

Hawaii Economic Issues

Periodic research and data reports on issues of current interest

State of Hawaii - Department of Business, Economic Development & Tourism
Research & Economic Analysis Division



Hawaii New Business Formation *an analysis of business birth, deaths, and survival rates*



November 2014

Table of Contents

EXECUTIVE SUMMARY	3
I. INTRODUCTION	7
II. BIRTHS AND DEATHS OF HAWAII BUSINESS ESTABLISHMENTS	10
III. STARTUP ESTABLISHMENTS	21
IV. SMALL BUSINESS EMPLOYMENT	23
V. SURVIVAL RATES FOR BUSINESS ESTABLISHMENTS	25
VI. SOLE PROPRIETORS AND OTHER NON-EMPLOYER FIRMS	34
VII. CONCLUSIONS	37

EXECUTIVE SUMMARY

This paper examines new business formation in Hawaii compared with the overall U.S. economy using data for the “births” and “deaths” of business establishments compiled by the U.S. Bureau of Labor Statistics.

The data show that establishment births and employment generated from establishment births are declining for both the U.S. and Hawaii. Furthermore, Hawaii is below the overall U.S. economy for establishment births as a percentage of total establishments and establishment birth employment as a percentage of total employment.

From 1994-2013, Hawaii had an average of 782 establishment births per quarter, which created an average of 3,683 jobs per quarter. However, during same period, while the average number of establishment births per quarter was comparable (767), the number of jobs created from establishment births declined substantially to 2,811 jobs per quarter.

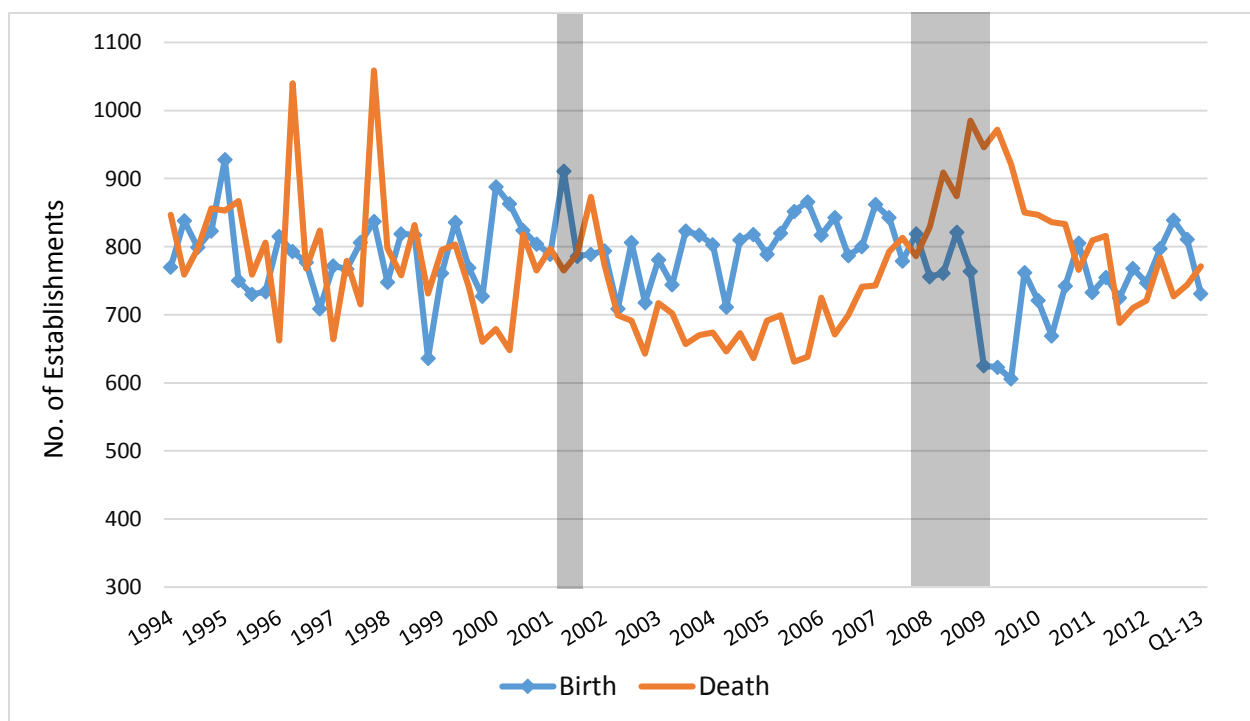
Concurrently during the 1994-2013 period, there was an average of 772 establishment deaths per quarter, which accounted for an average of 3,481 jobs lost per quarter. However, during the 2011-2013 period, these values declined to 752 and 2,485 respectively.

The decline in employment created from establishment births can be attributed to the fact that establishments can open and operate with fewer employees as technology increases worker productivity. In 1994, the average number of employees per establishment birth was 6.2 for the U.S. and 6.8 for Hawaii and, by 2012, these numbers had decreased to 3.9 and 3.8 respectively.

From an economic development standpoint, it is essential that business establishment births exceed establishment deaths. An economy where business establishments are closing faster than new establishments are opening is not sustainable.

As shown in the figure below, Hawaii's establishment births have generally exceeded establishment deaths. The main exception was the economic downturn, which had eleven consecutive quarters of establishment deaths exceeding establishment births, from first quarter 2008 through third quarter 2010. Births began to exceed deaths in the third quarter 2011 and this trend has continued through the fourth quarter 2012. However, in the first quarter of 2013, deaths climbed slightly above births.

Hawaii Business Establishment Births and Deaths per Quarter



Source: Bureau of Labor Statistics Business Employment Dynamics Data

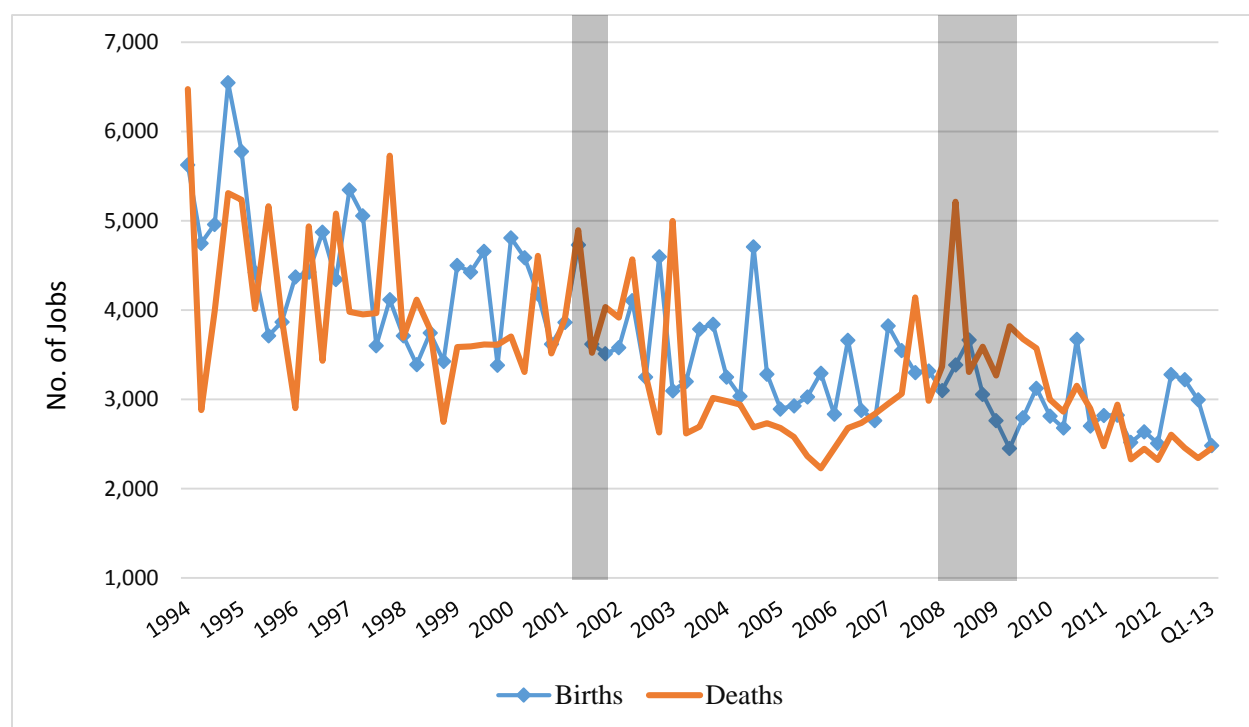
--shaded areas are recessions (3/2001 to 11/2001 & 12/2007 to 6/2009), data is seasonally adjusted; 2013 data includes 1st qtr. only

During the period of 1994-2012, the average number of establishment births per quarter declined at an average annual rate of 0.1 percent. While this decline was minimal, the employment created from establishment births was substantial, with an average annual rate of decline at 3.3 percent.

During the same period, the average number of establishment deaths per quarter declined at an average annual rate of 0.5 percent and employment lost from establishment deaths declined at an annual average rate of 3.6 percent.

The recession that started at the end of 2007 accelerated employment lost from establishment deaths, while reducing employment gained from establishment births. From first quarter 2008 through the second quarter of 2010, employment lost from establishment deaths exceeded employment gained from births in nine out of the ten quarters. This trend reversed in the third quarter of 2011 as employment created from establishment births exceeded employment lost through establishment deaths through the fourth quarter of 2012. However, the most recent data of first quarter of 2013, shows that the gap between birth and death employment has narrowed to almost zero.

Hawaii Employment Gains/Losses from Establishment Births and Deaths per Quarter



Source: Bureau of Labor Statistics Business Employment Dynamics Data

--shaded areas are recessions (3/2001 to 11/2001 & 12/2007 to 6/2009), data is seasonally adjusted; 2013 data includes 1st qtr. only

In addition to births and deaths, this paper analyzes the “survival rate” of establishments. The survival rate is defined as the percentage of establishments that are still in existence after a given number of years in business. In Hawaii, the data showed that only 50 percent of establishments remain after 5.5 years in business. The rate of decline in establishment survival rates decreases with time due to the fact that the weaker establishments are weeded out and the remaining establishments grow stronger.

One area the BLS data does not cover is firms with no employees. These are the self-employed and are defined by the Census Bureau as “non-employer” firms. Non-employer firms have generally had strong growth in the past decade, with the exception of the recession.

After a 6.5 percent increase in 2007, non-employer firms decreased 2.7 percent in 2008. The decline continued in 2009 and then levelled off in 2010. However, growth returned in 2011 and 2012, with the number of non-employer firms increasing at 2.2 percent and 3.2 percent respectively. While 2013 data has not been released yet, the trend shows that the number of non-employers could approach 100,000 firms, exceeding the 2007 peak of 96,263.

In summary, the data showed that, while establishment births have declined slightly during the 1994-2012 period, the employment generated from establishment births has declined substantially. This can partially be attributed to gains in labor productivity, which allows companies to do more with fewer employees. However, the impact of the decline in establishment births on total employment has been offset by a decline in employment lost from establishment deaths.

I. INTRODUCTION

New business formation is the pipeline for Hawaii's future economy. Each day new businesses are formed bringing innovative ideas to the market, creating jobs, and increasing tax revenue. This is the foundation of economic development and it is important to understand the trends in business formation and how Hawaii compares to the overall U.S. economy.

The economic development literature includes studies that support the hypothesis that smaller firms grow faster than larger firms. An earlier study in this area examined the growth of manufacturing firms between 1976 and 1983 and found that smaller firms had higher employment growth rates than larger firms (Hall, 1986). A more recent study examined the relationship between firm size and job growth between 1992 and 2004 and found that smaller firms created jobs at a higher rate than larger firms (Neumark et al., 2011).

