providers of goods and services, and businesses, they too must transform to accommodate the New Economy. Government, philanthropy and communities must help this sector along this path. Nonprofit agencies must grow in capacity, adopt new technologies, innovate, and obtain global expertise. They must be able to invest in their employees and provide wages and challenges comparable to the evolving for-profit sector. Traditional sources of funding need to help make this happen. A New Economy social service sector will implement new methods of tracking progress and measuring outcomes. If given appropriate resources, these agencies will be responsive, flexible and innovative to adapt to changing community needs.

University of Hawai'i
Biomedical Research Center
John A. Burns School of Medicine

UNDERSTANDING WHO WE ARE

Under the wave: Nothing is more fragile in the New Economy than tightly held beliefs and principles related to who we are as a people and as a place. New Economy success threatens Hawai'i just as much as New Economy failure does. Those who think that tourism posed a threat to the "Aloha Spirit" will certainly fear the New Economy. Increased mobility will change the composition of our population and culture. Diversity could be lost. Self-determination would be undermined by increased foreign ownership and influence. Environmental degradation will increase with overcrowding. A sense of place will be threatened by worldwide conformity.

Riding the wave: In the midst of transforming our economy, it will be up to everyone to maintain those things that we hold dear. Leaders in all settings will have to identify needs and balance priorities to continually define Hawai'i's identity. Cultural practices, the arts, family ties, and community involvement will help. We will need to be mindful of those quality of life measures that are not directly associated with wealth and gain a more conscious understanding of the price we are willing to pay to "keep Hawai'i, Hawai'i." Also important will be our ability to forecast the impact of our actions and to manage our expectations with a picture of what we do not want to become that is just as vivid as the picture of what we want to become.

Conclusion

It is pointless to debate whether the New Economy should give us hope or scare us senseless. But it is important to note that there are good arguments on both sides.

Let's begin with fear. Hawai'i's economic policy has lacked a coherent strategy and our rate of economic transformation has been uninspiring. At stake is nothing less important than our way of life and the future for our children. Hawai'i is in no position to turn back global economic realities. Until we are riding the New Economy wave, we will founder in our own frustration and long for visions of a Hawai'i that has long past us by. The New Economy seems more likely to do something bad to our islands than good. Unfettered economic growth threatens our environment, our culture, our diversity, and our spirit. Continued economic failure offers the same in the form of a continuing brain drain, hopelessness and social unrest.

Let's end with hope. Hawai'i has taken some of the first steps toward successfully navigating the New Economy. Hawai'i is also beginning to undertake some of the major transformations needed to achieve its social goals in the New Economy. Through listening, learning, and leadership, Hawai'i can effectively create high-tech industries, infuse technology into all aspects of society, accommodate new modes of work, foster a culture of innovation and become globally competent. The prizes that await are substantial—unprecedented levels of quality of life, of promise for future generations, of cultural awareness and identity, of social justice, of individual opportunity and of civic engagement.

In this report we presented the defining characteristics of the New Economy, ways to measure Hawai'i's progress in those five areas, a status report of where Hawai'i stands along with its strengths and weaknesses, a list of possible next steps, and guidance on major reform. It is now time for the inspired work to begin.

Technical Appendix

This Technical Appendix provides some additional detail on the methods used to derive state rankings, trends, and statistics used in the Indicators sections of the report. It focuses on explaining those indicators that required some technical analysis including new indicators that were not used by PPI and PPI indicators that we modified in ways that require explanation. Even where we used PPI's indicator and methods, we often advocate for tracking trends, which required collection and analysis of historical data. This process, too, requires some explanation as data collection practices and definitions change over time (see, for example, High-Tech Jobs). We also briefly explain those indicators that PPI uses in its State New Economy Index, but which are not appropriate for Hawai'i. These may be useful for some states—even the vast majority of states—but for reasons explained later they are actually poor and sometimes deceptive measures of New Economy progress in Hawai'i.

