The Winter 2020 edition of the Economic Activity Report, published by the New Haven Economic Performance Laboratory, represents a collaborative and pedagogical effort by faculty and students of the Department of Economics and Business Analytics. It contains economic analyses that focus on the economic conditions of the New Haven Region and Connecticut. This Winter 2020 report (and previous reports) can also be found on the laboratory’s website (www.universityofnewhaveneconlab.org). The purpose of this report and future reports is to provide insights and guidance that will foster economic development and growth and a revitalization of the region’s and the state’s economy, spurring entrepreneurship and innovation.

This issue specifically contains certain economic data series analyzed by Department of Economics and Business Analytics Capstone students. This examination is intended to further student understanding of the regional economic climate and conditions while providing clear, understandable interpretations of its economic climate and conditions. The University of New Haven student analysts of today are our future analysts. Their names and email addresses are included. Please do not hesitate to contact them.

This publication builds upon our previous efforts to analyze Connecticut’s economy, as well as the Greater New Haven area, as compared with our neighboring states. In particular, the key performance indicator assessment for energy has been expanded to include an interview with the president of Connecticut-based Bigelow Tea about their reason for adopting an aggressive solar panel program to reduce high energy costs. As a point of reference, Connecticut has the highest electricity cost in the 48 contiguous United States.

In addition to visiting the Laboratory’s website, I invite you to visit another student initiative that involves posts, commentary, and noteworthy contributions from students, faculty, alumni, and members of the broader community: The Economics Collective (http://unheconomicscollective.ning.com). The Collective, as it is affectionately known, is a thought-leadership and learning space that fosters the integration of theory, technical competencies, real-life learning, and communication skills.

Kind regards,

Brian T. Kench, Ph.D.
Dean, College of Business
As reported in the last issue of the Connecticut Economic Activity Report (EAR), national economic performance continues to improve, as evidenced by the latest published unemployment rate of 3.2%. The general trend of the reported economic indicators is modestly positive, with the exception of energy, as shown in the dashboard below; housing prices have increased, which is encouraging, but they are still not up to pre-recession levels. The dashboard below summarizes the specific content and analyses produced by the College of Business Economics major students.

Students and faculty within the Department of Economics and Business Analytics continue to explore the disparity between Connecticut and other states in recovery from the Great Recession. According to the forecast of the Connecticut and the New Haven Region Economic Performance Index, the near-term prediction suggests a modest improvement as well.

In this publication, we begin to expand upon student research and analysis of existing Connecticut businesses with a timely article on Connecticut-based Bigelow Tea that focuses on energy costs in Connecticut and how Bigelow has managed to keep its energy cost in check while operating in the state with the fifth-highest electricity costs in the country.

We also build upon our analysis of venture capital investment in Connecticut as compared with the Tri-State Area (New York and New Jersey). Here we attempt to better understand Connecticut trends as compared to our neighbors, analyzing seed funding versus follow-on expansion investment.

Finally, we have added a new KPI on Connecticut’s aging infrastructure and how the state spends its dollars, compared with the rest of the country; Connecticut ranks 47th out of 50 states in road quality.

### Connecticut Performance at a Glance

<table>
<thead>
<tr>
<th>KPI</th>
<th>STATUS</th>
<th>FORECAST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connecticut Employment</td>
<td><img src="image" alt="Battery" /></td>
<td><img src="image" alt="Up" /></td>
</tr>
<tr>
<td>Real GDP</td>
<td><img src="image" alt="Battery" /></td>
<td><img src="image" alt="Down" /></td>
</tr>
<tr>
<td>Roadway Infrastructure Spending</td>
<td><img src="image" alt="Battery" /></td>
<td><img src="image" alt="Up" /></td>
</tr>
<tr>
<td>CPI — Energy</td>
<td><img src="image" alt="Battery" /></td>
<td>—</td>
</tr>
<tr>
<td>Economic Performance Index</td>
<td><img src="image" alt="Battery" /></td>
<td><img src="image" alt="Down" /></td>
</tr>
<tr>
<td>Housing Starts</td>
<td><img src="image" alt="Battery" /></td>
<td>—</td>
</tr>
<tr>
<td>Venture Capital Investment</td>
<td><img src="image" alt="Battery" /></td>
<td><img src="image" alt="Up" /></td>
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</tbody>
</table>
The New Haven Region Economic Performance Index (NHREP Index), recently updated in September 2019, measures the performance and strength of the economy in southern Connecticut, specifically the New Haven region.