However, there is also a body of literature that has been focusing on firm age as a driver for economic growth, rather than firm size. One study looked at the effect of firm age and job growth and found that younger firms had higher job growth than older firms, even when controlled for firm size (Haltiwanger, 2006). One reason for this appears to be that younger firms have more organizational flexibility and agility when compared with older firms. A recent study by Adelino et al. examined the relationship between firm age and the response to economic opportunities and found that younger firms react quicker to economic opportunities than older firms (Adelino et al, 2014).

Another factor that can help propel economies forward is the rate of business churn. Churn is the rate of business attrition or death. While this may seem counter-intuitive, a high rate of business churn has been linked to higher rates innovation (Robinson et al., 2006). The concept is that a steady pipeline of new businesses bring new innovations into an economy often faster than established businesses. Even if a large portion of the new businesses fail, a portion of the benefits of the innovation remain through knowledge gained by employees and related companies. In order to be sustainable, a high rate of business churn must be accompanied by a high rate of business formation or births.

One trend that was identified by a Bureau of Labor Statistics study is that business establishments in the U.S. are starting smaller and staying smaller. The study noted that the average number of employees per establishments decreased during the decade of 2000-2010. The authors propose that this decline is due to a greater emphasis on technology and less on labor (Choi and Spletzer, 2012).

As old businesses close, new businesses must be created to move the economy forward. While Hawaii's current economy remains robust, the growth of Hawaii's future economy will benefit from a steady pipeline of new businesses bringing innovative ideas to market. The purpose of this paper is to examine business formation in Hawaii through establishment birth rates, death rates, and survival rates. The paper will also examine Hawaii's self-employment and small business employment as compared to the overall U.S. economy.

Unit of Measure

The U.S. Bureau of Labor Statistics (BLS) compiles data called the Business Employment Dynamics (BED). This data set uses *establishments* in the tabulation of statistics by industry. Establishments are defined as an economic unit that produces goods or services (BLS 2013). The establishment predominantly engages in one activity. It is important to note that there is a distinct difference between *firms* and *establishments*. Firms are a single business entity that may have multiple establishments. For example, a retail company with one store would be counted as one firm and one establishment. However, if the same retailer had two stores, the count would be one firm and two establishments.

The BED provides data regarding establishment creation or "births" and establishment permanent closings or "deaths". Generally, births are defined as establishments that have the third month of employment for the first time in the current quarter and deaths are defined as third month of no employment in the current quarter (Sadeghi, 2008). The BED data is generated from the Quarterly Census of Employment and Wages program. It is important to note that the BED data does not include self-employed establishments and so these will be analyzed separately using U.S. Census Bureau data.

II. BIRTHS AND DEATHS of HAWAII BUSINESS ESTABLISHMENTS

The BED divides private sector job gains into two categories; jobs gained through the opening of establishments and jobs gained through the expansion of existing establishments. Conversely, job losses are divided into jobs lost through establishment closings and jobs lost through existing establishments contracting. The data is calculated on an annual basis March to March.

In looking at the period analyzed from 1994 to 2013, the average annual jobs gained was 51,359 or 11.3 percent of total employment (Table 1). Of this, 16,759 or 3.7 percent of employment came from establishment openings and 34,600 or 7.6 percent came from establishment expansions. On the other hand, the average annual jobs lost was 48,555 or 10.7 percent of employment. Of the jobs lost, 16,003 or 3.6 percent of employment came from establishment closings and 32,552 or 7.1 percent of employment came from contractions.

In 2013, 13,550 jobs were created from establishment openings and this was 2.8 percent of employment. Additionally, 37,813 jobs were created from establishment expansions and this was 7.8 percent of employment. Another way to look at this is that 26.4 percent of all job gains were from the new establishment openings and 73.6 percent were from current establishments expanding. While the percentage of jobs gained from expansions has held fairly steady over time, the percentage of jobs gained from new establishment openings has declined steadily.

From 1994 to 2013, the percentage of jobs gained from new establishment openings declined about 50 percent, from 5.8 percent to 2.8 percent of employment. During this same period, jobs lost from establishment closures, declined slightly more at 58.6 percent, from 5.8 percent to 2.4 percent of employment.

Table 1. Hawaii Employment by Type of Increase/Decrease as a Percentage of Total Employment

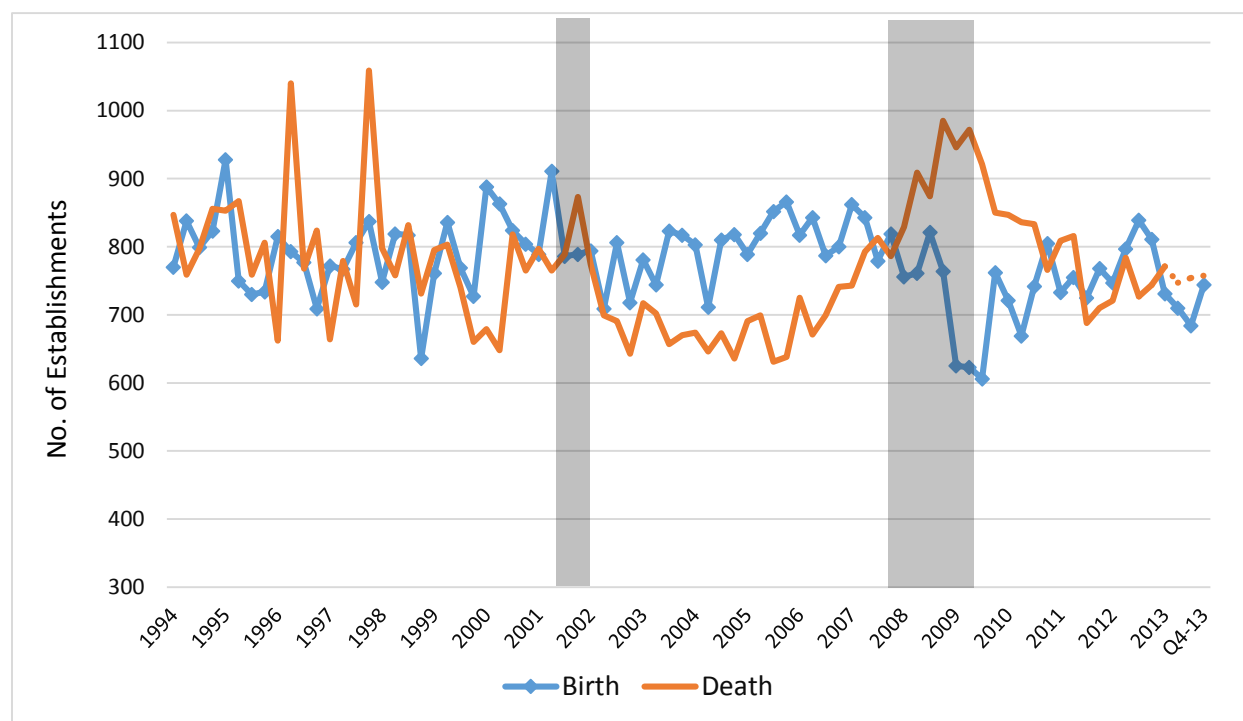
	Total Job			Total Job		
	Gain	Expansion	Opening	Loss	Contraction	Closing
1994	13.3%	7.5%	5.8%	14.7%	8.9%	5.8%
1995	12.9%	7.2%	5.7%	12.7%	8.4%	4.3%
1996	11.6%	7.4%	4.2%	12.6%	8.5%	4.1%
1997	12.1%	7.4%	4.7%	11.8%	7.6%	4.2%
1998	11.3%	7.2%	4.1%	11.9%	7.3%	4.6%
1999	11.6%	7.5%	4.1%	11.5%	7.6%	3.9%
2000	12.6%	8.3%	4.3%	9.6%	5.9%	3.7%
2001	12.2%	8.4%	3.8%	9.9%	6.0%	3.9%
2002	11.0%	7.2%	3.8%	13.4%	9.2%	4.2%
2003	12.3%	8.9%	3.4%	9.6%	5.8%	3.8%
2004	11.3%	7.9%	3.4%	8.9%	6.1%	2.8%
2005	12.6%	9.2%	3.4%	8.4%	5.7%	2.7%
2006	11.6%	8.6%	3.0%	8.3%	5.9%	2.4%
2007	10.8%	7.8%	3.0%	9.1%	6.6%	2.5%
2008	10.2%	7.0%	3.2%	10.0%	7.0%	3.0%
2009	8.3%	5.4%	2.9%	14.7%	11.1%	3.6%
2010	9.0%	6.0%	3.0%	11.5%	8.1%	3.4%
2011	10.5%	7.6%	2.9%	8.6%	5.7%	2.9%
2012	10.2%	7.4%	2.8%	8.8%	6.3%	2.5%
2013	10.6%	7.8%	2.8%	7.5%	5.1%	2.4%
Avg.	11.3%	7.6%	3.7%	10.7%	7.1%	3.5%

Source: Bureau of Labor Statistics, Establishment Age and Survival Data (calculations are March to March)

From an economic development standpoint, it is essential that business establishment births exceed business establishment deaths. An economy where businesses are closing faster than new businesses are opening is not sustainable. The chart below compares quarterly establishment births and deaths from 1994 through 2012. Generally, Hawaii's establishment births have exceeded establishment deaths. The main exception was the recent recession when there was eleven consecutive quarters of establishment deaths exceeding establishment births, from first quarter 2008 through third quarter 2010. After this period, births and deaths began to converge and then from third quarter 2011 through fourth quarter 2012, births exceeded deaths. However,

in the first quarter of 2013, births declined slightly below deaths and the decline continued until third quarter of 2013. As of this writing, the latest data available for births is the fourth quarter of 2013. However, there is a three month lag for establishment death data and so the death data from the second quarter through the fourth quarter of 2013 is estimated using a three period moving average.

