

# Public Higher Education's Role in Shaping a Workforce in Rhode Island: The Case of Rhode Island College

Francis J. Leazes, Jr. & Mikaila Mariel Lemonik Arthur  
(Rhode Island College)

## Executive Summary

Skilled human capital plays a major role in sparking innovation, enhancing productivity, raising incomes, and driving economic growth. State prosperity depends heavily on attracting well-educated workers because these workers enjoy significantly higher per-capita incomes and perform well on other economic measures. The knowledge-based economy places a higher premium on an education that challenges those entering the workplace to be able to think beyond the immediate job they will seek. If the most desirable high-value technical businesses cannot find enough skilled workers in Rhode Island, they will neither come to the state or stay in it. Furthermore, in today's economy, we cannot attract individual business entities, but instead must attract and nurture a web of industries that together represent robust economic sectors. A mix of development incentives, not relying solely on tax policy, is necessary to build such economic sectors, especially due to the importance of education and quality of life amenities play in business location decisions.

Therefore, this case study analysis offers Rhode Island policymakers, for the first time, an in-depth look at how Rhode Island College has, and is, preparing students for the future. Rhode Island College is the appropriate case for this analysis because it is the college which educates Rhode Islanders, and thus plays a central role in enhancing the educational attainment of Rhode Island's workforce and its desirability.

More than two-third of students graduating from Rhode Island College are still in Rhode Island a year after graduation, and the majority either stay in Rhode Island for their entire careers or leave for a time and return. In contrast, the vast majority of students at Rhode Island's private colleges and universities—nearly all of whom are from out-of-state—choose to leave after graduation. Rhode Island is the state with the third highest proportion of college students enrolled in colleges and universities in the state who are not originally from the state. This greater proportion of college students who are not from our state clearly reduces the proportion who are likely to stay after graduation.

Across the country, students who stay in the same state for high school and college are likely to remain in that state post-graduation, and this is true in Rhode Island as well. Similarly, students who leave Rhode Island to go to college generally do not return, as is the case in other states across the country. Research clearly demonstrates that it is difficult to entice students who have left the state to return, and it is also difficult to entice out-of-state students to remain—merit scholarships that encourage students to attend college in-state do not even do the trick.

Alumni who earned advanced degrees were considerably more likely to leave Rhode Island. By 10 years post-graduation, the majority of RIC graduates enroll in an additional post-secondary degree program of some kind. The largest single destination for these students is graduate work at RIC.

Additionally, 67.2% of Rhode Island College graduates in this study have jobs closely related to their RIC degree.

Attaining post-baccalaureate education has grown in importance. Incomes of people holding graduate degrees have increased much more than other people's incomes. Rhode Island has a particularly high concentration of jobs requiring graduate degree attainment. There are some differences among college graduates which do occur in terms of college major. It is indeed true that there are more job openings for welders than for philosophers—but philosophy majors are intellectually skilled and flexible enough to seek a wide variety of careers. This means that even though the job market for philosophers may be tight, philosophy majors earn higher pay than do welders—about \$5,000 more a year in entry-level jobs. This gap grows across the life course. These findings highlight the importance of considering both short-term and long-term time horizons in accessing career and economic returns to higher education.

The desire to engage with higher education as a partner in addressing economic development activities occurs at a time when financial support for public higher education has been wilting. Our findings show that the best way to increase the educational attainment of the labor force in Rhode Island is by providing more robust support to the institutions educating Rhode Island residents. Rhode Island College's role in economic development would seem to be to nurture within our students' innovation, creativity, and career building capacity, while at the same time ensuring students do have the technological and other necessary skills to compete in a global, not just local, economic environment.