This Appendix does not discuss all indicators individually. Excluded from individual treatment are indicators that are relatively straight forward in their calculation (e.g., Broadband Access, Gazelle Jobs and Foreign Business Travel).

NEW ECONOMY INDICATORS FOR HAWAI'I

	HIPA	PPI
Rank	46	46
HI%	1.9%	2.0%
US%	4.2%	5.3%

Reason for difference: Although PPI's data sources, industry definitions, and methodology were replicated, HIPA calculations yielded different results. State rankings were unaffected.

High-Tech Jobs: We attempted to replicate PPI's method for this indicator taking their definition of "high-tech" and using their cited data sources, however, our calculations yielded different results. PPI listed their definition of "high-tech" as including 56 different industries under the Standard Industrial Classification (SIC) system of industry definitions[73] and their data source as the Census Bureau's County Business Pattern (CBP) reports. CBP data for years after 1998 is only listed according to the new North American Industrial Classification System (NAICS, versus the older SIC system). It was thus necessary to "cross-walk" definitions, matching the old SIC industries that PPI used with new NAICS industries using a bridging guide issued by the Census Bureau.[74] In many cases this required splitting the jobs in a single SIC industry among two or more NAICS industries.[75] In industries comprised of only a few firms, CBP lists employment data in ranges (e.g., 0-19 employees, 100-149 employees) rather than as exact figures to protect confidential information about specific companies. In such cases, we used the midpoint of the range as our estimate of actual employment. We then totaled employment in all high-tech industries and divided by the total number of civilians employed derived from the Statistical Abstract of the United States. Although our analysis yielded different figures for the percent of total employment in high-tech industries, the difference did not affect Hawai'i's ranking, which remained at 46.

Scientists and Engineers: We replicated PPI's method of measuring the portion of the workforce comprised of scientists and engineers. The count of scientists and engineers is taken from the National Science Foundation Science and Engineering profiles. These figures are gathered via nationwide survey once every two years. NSF excludes military scientists and engineers which helps to control for a large number of military scientists in some states. These counts were divided by total employment in the appropriate year, taken from the Bureau of Labor Statistics, Seasonally Adjusted, Total Non-Farm employment counts.

IT Jobs in Non-IT Industries: We replicated PPI's method for this indicator, taking total IT employment from the U.S. Bureau of Labor Statistics, Occupational Employment Survey then subtracting estimated IT employment in IT industries to yield a figure representing only IT employment in non-IT industries. PPI did not list its estimate of the share of IT employment in IT industries. However, based upon the adjustments that PPI made to total IT employment, we determined that PPI estimated that nationally, 39.6% of IT employment was in IT industries, and that in Hawai'i, 29.7% of IT employment was in IT industries. We subtracted these portions from total IT employment to yield the number employed in IT positions in non-IT industries. We divided these figures by total civilian employed from the Statistical Abstract of the United States to calculate the share of total employment.

	HIPA	PPI
Rank	38	40

Reason for difference: For consistency, simplicity and replicability, HIPA chose to report the rank from one study on digital government. PPI's unique ranking comes from its own scoring system.

Digital Government: PPI drew from two separate data sources to determine Hawai'i's rank of 40th in this area: a survey of state CIOs by the Progress and Freedom Foundation (Hawai'i ranked 38th), and a Brown University analysis of state government websites (Hawai'i ranked 37th). The two sources use different methods of assessing the 'digitization' of government. The Progress and Freedom Foundation survey asked specific questions about the deployment and use of technology in government agencies. The Brown University analysis looked at the sophistication and particular features of government websites to determine the extent to which services have been brought online. Because the Progress and Freedom Foundation examined deployment of various technologies in addition to web-based services, we chose to use their ranking rather than Brown University's.