Figure 1. Hawaii Business Establishment Births and Deaths per Quarter



Source: Bureau of Labor Statistics Business Employment Dynamics Data and DBEDT estimate

--shaded areas are recessions (3/2001 to 11/2001 & 12/2007 to 6/2009), data is seasonally adjusted, Q2-Q4 2013 deaths are estimated based on three quarter moving average

The average number of establishment births and deaths declined slightly in each period analyzed. Table 2 shows that from 1994 to 2000 the average number of births per quarter was 791 and deaths was 789 and this declined

Table 2. Average Number of Hawaii Establishment Births and Deaths per Quarter

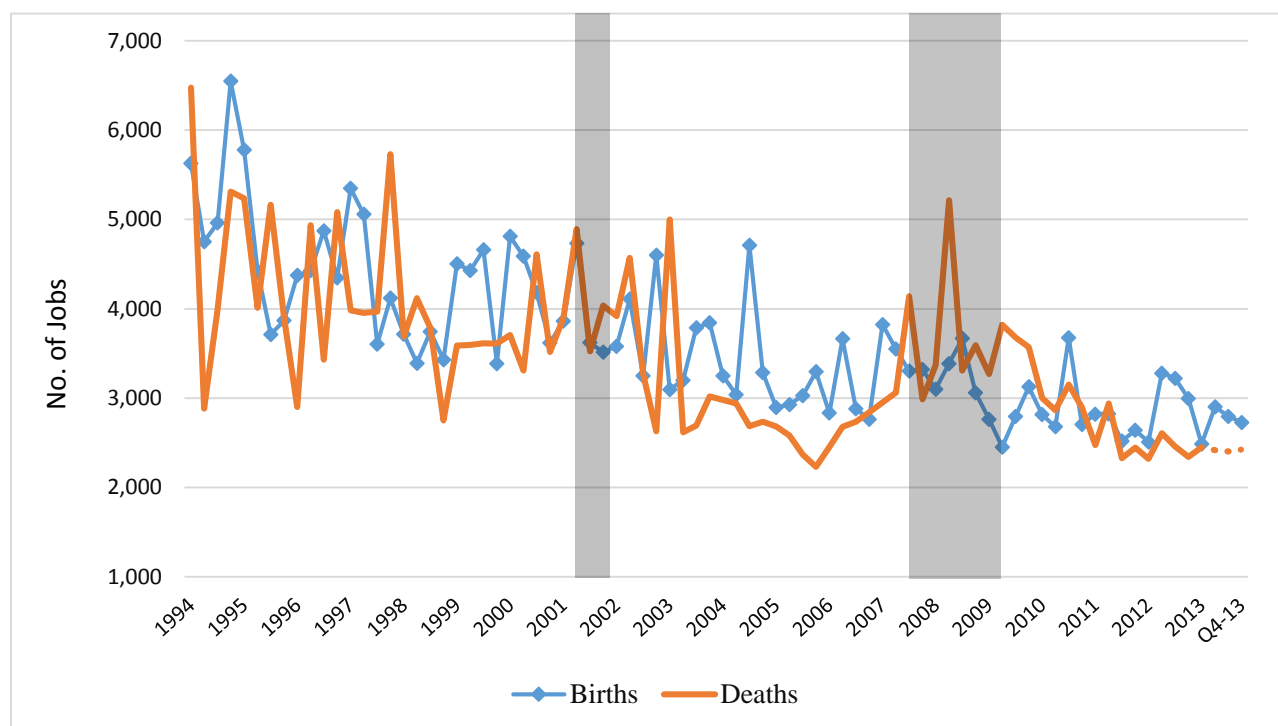
Period	Birth	Death	Net
1994-2000	791	789	2
2001-2010	779	765	14
2011-2013	767	752	15
1994-2013	782	772	10

Source: Bureau of Labor Statistics, Business Employment Dynamics Data, 2013 1st qtr. only

to 779 and 765 respectively during the 2001 to 2010 period. During the most recent period of 2011-2013, the average number of births and deaths was 767 and 752 respectively or a 3.0 percent and 4.7 percent respective decreases from the 1994-2000 period.

While the number of establishment births and deaths declined only slightly since 1994, the employment gained from establishment births and lost from establishment deaths has declined dramatically (Figure 2). The first quarter in the data analyzed was the fourth quarter of 1994, and this quarter had a 6,549 increase in employment from establishment births and a 5,311 decrease in employment from establishment deaths. By the fourth quarter of 2012, these employment numbers had declined by more than half to 2,997 and 2,343 respectively. The 2007 recession accelerated employment lost from establishment deaths, while reducing employment gained from establishment births. From the first quarter 2008 through the second quarter of 2010, employment lost from establishment deaths exceeded employment gained from births in nine out of the ten quarters. From the third quarter of 2011 through the fourth quarter of 2012, employment created from establishment births overtook employment lost through establishment deaths. However, in 2013, the gap between employment from births and deaths narrowed, with birth employment showing a downward trend.

Figure 2. Hawaii Employment Gains/Losses from Establishment Births and Deaths per Quarter



Source: Bureau of Labor Statistics, Business Employment Dynamics Data and DBEDT estimate

--shaded areas are recessions (3/2001 to 11/2001 & 12/2007 to 6/2009), data is seasonally adjusted, Q2-Q4 2013 deaths are estimated based on three quarter moving average

As shown in table 3, the average employment gained per quarter from establishment births has exceeded employment lost from establishment deaths in all three periods analyzed. Furthermore, the employment

gained and lost from establishment births/deaths declined in all three periods. The average employment gains/losses from establishment births and deaths for the period of 1994 to 2000 was 4,439 employment gained from births and 4,101 employment lost from deaths and, by the 2011-2013 period, these averages declined to 2,811 and 2,485 respectively.

Table 3. Avg. Emp. Gained from Hawaii Estab. Births and Lost from Deaths per Qtr.

Period	Birth	Death	Net
1994-2000	4439	4101	338
2001-2010	3350	3271	79
2011-2013	2811	2485	326
1994-2013	3683	3481	202

Source: Bureau of Labor Statistics, Business Employment Dynamics Data, 2013 1st qtr. only

The table to the right compares the percent change for establishment births and deaths for the 1994-2012 period using quarterly averages for each respective year. As of this writing, there is not a full year of data for 2013 and so this year was not included. The

Table 4. Hawaii Average Annual % Change in Establishment Births and Deaths

Year	Birth		Death	
	Estab.	Jobs	Estab.	Jobs
1994	808	5472	815	4665
2012	799	3002	744	2432
Avg. Annual	-0.1%	-3.3%	-0.5%	-3.6%
Total Change	-1.1%	-45.1%	-8.7%	-47.9%

Data is quarterly average for the year

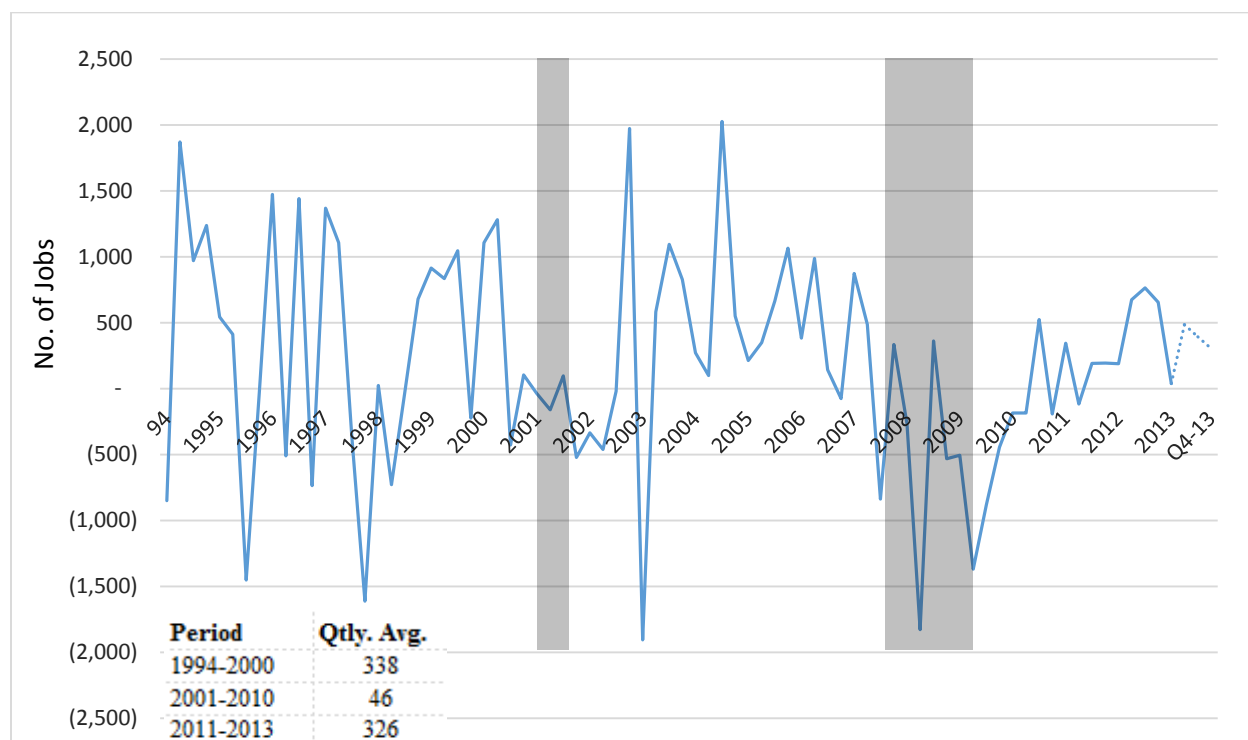
Source: Bureau of Labor Statistics, Business Employment Dynamics Data

data shows that, during 1994-2012 period, the decline in establishment deaths has exceeded that of establishment births. In looking at the number of establishments, the total decline for births was 1.1 percent and the decline for deaths was 8.7 percent. Employment declined 45.1 percent for establishment births and 47.9 percent for establishment deaths. In other words, although there has been a decline in establishment births and jobs gained from establishment births, this has been more than offset by an even greater decrease in establishment deaths and establishment job losses from establishment deaths.

Another way to look at this is net job gains or losses from establishment births minus establishment deaths. As shown in Figure 3, net job growth was strong for most of the quarters from 1994 to the 2001 recession, declined in 2002, and then generally increased until third quarter of 2007. The 2007 recession impacted net job growth from 2008 through second quarter of 2010. Solid net job growth returned in the third quarter of 2011, with consecutive quarters of positive net job growth through the first quarter of 2013. The table embedded in the figure shows average net employment gains for different periods. The 1994-2000 period averaged 338 net employment gains from business births minus deaths. This declined substantially to 79 during the 2001-2010 period, which included two recessions. The 2011-2013 period had 326

average net employment gain per quarter, which is above the previous period but still below the 1994-2000 period.

Figure 3. Net Employment Gained from Hawaii Establishment Births and Deaths per Quarter



Source: Bureau of Labor Statistics, Business Employment Dynamics Data and DBEDT estimate
 --shaded areas are recessions (3/2001 to 11/2001 & 12/2007 to 6/2009), Q2-Q4 2013 are estimated based on three quarter moving average

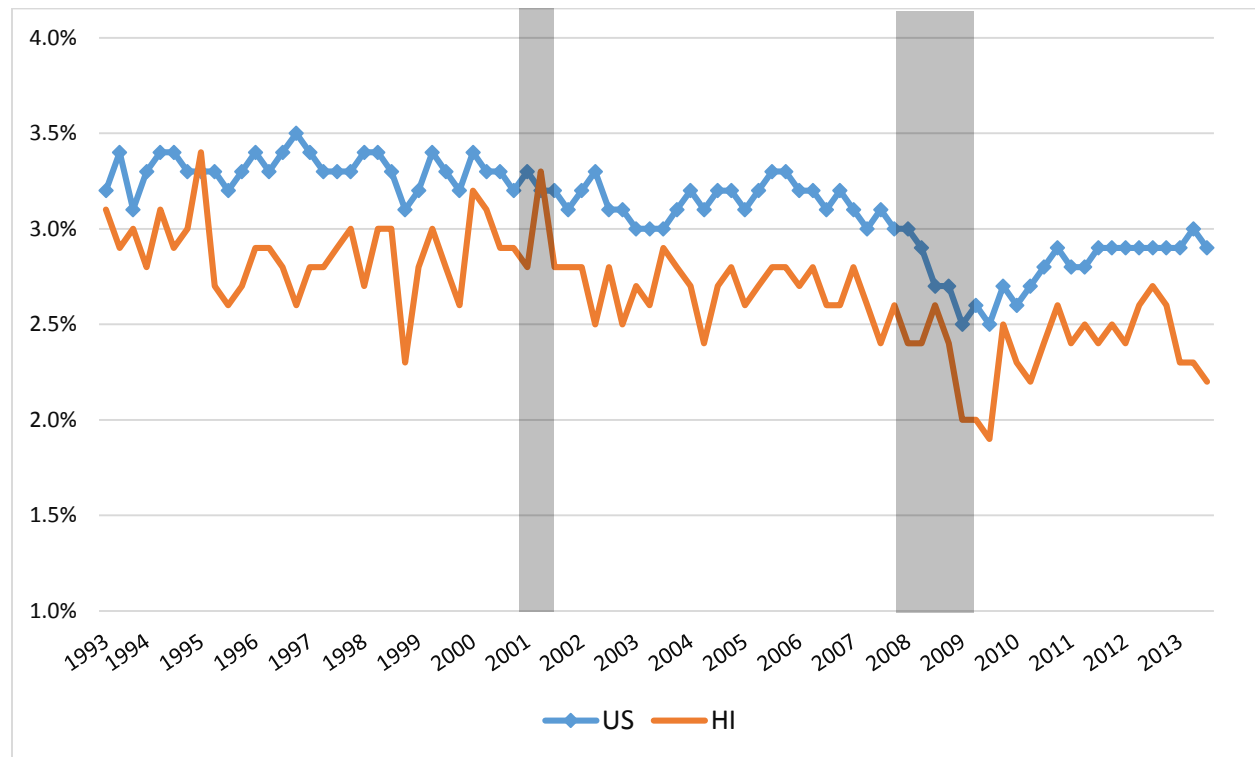
Comparison of Hawaii and the U.S. Establishment Births

This section compares Hawaii's establishment birth rate to that of the overall U.S. economy by analyzing establishment births as a percentage of total establishments and employment created from establishment births as a percentage of total employment.