Our findings also suggest that many of the typical measures of college outcomes are not well-suited to supporting the development of a highly-educated labor force. The federal parameters for the calculation of graduation rates do not take into consideration many of the types of students who are common in comprehensive colleges like Rhode Island College today (such as low-income, first-generation students), and time-to-graduation is slowed by declining fiscal resources at public colleges. A considerable volume of research suggests that performance funding policies generally do not have a significant positive impact on graduation rates at public four-year colleges or on overall bachelor's degree attainment rates in states with such policies and could cause the opposite to occur. The limitations of federal graduation rate statistics point to the importance of considering other measures of educational outcomes such as overall educational attainment rates within a state or outcomes measured on the student rather than entering class level.

## Introduction

As the recent [“Rhode Island Innovates” report](#) (Battelle Technology Partnership Practice 2016) makes clear, maintaining and expanding Rhode Island's population of highly-educated workers is essential for achieving growth in advanced economic sectors. Rhode Island policy makers are challenging themselves to design solutions for an economy in stress. That stress is not just a product of the Great Recession that began in 2008, but that economic period laid bare some of the policy challenges facing the state. A national and global economy where financial and human capital are mobile, the loss of manufacturing jobs, and a concomitant rise in knowledge sector professions has resulted in the need for a broadly educated and specifically skilled workforce, and this workforce is seeking a robust paycheck, a place to live which offers a high quality of life, and the opportunity to use what they know on the job. Richard Florida argues that an entirely new class of individual, the *Creative Class*, has emerged as a driver of an economy that harnesses human resources and talent (Florida 2003).

Our approach to this study is rooted in understanding the role of public higher education in helping mitigate the economic challenges facing the state and in producing the workers who will drive the state's economy in the future. Because the Rhode Island College student body is overwhelmingly made up of Rhode Islanders, including a mix of students who enroll directly at RIC and others who transfer from CCRI, and because, as this report demonstrates, they tend to stay in Rhode Island after graduation, this case study analysis offers Rhode Island policymakers for the first time an in-depth look at how this public institution has prepared and is continuing to prepare students for the future. Rhode Island College's role in economic development is to nurture within our students innovation, creativity, and career-building capacity, while at the same time ensuring students have the technological and other skills to compete in a global—not just local—economic environment.

This analysis begins with two related research questions:

- 1) How can Rhode Island increase the educational attainment of the labor force?
- 2) How can Rhode Island minimize “out-migration” by increasing opportunities for students to develop connections with companies in Rhode Island?

### *The Rhode Island Economic Development Context*

A blizzard of reports and analysis has recently been produced focusing on the state and future of the state's economy. None are greeted passively: advocates and critics engage in passionate debate about them. An example is RhodeMap RI, a HUD-funded long-range planning effort of the RI Division of Planning in 2013-2014, ostensibly to help communities and regions “foster a more sustainable economy by coordinating planning and investment in housing, job creation, workforce training, and transportation” (Rhode Island Statewide Planning Program 2014:iv, 4).

RhodeMap RI's economic development goal, in part, is to develop “more targeted workforce education and training to match current and future workforce needs as well as to provide both soft skills and technical skills training to ensure job success” and “a public education system that consistently prepares students throughout the state for success” (Rhode Island Statewide Planning Program 2014:iv). The Rhode Map details the educational levels of Rhode Island's population as a focus of economic development:

*“While Rhode Island leads New England in the share of residents who are college or graduate students, it lags behind most others in the share of residents 25 and older who hold high school degrees and college degrees. This suggests that the state faces a ‘brain drain’ challenge.... Compared with the United States, adults in Rhode Island are more likely to have an education that fell short of a high school diploma or equivalent (15.2% of adults 25 and older in the state, versus 14.1% of adults nationwide). On the other hand, 31.1% of Rhode Island adults have a bachelor's or graduate degree, versus 28.5% of the nation's adults” (Rhode Island Statewide Planning Program 2014:19).*

The report laments that Rhode Island falls behind other states in New England on educational attainment indicators: “In every other New England state, a greater share of adults has earned at least a high school diploma than in Rhode Island, and in every New England state except for Maine, a greater share of adults holds a bachelor's degree.” The report points out the correlation between poverty and educational attainment: the poverty rate for those with a high school diploma is 13.9% and with a Bachelor's degree is 3.5%, and the growing ethnic diversity of Rhode Island makes attending to this disparity even more important. “By 2018, 42 percent of jobs will require an associate's degree or higher, but only 21 percent of U.S.-born Latinos, 15 percent of Latino

immigrants, and 30 percent of African Americans had that level of education as of 2010” (Rhode Island Statewide Planning Program 2014:19).