Commercial Domain Names: We attempted to replicate PPI's method for this indicator. However, it was unclear how PPI derived the "total firms" figure that serves as the denominator in the calculation of domain names per firm. When we used the source PPI cited—Cognetics' Corporate Almanac—our results differed slightly from PPI's. We could find no source of comparable, reliable data on total firms over time. Therefore, the trend chart shows only the raw number of domain names over time

Online Population: We replicated PPI's analysis of this indicator. We used the same data source that PPI uses for their indicator—a U.S. Department of Commerce study on Internet usage in households. The study lists data on the percent of the population ages three and older who are Internet users, but lists only estimated ranges. For example, the percent of Hawai'i residents who are Internet users is between 47.6% and 54.1%. Like PPI, we used the midpoint of the range as our estimate of the actual percentage of the population who are Internet users. When states were ranked according to the midpoint of their range, Hawai'i ranked 40th.

	HIPA	PPI
Rank	17	10
HI #	52.2	53.3
US #	51.2	49.2

Reason for difference: PPI last reported using 2001 CPS data, HIPA uses the most current 2002 data. There may also be slight variations in the manipulation of source data.

Educational Attainment of the Workforce: We used PPI's method of measuring and ranking educational attainment. The percentage of residents with more than a high school degree but no four-year college degree is weighted with a multiplier of 0.5; college degrees with a multiplier of 1.0; and graduate degrees with a multiplier of 2.0. The weighting system presumes that more advanced degrees are more valuable to the New Economy. Source data comes from the Current Population Survey, a nationwide survey conducted annually by the Bureau of Labor Statistics.

	HIPA	PPI
Rank	41	44
HI%	23.4%	23.0%
US%	25.8%	26.5%

Reason for difference: PPI does not list which 22 occupations it chose to belong in this category, so its methodology cannot be duplicated. HIPA applied the same logic to come up with similar numbers.

Managerial, Professional and Technical Jobs: We attempted to replicate PPI's analysis in this area, however its definition of 22 "managerial, professional, and technical" occupations could not be determined. Based upon PPI's narrative description of the definition it used, we developed a comparable definition of "managerial, professional and technical" jobs which included 8 major occupational groups comprised of 242 occupations within the Standard Occupational Classification (SOC) system used by the Bureau of Labor Statistics', Occupational Employment Survey (the source of all data for this indicator). The 8 major groups were Management Occupations (SOC 11-0000), Business and Financial Operations Occupations (SOC 13-0000), Computer and Mathematical Occupations (SOC 15-0000), Architecture and Engineering Occupations (17-0000), Life, Physical and Social Science Occupations (19-0000), Legal Occupations (12-0000), Education and Training Occupations (25-0000), and Healthcare Practitioners and Technical Occupations (29-0000). Based upon this definition, total managerial, professional, and technical employment was calculated for each state and the nation as a whole. Final figures and rankings differed slightly from PPI.

	HIPA	PPI
Rank	45	26

Reason for difference: HIPA chose to use different variables than those of PPI, focusing on inputs and outcomes of importance to Hawai'i.

Technology in Schools: We used the same source data as PPI for this indicator—the National Assessment of Educational Performance—but used different variables from the NAEP to measure our progress. We chose five variables that were most closely aligned with Hawai'i's desired outcomes or important inputs closely tied to those outcomes. These included (1) the number of students per instructional computer in the state, (2) the percent of classrooms with Internet access, (3) the percent of schools where at least half the teachers are beginners at using technology, (4) the percent of schools where at least half the teachers use computers daily for planning or teaching, (5) the percent of schools where at least half the teachers use the Internet for instruction. Each of these NAEP measures was scaled on a 0-100 basis (with a total possible score of 500), and each state was scored and ranked based upon these five variables.

Successful Startups: This measure is taken from a study conducted by Cognetics, Inc., titled "Entrepreneurial Hot Spots: The Best Places in America to Start and Grow a Company." The study, conducted annually, ranks states according to their successful startup rate. The measure is a combination of: 1) "significant starts"—firms started in the last ten years that employ at least five people today as a percentage of all firms; and 2) "young growers"—the percentage of firms four years ago that were ten years old or younger, that grew significantly during the last four years. Cognetics combines these measures to create the final index and ranks states, metropolitan areas, and rural areas based on the measure. This indicator does not appear in the PPI Reports.