Figure 4 shows establishment births on a quarterly basis as a percentage of total establishments. The period measured is from first quarter of 1994 through the third quarter of 2013, which is the latest data available. The higher the percentage the higher the rate of new establishment formation indicating a higher level of entrepreneurial activity. The data shows that Hawaii has

generally lagged the overall U.S. economy in the percentage of establishment births to total establishments. The percentage of establishment births declined sharply in both Hawaii and the overall U.S. economy as a result of the recession. As of third quarter 2013, both the U.S. and Hawaii have yet to recover to pre-recession levels of establishment births.

Figure 4. Establishment Births as a Percentage of Total Establishments per Quarter



Source: Bureau of Labor Statistics, Business Employment Dynamics Data
 --shaded areas are recessions (3/2001 to 11/2001 & 12/2007 to 6/2009)

The average percentage of establishment births as a percentage of total establishments was 3.1 percent for the U.S. and 2.7 percent for Hawaii for the period from first quarter of 1994 through second quarter 2013. As Table 5 shows, the average rate for the

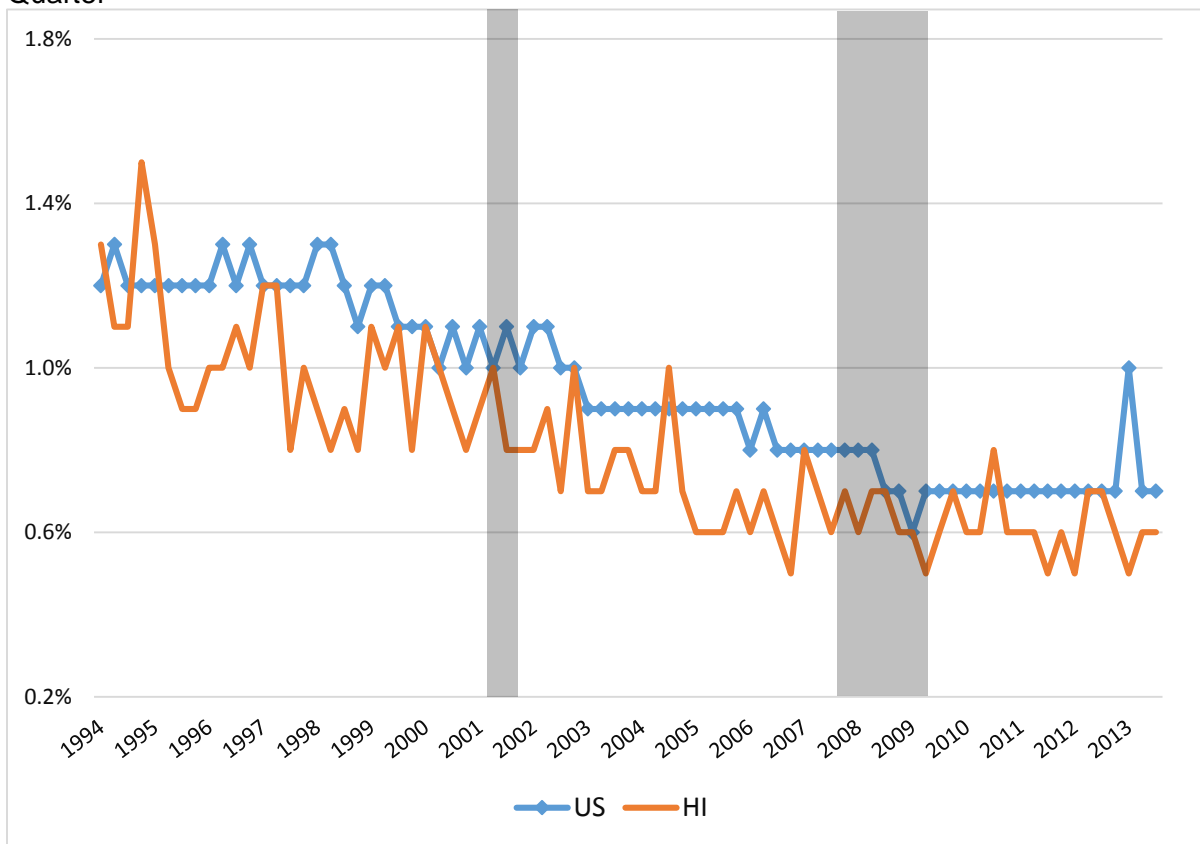
Table 5. Avg. Qtly. Establishment Births as a % of Total Establishments

Period	U.S.	HI
1994-2000	3.3%	2.9%
2001-2010	3.0%	2.6%
2011-2013	2.9%	2.4%
1994-2013	3.1%	2.7%

Source: Bureau of Labor Statistics, Business Employment Dynamics Data

overall U.S. economy from 1994 to 2000 was 3.3 percent and this declined to 2.9 percent for the period of 2011 to 2013. Hawaii had a similar decline from an average of 2.9 percent for the period of 1994 to 2000 to an average of 2.4 percent for the 2011 to 2013 period. Furthermore, as shown in Figure 5, employment created from establishment births has declined steadily for both Hawaii and the overall U.S. economy. As with the percentage of establishment births, Hawaii's employment created from establishment births trailed the overall U.S. economy as a percentage of total employment. It is important to note that establishment births are a sub-set of establishment openings presented in Table and both of these groups show declining employment trends.

Figure 5. Employment from Establishment Births as a Percentage of Total Employment per Quarter



Source: Bureau of Labor Statistics, Business Employment Dynamics Data
 -shaded areas are recessions (3/2001 to 11/2001 & 12/2007 to 6/2009)

The employment generated from establishment births as a percentage of total employment was 1.0 percent for the U.S. and 0.8 percent for Hawaii for the period from first quarter of 1994 through third quarter 2013. From 1994-2000, the overall U.S. economy averaged 1.2 percent and Hawaii 1.0 percent of employment created from establishment births. During the most recent period of 2011-2013, this had declined to 0.7 percent for the U.S. and 0.6 percent for Hawaii.

Table 6. Avg. Qtly. Birth Employment as a Percentage of Total Employment

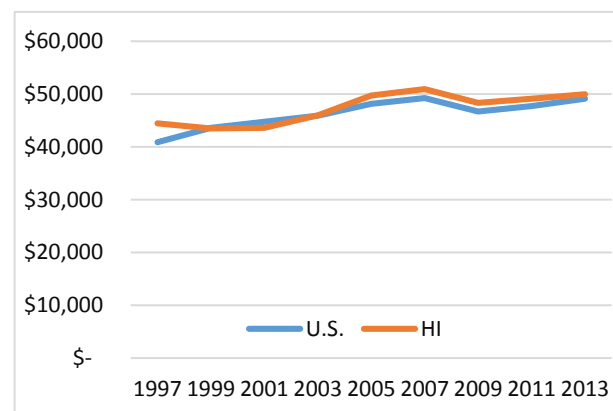
Period	U.S.	HI
1994-2000	1.2%	1.0%
2001-2010	0.9%	0.7%
2011-2013	0.7%	0.6%
1994-2013	1.0%	0.8%

Source: Bureau of Labor Statistics, Business Employment Dynamics Data

Previous research has shown that improvements in technology have increased productivity, which has led to a decline in the employment number per establishment birth (Choi and Spletzer 2012). The productivity gains can be seen in the increase in real GDP per capita for both the U.S. and Hawaii (Figure 6).

Between 1997 and 2013, Hawaii's GDP per capita increased 12.4 percent or an average annual compounded rate of 0.7 percent. The U.S. had stronger productivity gains with a 20.2 percent increase or an average annual compound rate of 1.2 percent. One result of the productivity gains is that companies can now start and operate with fewer people.

Figure 6. Real GDP per Capita (chained 2009 \$)

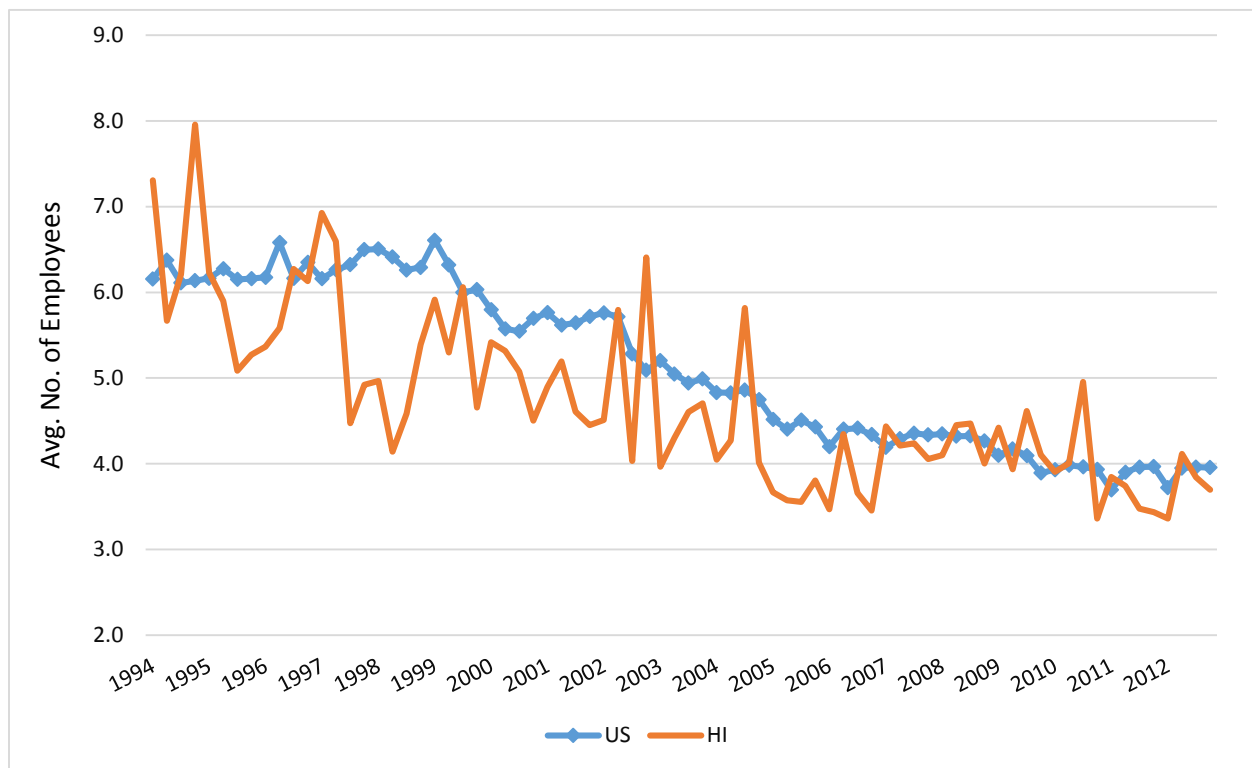


Source: Bureau of Economic Analysis, Regional Data

This trend can be seen in Figure 7, the percentage of employment of establishment births to total employment has been steadily declining for both the U.S. and Hawaii. In 1994, the average number of employees per establishment birth was 6.2 for the U.S. and 6.8 for Hawaii and, by

2012, these numbers had decreased to 3.9 and 3.8 respectively. A company today can start with a good product, online transaction processing, and a few good employees. This same company would have required up to twice the employees in 1994. Additionally, shifting labor patterns, such as an increase in temporary employment, could be a contributing factor.