The NHREP Index is comprised of five separate components: Education and Health Services for all employees in New Haven, CT, not seasonally adjusted; New Private Housing Units Authorized by Building Permits for Connecticut; Average Weekly Hours worked in New Haven, CT; Average Weekly Earnings in New Haven, CT; and Unemployment in (reversed) New Haven.

It should be noted that, unlike the data from prior reports, the data utilized for Education and Health Services is not seasonally adjusted because of the absence of reporting such information. While the reported data could be adjusted for seasonality, it was determined that such an adjustment would not produce a statistically significant different result. The unemployment average for 2019 has dropped to 3.7% from the 4.0% average of 2018 and fell from 3.5% to 3.4% from August to September. For the purposes of the index, however, the unemployment rate was reversed for analysis.

As Table 1 shows, the New Haven Region has experienced a 17.41% increase in performance over the past year with a 6.39% increase from the previous month. We see a large increase in building permits in both year-over-year and month-over-month at 13.06% and 27.13%, respectively. Both average weekly hours and earnings increased slightly year-over-year by 1.6% and 2.1%, respectively, showing a possible correlation between the two markers.

Our forecast, as reflected in Figure 1 and Table 2, predicts a decline for the remainder of 2019 which follows the trend of the past eight years and predicts a slight increase after the new year.

### Table 1

<table>
<thead>
<tr>
<th>Measurement</th>
<th>% change from previous month</th>
<th>% change from previous year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education and Health Services in New Haven, CT</td>
<td>+2.79</td>
<td>+3.44</td>
</tr>
<tr>
<td>New Private Housing Units Authorized by Building Permits for Connecticut</td>
<td>+27.13</td>
<td>+13.06</td>
</tr>
<tr>
<td>Average Weekly Hours Worked in New Haven, CT</td>
<td>+0.8%</td>
<td>+1.6%</td>
</tr>
<tr>
<td>Average Weekly Earnings in New Haven, CT</td>
<td>+1.88%</td>
<td>+2.1%</td>
</tr>
<tr>
<td>Unemployment for New Haven</td>
<td>-.1%</td>
<td>-.3%</td>
</tr>
<tr>
<td>NHREP Index</td>
<td>+6.39%</td>
<td>+17.41%</td>
</tr>
</tbody>
</table>

### Table 2

<table>
<thead>
<tr>
<th>DATE</th>
<th>POINT FORECAST</th>
<th>LO 80</th>
<th>HI 80</th>
<th>LO 95</th>
<th>HI 95</th>
</tr>
</thead>
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<tr>
<td>OCT-19</td>
<td>231.108</td>
<td>193.039</td>
<td>275.612</td>
<td>177.961</td>
<td>289.024</td>
</tr>
<tr>
<td>NOV-19</td>
<td>228.678</td>
<td>193.485</td>
<td>265.533</td>
<td>178.359</td>
<td>282.613</td>
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<tr>
<td>DEC-19</td>
<td>230.182</td>
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<td>266.728</td>
<td>178.749</td>
<td>284.142</td>
</tr>
<tr>
<td>JAN-20</td>
<td>227.827</td>
<td>194.358</td>
<td>267.910</td>
<td>178.689</td>
<td>287.147</td>
</tr>
<tr>
<td>FEB-20</td>
<td>230.203</td>
<td>194.785</td>
<td>269.082</td>
<td>177.695</td>
<td>288.625</td>
</tr>
</tbody>
</table>