	HIPA	PPI
Rank	50	40
HI #	0.13	0.36
US #	0.60	0.80

Reason for difference: Although the same data was used to calculate HIPA and PPI numbers, PPI also employed a weighting system to control for different industry mixes in different states. Because the methodology is not apparent, the PPI numbers were not replicable. HIPA reports unweighted numbers and got similar relative results.

Patents: We used the same source data as PPI's in calculating the number of patents per 1,000 workers and Hawai'i's ranking among the states. Because some industries are more predisposed to patenting activity than others, PPI controlled for different industry mixes in different states by adjusting scores. For example, a state with a large biotech sector (with high propensity to patent) would have its score adjusted downward to account for the fact that it has a large industry with high propensity to patent, placing it on equal footing (in terms of its patent score) with a state with most of its economy in manufacturing (see Endnote 3 in the PPI Report for additional detail). We use the simpler unweighted measure for more ready replication.

	HIPA	PPI
Rank	49	49
HI %	0.04%	0.11%
US %	1.69%	1.91%

Reason for difference: PPI's rationale and method were sound, but could not be replicated due to lack of detailed description in the PPI report. As with patents, PPI used a scaling factor to control for different industry mixes in different states. HIPA used the same raw data, but did not attempt to control for industry mix.

Industry Investment in R&D: We replicated PPI's methodology in our treatment of this indicator, taking data from the National Science Foundation, National Patterns of R&D resources—a study conducted once every two to three years. Because different industries have different propensities to invest in R&D, PPI attempted to control for the effect of different industry mixes in different states by correcting for R&D skewed by the presence of an industry in a state (like biotech) with very high (or very low) propensity to invest in R&D (see the discussion of Patents, above). Adjusted R&D figures were then divided by total gross state product—a measure of total output by all industries and sectors in a state. For easier replication, we used the same data as PPI, but used the raw data rather than attempting to control for industry mix. We found that using raw data did not yield rankings that were significantly different from PPI's ranking. Total industry R&D was divided by the GSP and GDP for the appropriate year.

Government and Nonprofit Investment in R&D: This measure was included in our report because R&D investment by government, colleges, universities and nonprofit organizations represents a significant portion of total R&D investment in Hawai'i and the U.S. Because propensity to invest in R&D do not vary by "industry" in the same way private R&D investment is, no adjustments to the data were attempted. Total R&D was divided by total gross state product to yield the final figure. This indicator does not appear in the PPI Reports.

	HIPA	PPI
Rank	41	21
HI %	0.28%	0.48%
US %	1.47%	1.10%

Reason for difference: PPI calculates percentages on an annual basis. HIPA calculates on a three-year moving average because it will smooth out fluctuations for small states like Hawai'i.

Venture Capital: We used the same data sets as PPI but used a three-year moving average to establish a smoother trend. If not, small states will likely find dramatic shifts up and down the rankings due to a very small number of VC investments.

	HIPA	PPI
HI $	$24,848	$34,699

Reason for difference: As with patents and industry investment in R&D, PPI uses a weighted measure attempting to control for industry mix.

Export Focus of Manufacturing: We used the same data for this measure as PPI. However, the PPI weighting system was not replicated, because tracking Hawai'i's trend over time is the most important benchmark for this indicator.

Diversification of Manufacturing Export Market: This measure uses an indexed ratio to measure the extent to which our markets are diversified. The ratio, officially known as the Herfindahl Index, is used by the Justice Department to monitor markets for monopolistic activity. In essence, the index is a measure of how concentrated or diversified a market, industry, or group of industries is. It is calculated by taking each competitor or customer's share of the total market, squaring it, and then summing the squared shares. In the case of Hawai'i's export market, the index is calculated by taking each country's share of Hawai'i's total exports, squaring each share, and then summing them. Markets with an index value below 0.18 are considered "moderately concentrated", whereas those with an index value above 0.18 are "highly concentrated" and cause for concern. Source data on exports by destination country comes from the U.S. Department of Commerce, Bureau of Economic Analysis, EL Exports by State & Country reports. This indicator does not appear in the PPI Reports.