Figure 7. Average Employment per Establishment Birth per Quarter



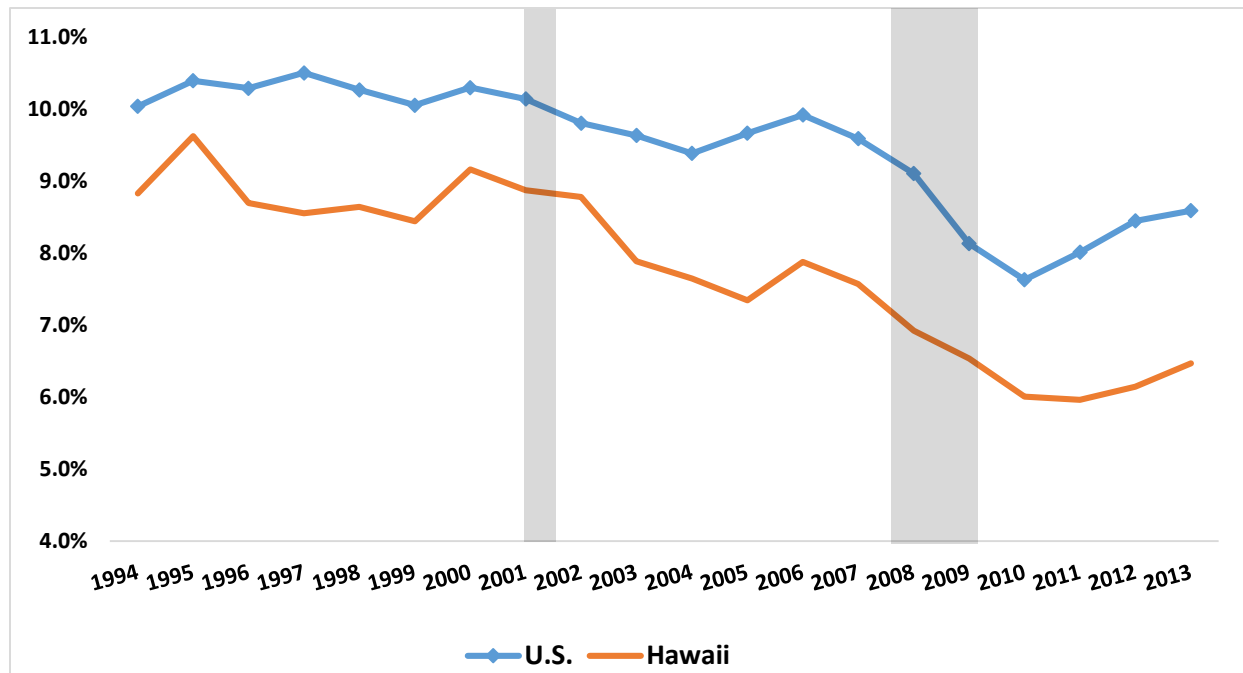
Source: Bureau of Labor Statistics, Business Employment Dynamics Data

This section compared establishment births in Hawaii and the U.S. and found three general trends. First, establishment births and employment generated from establishment births are declining for both the U.S. and Hawaii. Second, the percentage of establishment births and employment generated from births are both below that of the U.S. economy, indicating a lower level of business creation. Third, the number of employees per establishment birth is declining in both the overall U.S. economy and Hawaii.

III. STARTUP ESTABLISHMENTS

Establishment births are a good measure for the rate at which new establishments enter the economy. Another measure for entrepreneurial activity is the percentage of startup establishments, which are defined by the Census Bureau as those that have been in operation for less than one year (Census Bureau 2012). As the figure below shows, Hawaii has lagged the overall U.S. economy in the percentage of startup establishments during the period analyzed. The declines for both Hawaii and the U.S. were fairly gradual from 1994 through 2005 and then, after a temporary increase, the declines began to accelerate from 2006 and continued through the recession. Since 2010 in the U.S. and 2011 in Hawaii, the percentage of startup establishments has been recovering. However, both the U.S. and Hawaii are still below pre-recession levels.

Figure 8. Startup Establishments Less than One Year Old as a Percentage of Total Establishments



Source: Bureau of Labor Statistics, Business Employment Dynamics Data
-shaded areas are recessions (3/2001 to 11/2001 & 12/2007 to 6/2009)

In 2013, the percentage of establishments, less than one year old, was 8.6 percent for the U.S and 6.5 percent for Hawaii. Table 7 compares the average percentage of establishments less than one year old for three periods. From 1994 to 2000, Hawaii was 8.9 percent and the overall U.S. was 10.3 percent.

These averages declined to 7.5 percent and 9.3 percent respectively for the 2001 to 2010 period. While the post-recession period has shown some recovery, the average of the 2011 to 2013 period is still below that of the previous period.

Table 7. Avg. Annual Percentage of Establishments Less than One Year Old

Period	Hawaii	U.S.
1994-2000	8.9%	10.3%
2001-2010	7.5%	9.3%
2011-2013	6.2%	8.4%
1994-2013	7.8%	9.5%

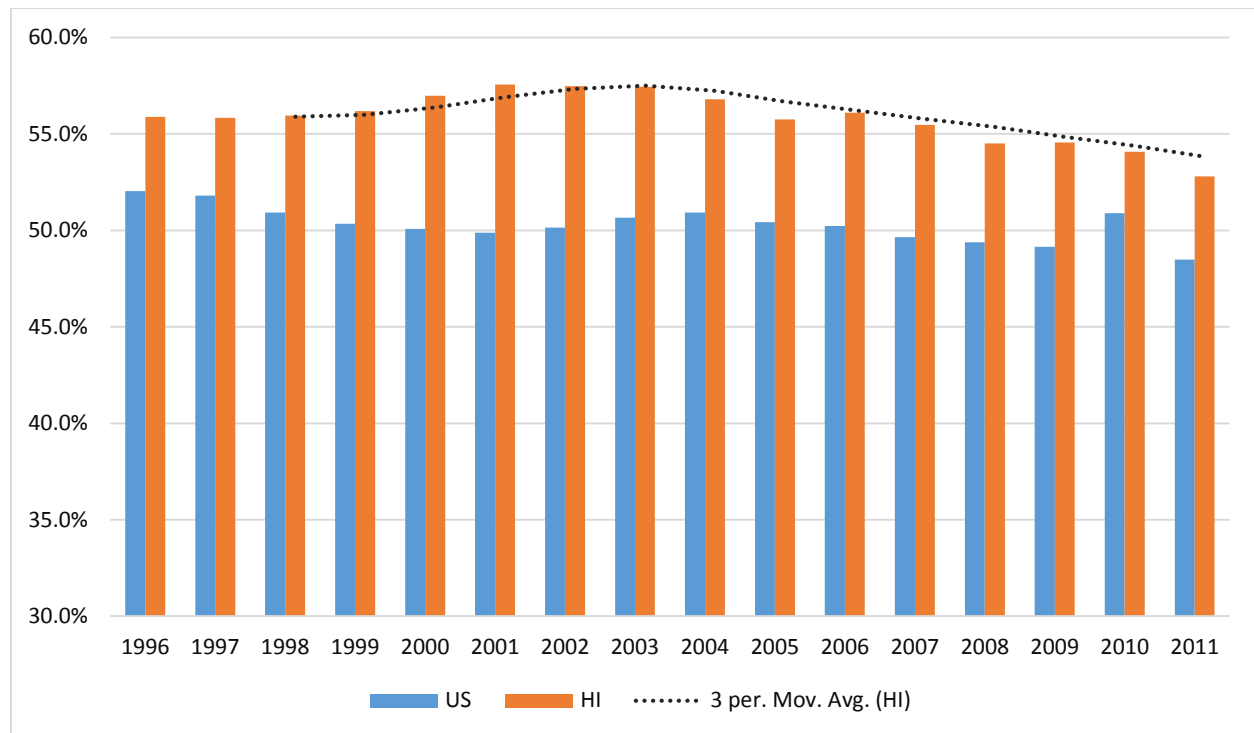
Source: Bureau of Labor Statistics

IV. SMALL BUSINESS EMPLOYMENT

While small business is not the main focus of this paper, it is important to understand the importance of small business and how establishment births feeds the small business pipeline. The U.S. Small Business Administration has varying definitions of small business depending on the industry. For the purpose of this paper, we chose the SBA definition of 500 employees or less, which applies to wholesale/distribution and other industries (SBA 2014). As of this writing, the most recent data available is 2011 and, Hawaii's small business employment was 52.8 percent as a percentage of total employment in 2011. Hawaii's small business employment was 4.3 percentage points higher than the overall U.S. figure of 48.5 percent. For the period of 1996 to 2011, Hawaii's average percentage for small business employment was 55.8 percent, which was 5.5 percentage points higher than the U.S. at 50.3 percent. Furthermore, Hawaii had a higher percentage of small business employment than the overall U.S. economy for the total period analyzed (Figure 9).

The percentage of small business employment to total employment in Hawaii has been declining. The three year moving average trend line for Hawaii shows a downward trend starting in 2003 and continuing through the recession. This decline is especially pronounced in Hawaii's post-recession economy, with 2010 and 2011 reaching new lows at 54.1 percent and 52.8 percent respectively.

Figure 9. Small Business Employment as a Percentage of Total Employment



Source: U.S. Census Bureau, Statistics of U.S. Business

In looking at the gap between Hawaii and the overall U.S. economy, one explanation appears to be that smaller states have a higher percentage of small business employment. Table 8 compares Hawaii to four other states with similar populations: New Hampshire, Rhode Island, Idaho, and Maine. All four had higher percentages of small business than the overall U.S. economy, indicating that larger businesses tend to locate in states with larger populations.

Table 8. % Small Bus. Employment in 2011

State	% Small Bus.	Pop (millions)
NH	51.0%	1.3
HI	52.8%	1.4
RI	54.7%	1.1
ID	56.4%	1.6
ME	58.5%	1.3
US	48.5%	308.7

Source: U.S. Census Bureau, Statistics of U.S. Business

V. SURVIVAL RATE FOR NEW ESTABLISHMENTS

One statistic that illustrates the importance of having a steady pipeline of establishment births is the survival rate of establishments. The survival rate is defined as the percentage of establishments that are still in existence after a given number of years in business. The data below is from the BLS' Business Employment Dynamics dataset, which starts with 1994. One assumption of the data is that all establishments started in a given year survive that year and therefore the first row in the table below is 100 percent.