Data are from the Federal Reserve Bank of St. Louis FRED data (https://fred.stlouisfed.org)
As represented in the chart, housing prices peaked in the New Haven-Milford Area immediately before the Great Recession at approximately $220,000. The mean housing price continued to fall to its lowest point in the second quarter of 2014 with $171,000, a decline of 22.28%. Since the third quarter of 2014, the mean housing price has not experienced two quarters of decline, and as of the second quarter of 2019, the mean housing price is approximately $188,000, an increase from the past but still lagging behind the 2007 peak by over $30,000 or approximately 14.54% lower. When comparing the data from New Haven-Milford with that of Bridgeport-Stamford-Norwalk the results are similar. Bridgeport-Stamford-Norwalk’s housing market peaked in the second quarter of 2006, and since the first quarter of 2007, the mean housing price has dropped by over $30,000, from $239,170 to $208,100, in the second quarter of 2019, a decline of 12.99%. Since the second quarter of 2019, the mean housing price has increased.

Data are from the Federal Reserve Bank of St. Louis FRED data (https://fred.stlouisfed.org/series/ATNHPIUS35300Q), (https://fred.stlouisfed.org/series/ATNHPIUS14860Q).

Michael Reddy '20
Major: Economics
Hometown: Forest Hills, New York
Connecticut’s unemployment rate has steadily decreased since March 2019 to 3.6%, a rate not seen since 2002. It is currently on par with the abnormally low national unemployment rate. This is below what is considered to be the natural rate of unemployment, which suggests that both the state and the nation are doing well with respect to employment. Connecticut’s unemployment rate remains higher than that of Massachusetts, which is at a rate of 2.9%. Rhode Island’s unemployment is the same as Connecticut’s, with New York State lagging Connecticut with a rate of 4.0%.

This positive trend could continue into the foreseeable future. Of particular note is the latest contract award to General Dynamics Electric Boat Corporation, a subsidiary of General Dynamics. This contract awarded Electric Boat $2 billion for its production of submarines for the U.S. Navy. In early 2019, Jeffrey Geiger, the company’s president, announced that the company anticipates hiring 900 people in Connecticut by the end of 2019. The company has also recently signed the largest contract ever awarded by the Navy, $22.2 billion to build nine more nuclear-powered Virginia-class submarines, plus the option for a tenth submarine within the next five years. This 10th submarine, if built, will increase the contract to $24 billion. This bodes well for skilled trade workers and the job market in Connecticut; the company expects this project to require the expertise of thousands of workers.

Data are from the Federal Reserve Bank of St. Louis FRED data (fred.stlouisfed.org).
In 2019 Connecticut’s Real GDP fluctuated during the first and second quarters. The Real GDP went from 4.3% down to 1.3% in the second quarter. These data are from the Bureau of Economic Analysis. The updated data show that Connecticut is ranked at 47th out of the 50 states. Looking at forecasted data shows that there should be an increase in Real GDP for the quarters to come. There has been a lot of growth since 2018, and hopefully it stays positive from now on.
Connecticut has the fifth-highest consumer electricity costs per kilowatt hour (kWh) in the nation. Connecticut’s price of 21.29 cents/kWh is more than double that of Louisiana, the most inexpensive state, which comes in at 9.57 cents/kWh, and more than the U.S. average of 13.30 cents/kWh. Connecticut increased prices 0.9% between July 2018 and July 2019, while the national average decreased 1.1% over the exact same timeframe. Connecticut gets its energy from both electricity and natural gas. The generation of electricity is extremely concentrated with a single nuclear power plant supplying 62% of the state’s electric, 30% is natural gas-generated electricity, and 8% comes from coal. Nuclear generation overall is cheaper than fossil steam and gas turbine, according to the EIA, so the regulation in place may be what is causing the spikes in prices. The push to transition to renewable energy (27% by 2020) is a cost borne by both infrastructure and generation. Yet another interesting fact about electricity generation, which applies to not just Connecticut but the entirety of the country, is just how inefficient electricity generation is. Nearly one third of all electricity generated is wasted. This waste is caused by several factors, including line drop and loss through heat. This is a huge factor when considering that most of Connecticut’s energy is strictly electric, and an even larger factor in considering our efficiency in the worldwide market.