Diversification of Visitor Market: As with diversification of exports, this indicator uses the Herfindahl index to measure the diversification or concentration of our visitor industry. In the case of Hawai'i's visitor market, the index is calculated by taking each foreign country's share of the total visitor count (e.g., Japan, 73%; Canada, 9%; Korea, 2% of total visitors), squaring each country's share, and then summing these figures. Again, markets with an index value above 0.18 are "highly concentrated" and cause for concern. Source data on visitor counts comes from the Hawai'i State Department of Business, Economic Development & Tourism, Annual Visitor Research. This indicator does not appear in the PPI Reports.

2002 PPI INDICATORS THAT WERE NOT USED

Online Manufacturing: Tracking the percentage of manufacturers with online access provides some sense of the extent to which even old economy industries are adopting New Economy technologies. Manufacturing is a large part of the economic base in most states and a key source of high-wage, semi-skilled employment. Hawai'i happens to rank 48th at 72.7% with the U.S. average being 84.5%. This is a relevant indicator in most U.S. states where manufacturing is a substantial share of total employment. However, it is not particularly relevant in Hawai'i where manufacturing is a very small part of the local economy (under 4% of total employment in Hawai'i compared to 18% nationwide). We therefore recommend that it not be used to gauge Hawai'i's New Economy performance.

Online Agriculture: The extent to which farms have adopted use of the Internet and computers indicates whether the local economy is becoming technologically infused, particularly since farms are typically "old economy" establishments. The indicator would be especially relevant in the Hawai'i context where we have a significant number of rural communities and because diversified agriculture is considered an industry with high growth potential. However, in

spite of the fact that PPI ranked us on this measure, reliable Hawai'i data was not available from the farm survey that they used. Therefore, this measure should not be used until such time as reliable data becomes available.

Education of the Manufacturing Workforce: Tracking the educational attainment of the manufacturing workforce provides some sense of the extent to which even old economy industries like manufacturing require more highly skilled and educated workers. The measure is particularly meaningful in states where manufacturing is a large employer. Like Online Manufacturers we decided not to use this PPI indicator because manufacturing is a very small part of the local economy and is projected to remain so. As such, the education of manufacturing workers is not indicative of the capacity of the broader Hawai'i workforce. Hawai'i happens to rank 1st among the 50 states.

Job Churning: This measure is designed to capture the dynamic process of business creation and destruction that is part of the dynamism of the New Economy. Churning serves as an indicator of economic restructuring as old industries are phased out and new ones emerge. According to PPI, Hawai'i ranks 28th in this indicator. Job Churning incorporates business failures in its measure on the assumption that business destruction is part of the dynamic process of economic change in a New Economy. However, business failures can also be indicative of general economic malaise as has been the case in Hawai'i for the past ten years. For these reasons we recommend replacing Job Churning with Successful Startups in attempting to measure entrepreneurship in the economy.

Initial Public Offerings: The number of initial public offerings (IPOs) in a state provides some sense of the extent to which firms are achieving rates of growth and scale sufficient to attract capital from the public (i.e. stock) market. The value of IPOs also indicates the level of overall public investment in the state economy. However a state economy can have high levels of entrepreneurial success and activity without a high number of IPOs. Furthermore, the number of IPOs in Hawai'i is so small (only 2 in 2001) that a single IPO could have a dramatic affect on our ranking. For these reasons, we recommend discarding IPOs as a measure of entrepreneurship and innovation in Hawai'i's economy.