The number of years used to calculate the average survival rate is denoted by "n". For example, there were 19 years of data used to calculate the average survival rates of companies that have been in business for one year. For the bottom row, there were 2 startup years (1994 and 1995) used to calculate the average survival rate of establishments that had been in business for 18 years and survived until the corresponding years of 2012 and 2013.

In comparing Hawaii to the overall U.S. economy, Hawaii's survival rate was higher in each of the years examined (Table 9). For example, the average survival rate for establishments that have been in business for one year is 79.7 percent for Hawaii and 78.4 percent for the U.S., ten years is 39.1 percent for Hawaii and 34.3 percent for the U.S., and eighteen years is 24.4 percent for Hawaii and 22.7 percent for the U.S. This difference was especially pronounced in year 6 through 12 years in business, where Hawaii's survival rate surpassed that of the U.S. by over 4 percentage points.

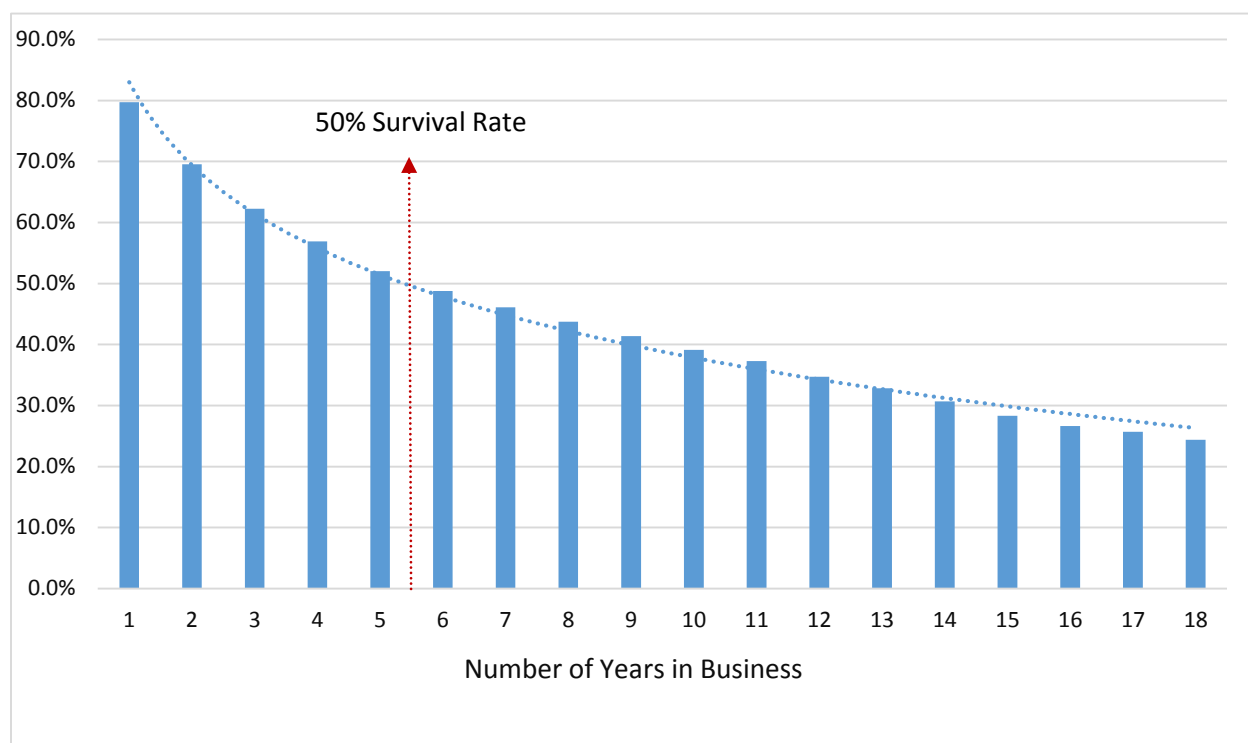
Table 9. Average Survival Rate for Establishments by Years in Business

Years in Bus.	n	HI	U.S.	Difference
Startup Year	n/a	100%	100%	n/a
1 year	19	79.7%	78.4%	1.3%
2 years	18	69.5%	67.5%	2.0%
3 years	17	62.2%	59.7%	2.6%
4 years	16	56.9%	53.6%	3.4%
5 years	15	52.1%	48.6%	3.5%
6 years	14	48.8%	44.6%	4.2%
7 years	13	46.1%	41.5%	4.6%
8 years	12	43.7%	38.8%	4.9%
9 years	11	41.4%	36.5%	4.9%
10 years	10	39.1%	34.3%	4.9%
11 years	9	37.3%	32.3%	5.0%
12 years	8	34.7%	30.5%	4.3%
13 years	7	32.8%	29.0%	3.8%
14 years	6	30.7%	27.5%	3.2%
15 years	5	28.3%	26.0%	2.3%
16 years	4	26.6%	24.7%	1.9%
17 years	3	25.7%	23.7%	2.0%
18 years	2	24.4%	22.7%	1.7%

Source: Bureau of Labor Statistics Establishment Age and Survival Rates

There is an inverse relationship between the number of years in business and the survival rate, as the survival rate declines with time. Another way to think about establishment survival rates is natural selection; the weaker establishments tend to die out after a few years and the stronger establishments survive and grow. As shown in Figure 10, the rate of decline is the steepest in the first five years, with approximately 50 percent of the establishments gone by the middle of the fifth year. After the fifth year, the rate of decline decreases as establishments compete successfully in the market and grow.

Figure 10. Average Survival Rate of Hawaii Establishments by Number of Years in Business

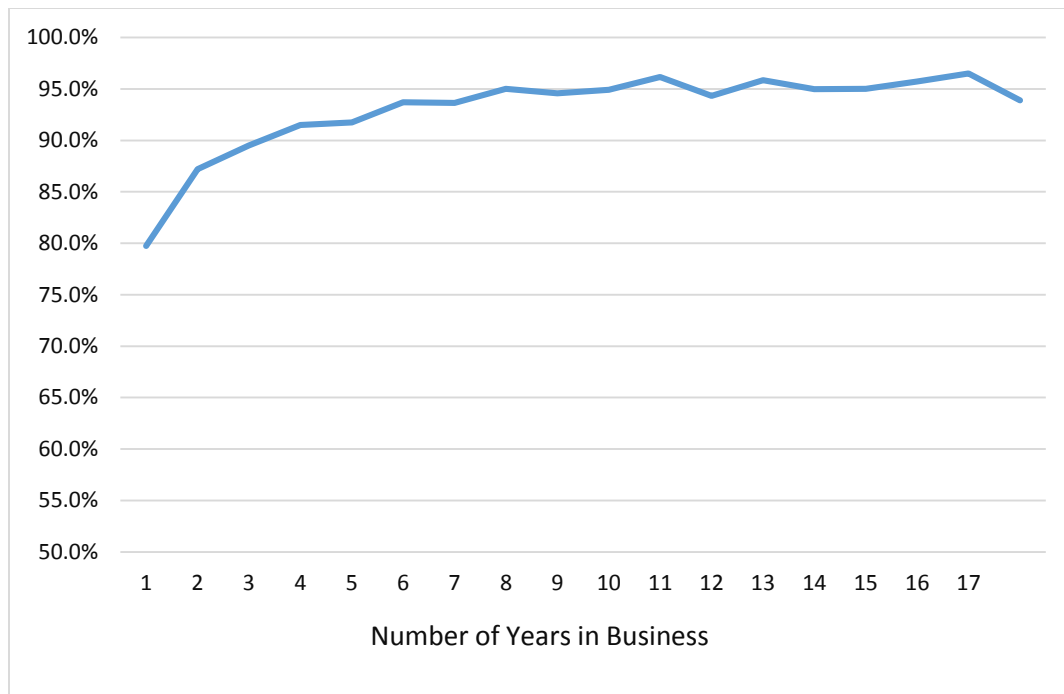


Source: Bureau of Labor Statistics, Establishment Age and Survival Rates 2013

In addition to the survival rate from the founding year, another useful statistic is the survival rate from the previous year. The average survival rate over the previous year for establishments that have been in business for one year is 79.7 percent, which is the same as the average survival rate as calculated from the founding year. These two figures begin to differ from year two, since the latter compares for the previous year rather than the founding year. The average survival rate, from the previous year, for establishments that have been in business for two years is 87.2 percent and this increases to 95.0 percent for companies that have been in business for eight years.

The average survival rate over the previous year during the first seven years of business is 89.6 percent and this increased to 95.2 percent for years nine through eighteen (Figure 11). The data show that business establishments become more resilient with age and this is especially pronounced for establishments that have been in business for more than seven years.

Figure 11. Mean Survival Rate of Hawaii Establishments from Previous Year by Number of Years in Business



Source: Bureau of Labor Statistics, Establishment Age and Survival Rates 2013

Survival Rates for 2003 Establishment Births

In order to illustrate the impact of survival rates, we can look at the cohort of startup establishments from 2003 and examine the ten year survival rates based on 2013 data. In 2003, there were 2,242 new business establishments in Hawaii and by 2013 this number had declined to 941, a 42 percent survival rate (Table 10).

Table 10. Hawaii Surviving Establishments Started in 2003

Year	No. of Surviving Establishments	% of Surviving Establishments	Employment of Surviving Establishments	% of Jobs for Surviving Establishments	Avg. Jobs per Establishment
2003	2,242	100.0%	13,317	100.0%	5.9
2004	1,868	83.3%	13,692	102.8%	7.3
2005	1,696	75.6%	13,972	104.9%	8.2
2006	1,543	68.8%	14,414	108.2%	9.3
2007	1,425	63.6%	13,870	104.2%	9.7
2008	1,323	59.0%	14,158	106.3%	10.7
2009	1,185	52.9%	12,302	92.4%	10.4
2010	1,103	49.2%	11,838	88.9%	10.7
2011	1,038	46.3%	11,759	88.3%	11.3
2012	981	43.8%	11,690	87.8%	11.9
2013	941	42.0%	11,454	86.0%	12.2

Source: Bureau of Labor Statistics Establishment Age and Survival Rates 2013, Annual data is calculated from March to March

However, the survival rate for establishments does not tell the whole story. While only 42 percent of the establishments survived, 86 percent of the original employment survived. This percentage illustrates how strong establishments, not only survive, but thrive and create more jobs. While the number of establishments that survive declines, the average number of jobs per surviving establishment increases. Of the establishments started in 2003, the number of jobs per surviving establishment doubled from 5.9 in 2003 to 12.2 in 2013.