One major factor affecting Connecticut power rates is the system of decoupling. Decoupling is a regulatory policy that differs from traditional economics by disassociating utility companies’ profits from the amount of energy they sell. This system is practiced in nearly half of the country on some level. In a traditional system, revenues are a result of the rate times the amount of energy sold or total sales. In a decoupled system, a governing body sets the rates based on projected revenues the utility companies calculate in a “rate case.” The decoupling system is meant to be used as a tool to allow utility companies to maintain reasonable revenues while not encouraging more energy use from its customers. Instead the companies focus on being green and minimizing usage. This is in step with the push for renewable energy in Connecticut, which includes other policies such as the establishment of the Clean Energy Fund.

Table 3: Lowest Rates

<table>
<thead>
<tr>
<th>STATE</th>
<th>CENTS/KWH</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOUISIANA</td>
<td>9.57</td>
</tr>
<tr>
<td>WASHINGTON</td>
<td>10.06</td>
</tr>
<tr>
<td>ARKANSAS</td>
<td>10.08</td>
</tr>
<tr>
<td>IDAHO</td>
<td>10.18</td>
</tr>
<tr>
<td>OKLAHOMA</td>
<td>10.61</td>
</tr>
</tbody>
</table>

Table 4: Highest Rates

<table>
<thead>
<tr>
<th>STATE</th>
<th>CENTS/KWH</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAWAII</td>
<td>31.16</td>
</tr>
<tr>
<td>ALASKA</td>
<td>23.56</td>
</tr>
<tr>
<td>RHODE ISLAND</td>
<td>21.76</td>
</tr>
<tr>
<td>MASSACHUSETTS</td>
<td>21.54</td>
</tr>
<tr>
<td>CONNECTICUT</td>
<td>21.29</td>
</tr>
</tbody>
</table>
Bigelow — A Champion for Connecticut

One company that is excelling despite high prices is Bigelow Tea. Bigelow, founded in 1945, is family owned and determined to stay in its home state of Connecticut. While they have been creating and perfecting their delicious teas for three generations, the company has also worked diligently to become sustainable in all aspects of its business. The Bigelow company is proud to still hold most of its manufacturing operations right here. The transformation began 10 years ago, when Connecticut established the Clean Energy Fund. This allowed Bigelow a fiscally viable way to pursue solar energy, and the project resulted in ~10% renewable power generation for the company. Since then, the proactive Fairfield-based company has partnered with Globele Energy in New Haven to conduct improvements that make the first experiments pale by comparison. Robert Hendrick, vice president of corporate responsibility, takes no credit for himself, giving it to his team of brilliant engineers like John Bruin, Facility Manager Taylor Bova, and wise consultation from Globele. Together, they have reduced consumption at the Fairfield plant by about 825,000 kWh per year. What does Bigelow do with the savings? Reinvest in other energy endeavors such as a state-of-the-art roof on their facility in Boise, Idaho, that has a special reflective membrane to save energy; LED bulbs in facilities that save power, decrease maintenance costs, and increase productivity; higher efficiency equipment; and a custom-designed system that takes waste heat from the manufacturing process and reuses it for heating. In fact, Bigelow is on track to become 100% renewable. However, for companies such as Bigelow that want to play their part in being sustainable, both Bigelow and Globele agree the Clean Energy Fund plays a large role in their ability to pursue renewable energy. The fund offsets a significant part of the initial costs of becoming more efficient, especially when performing comprehensive projects with multiple projects incorporated into energy savings. While this fund is generated by the taxpayers, the jobs supplied and contribution to the state GDP are significant. The return it provides to them by keeping loyal Connecticut businesses such as Bigelow operating is invaluable.

www.instituteforenergyresearch.org/states/connecticut/
www.ase.org/resources/utility-rate-decoupling-0
www.eia.gov/electricity/annual/html/epa_08_04.html
www.eia.gov/todayinenergy/detail.php?id=41093

www.chooseenergy.com/electricity-rates-by-state/
www.eia.gov/state/seds/archive/#2000
www.c2es.org/document/decoupling-policies/

Zachary Westfahl ’20
Major: Behavioral Economics
Hometown: Fond du Lac, WI
In 2018, Connecticut was ranked sixth in venture capital raised, totaling $487.10 million. Connecticut Innovations is the largest venture capital firm in Connecticut, announcing that in the 2019 fiscal year it will have invested $39.4 million across 108 transactions. Venture capital funds are equity investments in a company whose stock is considered worthless until the company matures. Venture capital investments are not only monetary; they can come in other forms, such as expertise. Venture capital investments can generate high-skilled jobs and trillions of dollars for the U.S. economy.