Foreign Direct Investment: Employment in foreign-owned companies presumably leads to exchanges of management practices and business models from other countries and enhances the ability of local workers to operate in a global economy. Foreign direct investment is also an important indicator because New Economy states can tap foreign investment dollars to fuel local economic growth. PPI ranks Hawai'i 1st in this New Economy measure. However, in Hawai'i, foreign direct investment has consisted primarily of real estate acquisition and Japanese ownership of hotels and other visitor industry firms. Although the argument could be made that such foreign participation in our local economy has enhanced the capacity of our local workforce to participate in a global marketplace, the gains are not likely to be comparable to other types of foreign investment such as the location of a foreign corporate headquarters in our State. Furthermore, these gains must be weighed against the leakage of profits out-of-state, and the loss of local ownership of firms and industries—important issues for Hawai'i, given our history of colonization and outside influence. Finally, our visitor industry and educational institutions both attract foreigners to Hawai'i, allowing us to develop global competencies without foreign direct investment. For these reasons, we do not believe that foreign direct investment is an appropriate measure of New Economy progress for Hawai'i.

End Notes

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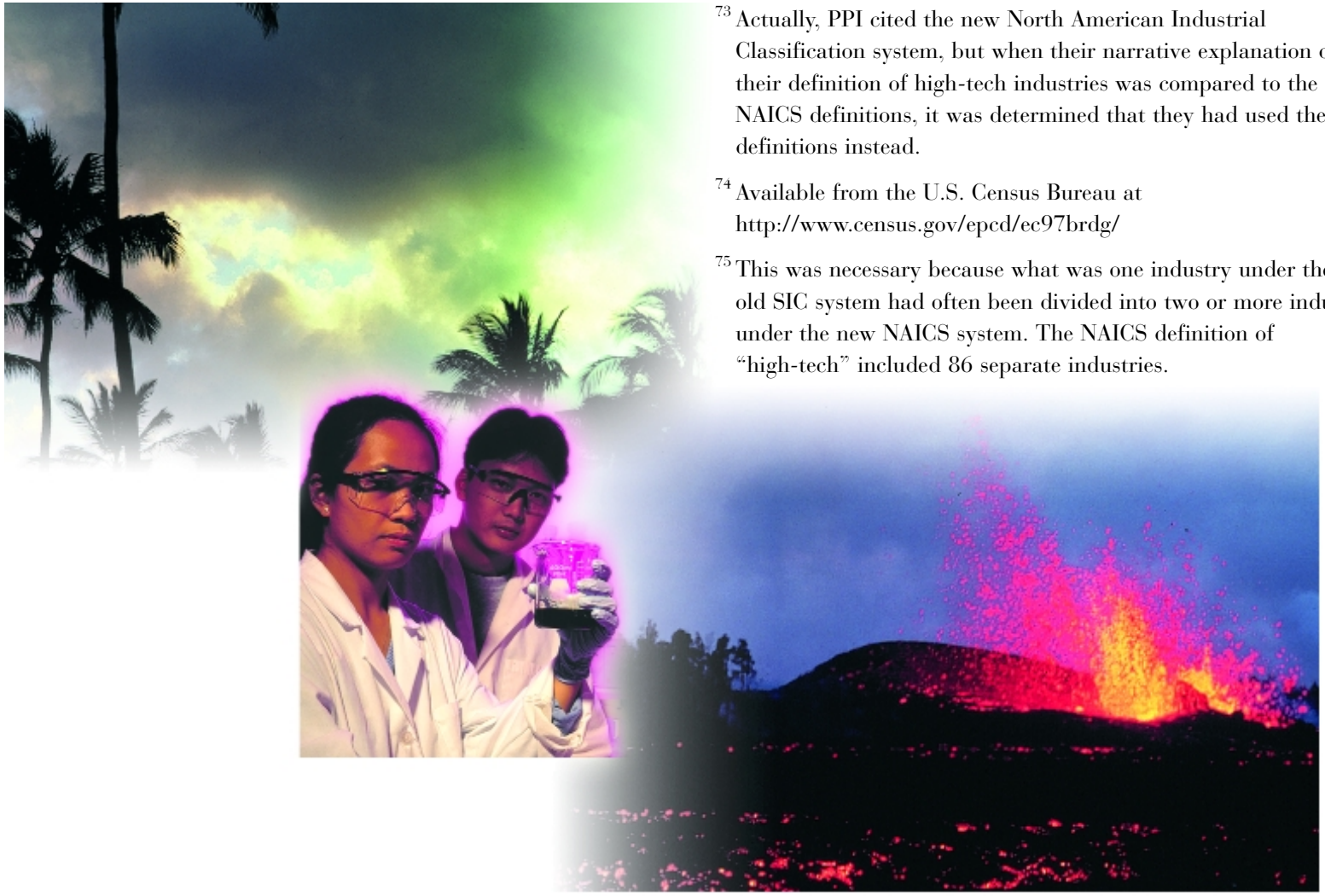