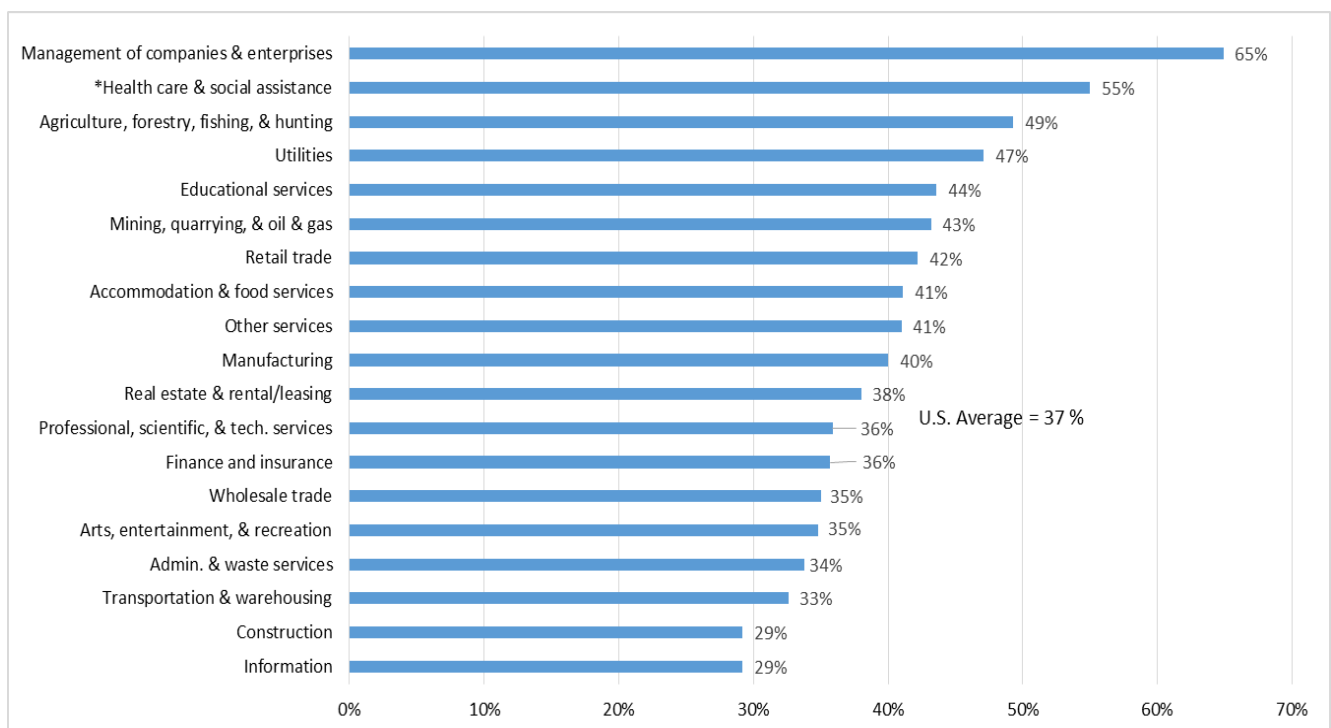
Another factor that impacts survival rates is the industry group of the establishment. While data is not available for Hawaii, the figure below shows survival rates in 2013 for U.S. establishments started in 2003 by industry (Figure 12). The industries with the highest survival rates were

management of companies, health care and social assistance, and agriculture/forestry/fishing.

These results were consistent for the all years analyzed after the 2003 start date.

The industries with the lowest survival rates for establishments started in 2003 were construction, information, and transportation/warehousing. However, these results tended to vary with the business cycle. For example, the survival rate for the construction industry was actually higher than industries overall in the years leading up to the recession. However, after 2008, the survival rate for the construction industry fell below that of the overall economy and remained there until 2013.

Figure 12. The 2013 Survival Rate for U.S. Establishments Started in 2003 by Industry

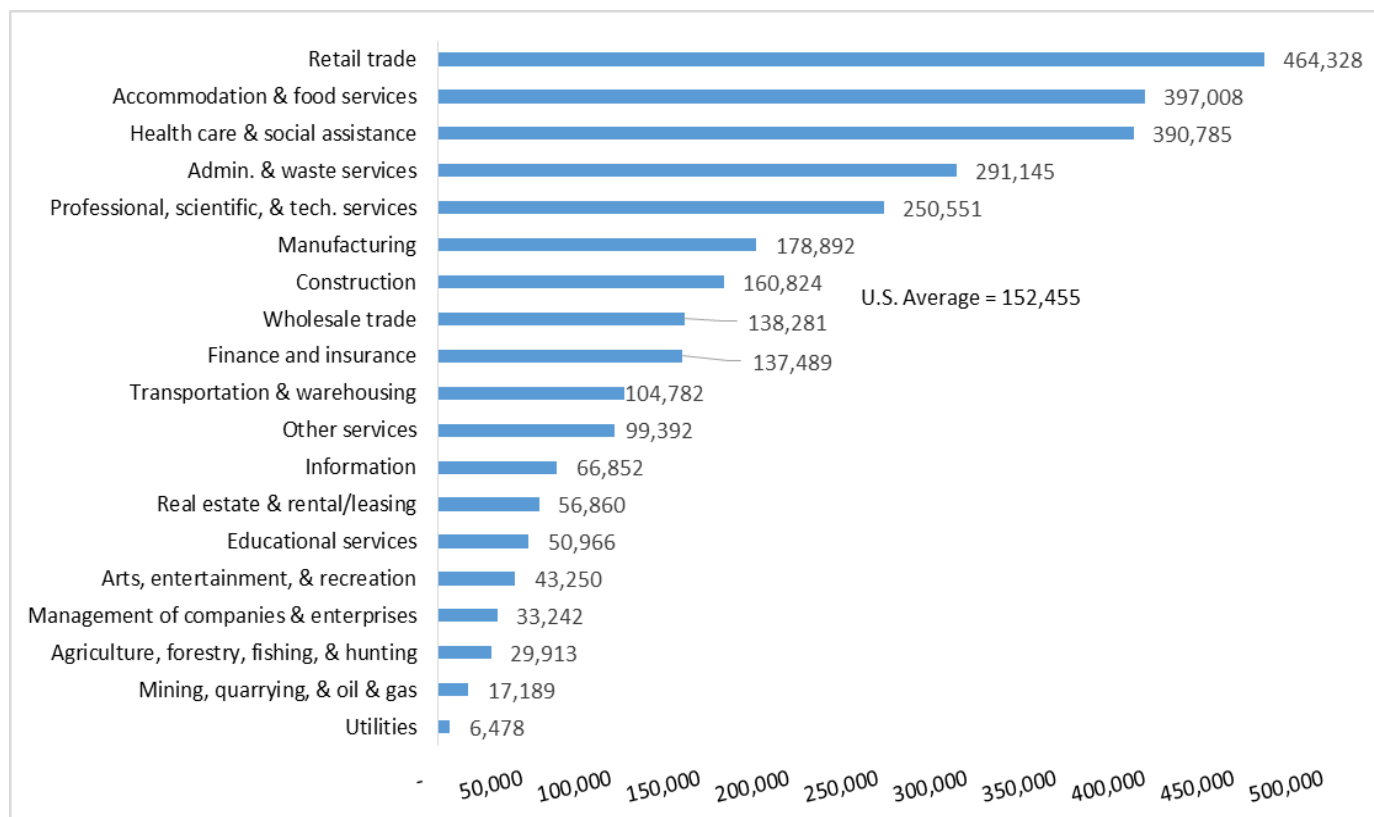


Source: Bureau of Labor Statistics Establishment Age and Survival Rates 2013

*Health Care is estimated based on 2010-2012 trend data due to 2013 data being an outlier

In looking at the 2013 employment of establishments started in 2003, the top three industries were retail trade, accommodation and food service, and health care and social assistance. These are the industries that tend to create more jobs than other industries. On the bottom of the employment scale were utilities, mining/quarrying/ oil and gas, and agriculture/forestry/fishing.

Figure 13. 2013 Employment for U.S. Establishments Started in 2003 by Industry



Source: Bureau of Labor Statistics, Establishment Age and Survival Rates 2013

While the BLS does not compile survival rates by industry for individual states, they do compile the number of establishments by industry for individual states. In looking at the number of establishments by industry, Hawaii's high establishment survival rate can partially be explained by the industry composition. As listed in Table 11, three of Hawaii's top five industries have above average establishment survival rates. These three industries, retail trade, health care and social assistance, accommodation and food service, comprise 34.5 percent of Hawaii's total

establishments and all have relatively high survival rates. Establishments in these industries, not only survive longer, but retain employment at a higher rate than other industries.

Table 11. Number and Growth of Establishments by Industry Category

	2013 No. of HI Estab.	% of Total	Avg. Ann. Growth 03-13	
			Hawaii	U.S.
Retail trade	4,432	12.2%	-1.0%	0.0%
*Professional, scientific, & tech. services	4,349	12.0%	1.4%	2.3%
*Health care & social assistance	3,733	10.3%	1.2%	7.5%
Other services	3,725	10.2%	-0.1%	-2.9%
Accommodation and food services	3,664	10.1%	0.8%	1.7%
Construction	3,404	9.4%	0.9%	-0.7%
Admin. & waste services	2,318	6.4%	-0.2%	1.8%
Wholesale trade	2,128	5.9%	-0.2%	0.5%
Real estate & rental/leasing	1,870	5.1%	-0.4%	0.8%
Finance and insurance	1,587	4.4%	0.5%	0.7%
Transportation & warehousing	964	2.7%	-0.1%	0.8%
Manufacturing	927	2.6%	-1.9%	-1.2%
*Educational services	679	1.9%	1.5%	3.7%
Information	670	1.8%	-0.5%	0.0%
Arts, entertainment, & recreation	613	1.7%	0.9%	1.4%
*Management of companies & enterprises	439	1.2%	1.5%	4.2%
Agriculture, forestry, fishing, & hunting	421	1.2%	-0.8%	-0.1%
Other	420	1.2%	n/a	n/a
Total	36,343	100.0%	0.3%	1.1%

Source: Bureau of Labor Statistics Database

*2003-2013 avg. annual growth rate of 1% or higher

Note: Utilities (NAICS = 22) and Mining & Oil/Gas Extraction (NAICS=21) are included in “other” due to number of establishments being less than 100

The total number of Hawaii establishments grew at an annual growth of 0.3 percent during the 2003-2013 period, which was substantially less than the overall U.S. economy’s annual growth rate of 1.1 percent. The industries with the highest establishment annual growth rates in Hawaii were management of companies and enterprises, educational services, and professional, scientific and technical services, and health care and social assistance; all of which had annual growth rates of 1 percent or higher during the 2003-2013 period. The growth of these industries

tended to reflect trends in the overall U.S. economy rather than Hawaii specific factors, as these industries showed strong growth at the national level also.

On the other hand, there were two industries that showed an annual decrease of 1 percent or more; manufacturing and retail trade. The number of manufacturing establishments in Hawaii declined 1.9 percent annually from 2003-2013, and this was even more severe than the national decline of 1.2 percent. The number of retail trade establishments declined 1 percent annually in Hawaii and this contrasted to the overall U.S. economy, which remained flat during this period. However, unlike manufacturing where jobs decreased along with establishments, Hawaii's retail industry actually increased jobs during this period. In other words, rather than a decline in the retail industry, there was a consolidation of establishments as large retailers gained market share at the expense of smaller mom and pop shops. The information and agriculture industry groups also had fairly large decreases, declining 0.5 percent and 0.8 percent respectively on an annual basis.

In summary, there is an inverse relationship between the number of years in business and the establishment survival rate. In Hawaii, 50 percent of establishments will not survive beyond the first 5.5 years in business. However, the survival rate varies depending the industry group of the establishment. The growth rate for establishments also varies by industry.

VI. SOLE PROPIETORS AND OTHER NON-EMPLOYER FIRMS

The previous section focused on business birth, death, and survival rates of establishments.

However, one problem with this BLS data is that it does not include business owners who work for themselves and do not have employees. This group of small business owners with no employees is called “non-employers” and they are a significant part of Hawaii’s entrepreneurial economy. The data is compiled by the Census Bureau from tax returns. Non-employers include sole proprietors, partnerships, and corporations that do not have employees. As shown in Table 12, Sole proprietors are the majority of non-employers with 88.5 percent of the firms and 69.2 percent of the revenue.