Figure 8, which includes data from 2013 to the present, indicates that both New York and Massachusetts have been investing less compared with previous years, whereas Connecticut has already spent more.

The anemic performance since the 2008 Great Recession is apparent in the seed stage for number of deals, while the early stage and expansion stage show greater performance than expected.

Figure 10, for the amounts, shows similar trends in number of deals. The early stage shows to be lacking and the seed stage is taking a greater hit. Despite the fact that the other stages are performing below expectations, the expansion stage is greater than expected.
The bubble charts (Figure 12 and Figure 13) convey three key metrics for each investment stage: (i) the measure of strength of investment in Connecticut relative to the nation; (ii) the rate of change, or the growth rate of the particular investment stage; and (iii) the number of deals or the amounts invested, as the case may be — the relative size of the bubble. The focus period, or the end points, were selected based upon the recent recession. For simplicity, the construct illustrated in the figure assists in evaluating investment stage performance.

Figure 13 illustrates that the seed stage, early stage, and expansion stage are all strong. Despite lacking expectations as determined in the location quotient, the seed stage is shown to be advancing. As for the other stages of investment, they are strong but declining. A similar pattern is shown in invested amounts for the seed stage and early stage. The expansion stage is strong and advancing. An emerging early stage of amounts invested and number of deals activity could bode well for the future, provided Connecticut continues to foster and support these enterprises during all stages.

In sum, the trends associated with the general activity of traditional venture capital shows that venture capital appears strong in Connecticut. Amounts invested appears strong, despite falling short of expectations set during the 2008 Great Recession. The expansion stage appears to be advancing and exceeds expectations.

PwC/CBInsights MoneyTree™ data explorer, http://www.pwc.com/moneytree

Brynn Slicer ’20
Major: Economics and National Security Studies  Hometown: Newark, Delaware
Connecticut has been ranked 47th in roadway infrastructure consistently between 2018 and 2019; the American Society of Civil Engineers has given the state’s roadways a D+ grade. There are many factors contributing to this continuous grade, including roadway condition, spending, maintenance, and capacity, making Connecticut’s infrastructure issue a unique situation.

Connecticut has the sixth-highest population density in the country and the third-busiest roadway network in the country. Of the almost 20,000 miles of public roadways in Connecticut, more than 50% are 55 years old or older; of all roadways, 80% are considered to be either in poor (57%) or mediocre (22%) condition. Of the $41.22 billion available in the state’s total operating expense budget, only 3.82% ($1.57 billion) was spent on transportation-related expenses throughout the 2019 fiscal year. While this is a .15% increase from $1.48 billion spent in 2018, the breakdown of these funds showed that only about 44% ($693 million) of the allocated money was being spent on transportation services; a further breakdown shows $405 million of that money was spent on bus and rail line services.

Connecticut’s consistent recurring issue has been budgetary shortfalls and a lack of available funding for both maintaining current roadways and fixing larger issues. Of the 20,000 miles of roadway, 81% are funded by cities and towns. While federal funds have seen a consistent increase and the quality of the pavement of state roads and highway systems improves, the lack of appropriate maintenance will make it more expensive to repair the roadways in poor condition in the long run. Federal funds are not flexible enough to allow the state to make repairs and work on newer projects quickly and efficiently.