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Hawai'i Institute for Public Affairs
1001 Bishop Street
American Savings Bank Tower, Suite 1132
Honolulu, Hawai'i 96813
(808) 585-7931 Phone
(808) 585-7932 Facsimile
www.hipaonline.com

About the Authors

HAWAIʻI INSTITUTE FOR PUBLIC AFFAIRS

The Hawaiʻi Institute for Public Affairs (HIPA) is a nonprofit, nonpartisan, and independent research and educational organization whose mission is to provide research, analysis and recommendations on public policy issues facing Hawaiʻi, and to provide opportunities for individuals to develop as productive leaders and citizens in society. HIPA's Center for Public Policy concentrates on public policy analysis and implementation to enable decision-makers to make sound policies that benefit Hawaiʻi. Beyond just providing research briefs and issue papers, the Center strives to provide a neutral and supportive forum for key stakeholders and communities to implement policy recommendations outlined in reports.

HIPA PRINCIPAL INVESTIGATORS

James Koshiba, MPP is co-founder of 3Point Consulting (3Point)—a Hawaiʻi-based firm that was asked to be the principal investigator of this report. He has served as Business Development Manager and New Product Specialist with the Hawaiʻi Community Loan Fund—a nonprofit, community development financial institution providing technical assistance and access to capital for low-income entrepreneurs and communities. He has also served as Special Projects Manager for Boston Community Capital, where he helped expand access to venture capital for inner-city small business in the Northeastern United States. He has helped several government agencies create economic development plans for their communities, and has helped numerous nonprofit organizations design and fund their economic development projects. He also served as an Analyst for the Hawaiʻi State Auditor. James graduated Phi Beta Kappa from Brown University with a Bachelor's degree in Education and Public Policy and earned a Master of Public Policy focusing on economic development, finance, and nonprofit management from the John F. Kennedy School of Government at Harvard University.

Andrew Aoki, JD, MPP is co-founder of 3Point and also co-founder of College Connections Hawaiʻi—a nonprofit organization created to improve educational opportunities in Hawaiʻi. He has served as the Executive Administrator of the HMSA Foundation, Analyst for the Hawaiʻi State Auditor, and Program Director with the YMCA of Honolulu. In recognition of his entrepreneurial work in Hawaiʻi, Andrew received the 2002 Hoʻokele Award for nonprofit leadership. He is a member of the Hawaiʻi State Bar Association. Andrew received a Bachelor's degree in Political Science from Stanford University, a Juris Doctor from the University of Michigan Law School, and a Master of Public Policy specializing in economic development, social policy, and state government from the John F. Kennedy School of Government at Harvard University where he was designated as a Kennedy Fellow for exceptional academic ability and professional distinction.


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Hawai'i Institute for Public Affairs • 1001 Bishop Street • American Savings Bank Tower, Suite 1132 • Honolulu, Hawai'i 96813
(808) 585-7931 Phone • (808) 585-7932 Facsimile • www.hipaonline.com