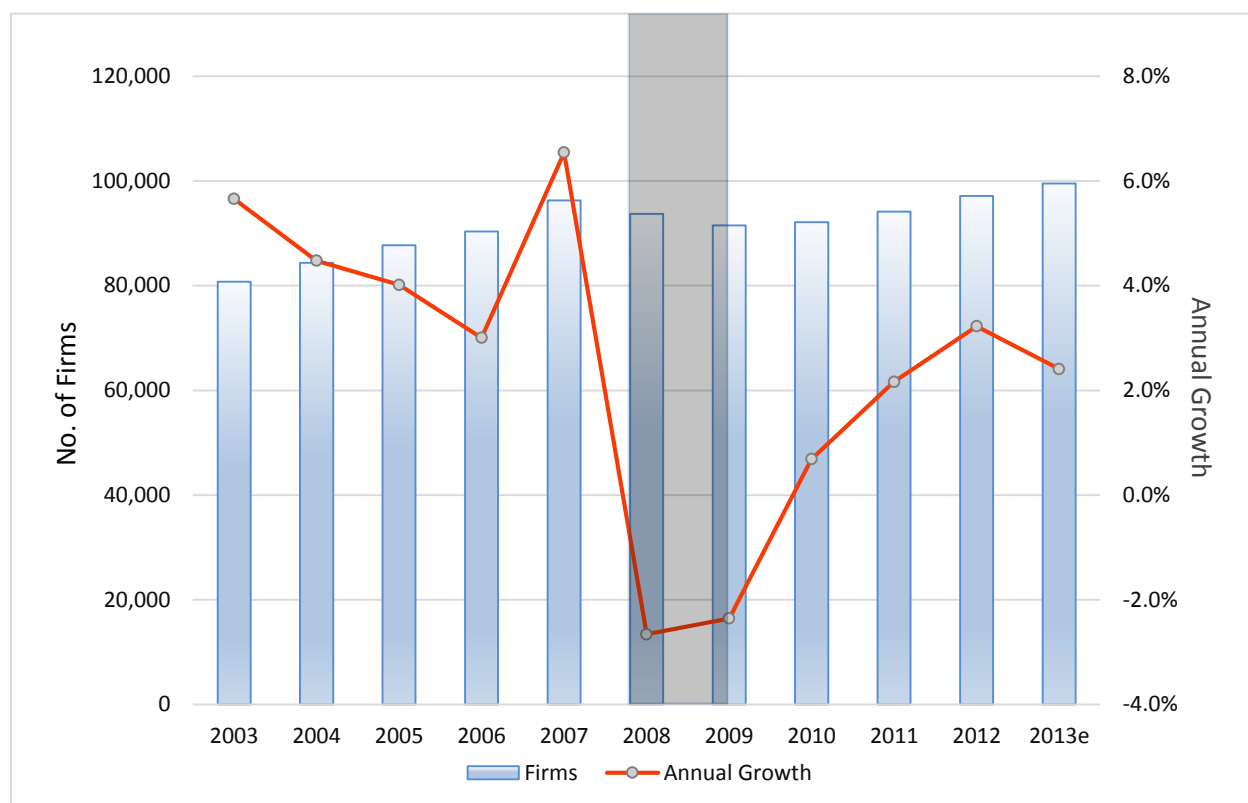
Table 12. Non-Employer Firms by Business Structure in 2012

Type of Business Structure	Firms (%)	Gross Revenue Thousands (%)
Individual Proprietorships	86,014 (88.5%)	3,146,295 (69.2%)
Partnerships	5,771 (6.0%)	769,789 (17.0%)
Corporations	5,366 (5.5%)	628,474 (13.8%)
Total	97,151 (100%)	4,544,558 (100%)

Source: U.S. Census Bureau, Non Employers Statistics

Non-employer firms have generally had strong growth in the past decade, with the exception of the recession (Figure 14). After a 6.5 percent increase in 2007, non-employer firms decreased 2.7 percent in 2008. The decline continued in 2009 and then levelled off in 2010. However, growth returned in 2011 and 2012, with the number of non-employer firms increasing 2.2 percent and 3.2 percent respectively. While 2013 data has not been released yet, the trend shows that the number of non-employers will approach 100,000 firms, well above the 2007 peak of 96,263.

Figure 14. Number of Firms and Annual Growth of Non-Employer Firms



Source: U.S. Census Bureau Non Employers Statistics

-shaded area is Great Recession from 12/2007 to 6/2009

In looking at the economic contribution of non-employers, in 2012 there were 97,151 non-employer firms that contributed \$4.5 billion in gross receipts to the state's economy. The top five industries for gross receipts of non-employers were real estate/leasing, professional/scientific/technical services, construction, other services, and retail trade (Table 13). While the BLS does not include this segment in their employment data, it is estimated that non-employer firms comprised 10 percent of Hawaii's private sector employment in 2013 (EMSI 2014).

Each industry varies substantially in the amount of gross receipts generated per firm. As shown in the table below, the top industries for gross receipts per firm are real estate/leasing, wholesale

trade, finance and insurance, mining/quarrying/other extraction, transportation and warehousing, and construction.

Table 13. Gross Receipts of Non-Employer Firms in 2012

Industry	Firms	Gross Receipts (\$000)	Gross Receipts per Firm
Real estate & rentals/leasing	11,106	\$ 939,232	\$ 84,570
Professional, scientific, & tech. services	14,299	\$ 601,694	\$ 42,079
Construction	7,262	\$ 457,014	\$ 62,932
Other services	15,204	\$ 438,780	\$ 28,860
Retail trade	9,512	\$ 429,651	\$ 45,169
Health care & social assistance	7,601	\$ 354,250	\$ 46,606
Finance & insurance	2,850	\$ 266,900	\$ 93,649
Admin. support, waste man., remediation service	8,145	\$ 221,473	\$ 27,191
Wholesale trade	2,624	\$ 185,155	\$ 70,562
Arts, entertainment, and recreation	6,044	\$ 167,285	\$ 27,678
Accommodation & food services	1,729	\$ 122,142	\$ 70,643
Transportation & warehousing	2,834	\$ 97,001	\$ 34,228
Manufacturing	2,163	\$ 88,861	\$ 41,082
Agriculture, forestry, fishing & hunting	2,034	\$ 79,823	\$ 39,244
Educational services	2,430	\$ 43,593	\$ 17,940
Information	1,165	\$ 42,521	\$ 36,499
Utilities	131	\$ 7,688	\$ 58,687
Mining, quarrying, and oil and gas extraction	18	\$ 1,495	\$ 83,056
Total for all sectors	97,151	\$4,544,558	\$46,778.29

Source: U.S. Census Bureau, Non Employers Statistics

VII CONCLUSIONS

This paper examined Hawaii's new business formation using data for establishment births, new establishments, establishment survival rates, and non-employer data that represent self-employed workers. Hawaii has a higher reliance on small business employment than the overall U.S. economy and, therefore, it is important to understand the rate at which establishments are adding to the small business foundation.

In looking at establishment births, the data showed that the number of establishment births have declined only slightly for both Hawaii and the U.S. during the 1994-2013 period. However, the employment created from establishment births declined dramatically for both the U.S. and Hawaii. This was caused by a sharp decline in the number of employees per establishment birth, as companies are starting with fewer people. In 1994, the average number of employees per establishment birth was 6.2 for the U.S. and 6.8 for Hawaii and, by 2012, these numbers had decreased to 3.9 and 3.8 respectively. The decline in employment per establishment birth can partially be attributed to the fact that technology has reduced dependence on labor. This highlights the paradox of productivity gains, as companies become more efficient, they need fewer people.

Another finding was that Hawaii trails the overall U.S. economy for both the percentage of establishment births and employment created from establishment births for the 1994-2013 period. However, Hawaii's establishment survival rate was higher than that of the overall U.S. economy during this period. In other words, Hawaii has lower birth rates but longer life spans for business establishments, when compared with the overall U.S. economy.

The U.S. data was segmented by industry and showed that survival rates vary widely by industry. In looking at establishments started in 2003, the industries with the highest survival rates in 2013 were management of companies, health care and social assistance, and agriculture/forestry/fishing. Hawaii's higher survival rate could partially be explained by the fact that Hawaii has a higher percentage of establishments in industries with higher survival rates. The analysis also showed that only fifty percent of Hawaii establishments survive to 5.5 years in business.

While the survival rate by industry is only available at the national level, the number of establishments by industry is available at the state level. For Hawaii, the total number of establishments increased from 35,394 in 2003 to 36,343 in 2013, a 0.3 percent average annual increase. The industries with the highest annual growth rates during this period were management of companies and enterprises (1.5%), educational services (1.5%), and professional, scientific and technical services (1.4%), and health care and social assistance (1.2%). The growth in these industries could be attributed to the overall growth trend at the national level, rather than Hawaii specific factors. It is important to note that, although the number of Hawaii's establishment grew at a 0.3 percent rate during the 2003-2013 period, this was still substantially below the national growth rate of 1.1 percent.

The data presented in this paper showed that Hawaii has a lower birth rate and growth rate for establishments, when compared to the overall U.S. economy. Overall, it benefits the economy to have a steady pipeline of quality new establishments to replenish those that disappear, especially in the traded sectors. The importance of increasing the birth rate for new establishments is even more important in today's economy because fewer jobs are being created per establishment.

Growing the birth rate of quality establishments today will create a solid foundation for the economy of tomorrow.

REFERENCES

- Bureau of Labor Statistics. 2014. Business Employment Dynamics Overview.
<http://www.bls.gov/bdm/>
- Bureau of Labor Statistics. 2014. Business Establishment Age and Survival Rates.
<http://www.bls.gov/bdm/bdmage.htm>
- Adelino, M. S. Ma, D.T. Robinson. 2014. Firm Age, Investment Opportunities, and Job Creation. National Bureau of Economic Research. Working Paper 19845. Cambridge, MA. January.
- Choi, E., J. Spletzer. 2012. The Declining Average Size of Establishments: Evidence and Explanations. Bureau of Labor Statistics. Working Paper 452. Washington, D.C. February.
- Census Bureau. 2012. Establishment Births, Deaths, and Employment by Sector and Firm Type-Startups, Young, and Mature Firms: 2009. Table 764
<https://www.census.gov/compendia/statab/2012/tables/12s0764.pdf>
- Census Bureau. 2014. Non-Employer Statistics Annual Data Series.
<https://www.census.gov/econ/nonemployer/>
- Economic Modeling Specialists International (EMSI). 2014. 2014.2 Class of Worker Data Set.
<https://www.economicmodeling.com>
- Headd, B. 2010. An Analysis of Small Business and Jobs. SBA Office of Advocacy. Washington D.C. March.
- Haltiwanger, J. 2006. Entrepreneurship and Job Growth. Social Science Research Network. October 1. <http://ssrn.com/abstract=1244668>
- Haltiwanger, J. 2012. Job Creation and Firm Dynamics in the U.S. November. Kauffman Foundation. Kansas City, MO. November.
- Neumark, D., B. Wall, J. Zhang. 2011. Do Small Businesses Create More Jobs? New Evidence for the United States from the National Establishment Time Series. Review of Economics and Statistics. Vol. 93. February.
- Robinson, C., B. O'Leary, A. Rincon. 2006. Business Startups, Closures, and Economic Churn: A Review of the Literature. National Institute of Economic and Social Research. London, UK. August.
- Sadeghi, A. 2008. The Births and Deaths of Business Establishments in the United States. Monthly Labor Review. Bureau of Labor Statistics. December.
- Small Business Administration. 2014. Summary of Size Standards by Industry Sector.
<http://www.sba.gov/content/summary-size-standards-industry-sector>