The Connecticut Department of Transportation has estimated that the state would require close to $30 billion to provide drivers with fair or good expectations within a 30-year timespan. Governor Malloy’s 30-year, $100 billion payment plan, “Let’s Go CT,” was ratified in 2016 and included a five-year, $2.8 billion “Ramp-Up” program designed to address many of the state’s most glaring issues at the moment. Despite these significant steps forward, much of the auxiliary funding for infrastructure has been absent as the CTDOT struggles to find necessary basic budgeting funding. Tolling stations would be beneficial for drawing in short-term funding and would allow the nearly 40% of out-of-state commuters to contribute to the well-being of the state. While tolling is a very divisive issue, there is no doubt that tolling would allow Connecticut to begin working toward the repairs that it has desperately needed to improve the lives of its citizens.
Figure 15: Transportation Infrastructure Capital Plan Report 2019–2023

www.infrastructurereportcard.org/state-item/CONNECTICUT/ — ASCE CT Report Card 2018
https://openbudget.ct.gov/ — CT Spending & Budget Breakdown

Austin Ferentzy ’20

Major: Behavioral Economics
Hometown: Easton, Connecticut
The University of New Haven Economics Collective is an online space where faculty, students, and business industry leaders can connect and network by sharing content, whether it be report analysis, political commentary, or anything else on their mind. Members can comment on each other’s posts, creating a meaningful and enriching dialogue that extends beyond the traditional classroom educational experience. On the Collective, all members are economists, whether the poster is a freshman student or a Nobel Prize winner. The lines of stature are blurred through the medium of the internet, lending to a more thoughtful and genuine discussion. These moments of connectivity construct social capital, which helps build up the Economics Department as more than an office of the University of New Haven, rather making it a community or people who care for one another beyond the academic setting. The Collective has already been used as a method of surveying and will be used as such in the future to further employ the method of using the wisdom of crowds. Visit the collective at http://unheconomicscollective.ning.com.
ABOUT THE NEW HAVEN ECONOMIC PERFORMANCE LABORATORY

The Connecticut Economic Activity Report is a publication of the Department of Economics and Business Analytics, College of Business, University of New Haven, 300 Boston Post Road, West Haven, CT 06516.

www.universityofnewhaveneconlab.org

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The research staff are upper-class students in the Department of Economics and Business Analytics. Although all students work under the auspices of the supervising faculty and research directors, each student is individually responsible for interpreting and analyzing the data. The Laboratory is a teaching space, and this report is a product of that space. In addition, staff members work closely with the University of New Haven Economic Collective (http://unheconomicscollective.ning.com), which brings together students, faculty, alumni, and members of the broader community to foster a meaningful and relevant exchange of ideas. A fundamental focus of the Laboratory is to formulate, construct, and examine non-traditional socioeconomic metrics applicable to the southern region of Connecticut by employing traditional empirical methods as well as data and text-mining methods.

The Connecticut Economic Performance Laboratory is affiliated with the University of New Haven Department of Economics and Business Analytics. Any opinions contained herein do not reflect the opinion of the University of New Haven or its College of Business. The funding of the Laboratory and the printing of the report are funded by the College of Business, the College of Business Advisory Board, and other sponsors of the Laboratory. If you are interested in supporting this student initiative, please contact Ms. Kimberly Williams, Director of Development, University of New Haven, at kpwilliams@newhaven.edu or +1.203.923.7143.
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AACSB accreditation means that our College of Business has met a rigorous set of standards. Graduates from AACSB-accredited schools are recognized and generally receive higher, more competitive salaries.

About the University of New Haven

The University of New Haven, founded on the Yale campus in 1920, is a private, coeducational university situated on the coast of southern New England. It’s a diverse and vibrant community of more than 7,000 students with campuses across the country and around the world.

Within our colleges and schools, students immerse themselves in a transformative, career-focused education across the liberal arts and sciences, fine arts, business, healthcare and health sciences, engineering, public safety, and public service. More than 100 academic programs are offered, all grounded in a long-standing commitment to collaborative, interdisciplinary, project-based learning.

At the University of New Haven, the experience of learning is both personal and pragmatic, guided by a distinguished faculty who care deeply about individual student success. As leaders in their fields, faculty provide the inspiration and recognition needed for students to fulfill their potential and succeed at whatever they choose to do.