The most recent report designed to guide Rhode Island through an economic transformation also emphasizes similar themes regarding economic development and higher education. “Rhode Island Innovates: A Competitive Strategy for the Ocean State” (January 2016) prepared by Battelle Technology Partnership Practice in association with the Metropolitan Policy Program at Brookings with support from Monitor Deloitte and TEconomy Partners, LLC, devotes one section of their comprehensive report to Arts, Education, Hospitality, and Tourism as the largest growth area in Rhode Island, one that adds new jobs to the more than 40,000 already in the sector, a 38 percent higher industry concentration than the nation (Battelle Technology Partnership Practice 2016).

The report asserts that higher education is expected to make strong gains through 2022:

*“Rhode Island is a small state with a broad mix of higher education institutions that attract students from outside the state. The strength of higher education as an economic driver in Rhode Island is demonstrated by the fact that the state has a 158 percent higher industry concentration in private colleges and universities than the nation, with total employment of over 11,000 jobs. Furthermore, BLS projects that annual job growth in higher education will increase at a healthy 2.2 percent annually from 2013-2022” (Battelle Technology Partnership Practice 2016:75).*

Rhode Island College is clearly in that mix: RIC has the second-largest 4 year college student population in the state, trailing only the University of Rhode Island.

This report supports the theses that the emergent knowledge-based economy has changed some of the incentives for employment in a location as well as that change comes as a natural outgrowth of higher education. Rhode Island has built up critical elements of a strong quality of life: several national and international indexes rank the state highly for its general quality of life—a key factor in attracting and retaining talented workers. Rhode Island has a clear economic edge in this regard: numerous publications have recognized the state and its capital for their quality of life, cultural desirability, and attractiveness as destinations. Furthermore, Providence’s arts and culture scene generates substantial economic activity, more on a per-capita basis than many larger cities such as Atlanta, Baltimore, and San Francisco (Battelle Technology Partnership Practice 2016:93). In 2010, nonprofit arts and culture organization spend almost \$84 million and attracted an additional \$106 million in spending by audience members, a total of \$190 million in economic activity which directly supported over 4,600 jobs (Battelle Technology Partnership Practice 2016:93). As these figures show, arts (and higher education) are economic sectors that contribute to the location-based amenities available in Rhode Island, are desirable to skilled workers, and serve as opportunity industries. For instance, Trade Area Systems, Inc. recently announced a move to Providence specifically because of the location’s capacity to facilitate the recruitment of “highly -skilled young professionals” (MacDonald 2016).

The Brookings Report echoes Rhode Map RI regarding the state’s educational attainment, noting that among New England state, Rhode Island has the smallest percentage of the population with a bachelor’s degree and the second-lowest graduate and professional degree attainment (Battelle Technology Partnership Practice 2016:97). This demographic feature of Rhode Island presents the

state with a paradox: Rhode Island has seen strong job growth in both high- and middle-skill jobs<sup>1</sup>, but simultaneously struggles to keep up with the demand for educated workers (Battelle Technology Partnership Practice 2016:98). Between 2014 and 2009, the share of the Rhode Island population with only a bachelor's degree actually declined, while postsecondary educational attainment in all other New England states grew during this period (Battelle Technology Partnership Practice 2016:99). Furthermore, if this lack of educational attainment limits the ability of high-value businesses to hire skilled workers in Rhode Island, such businesses will not establish or maintain operations here (Battelle Technology Partnership Practice 2016:101-02).

This report reflects some key themes of Governor Raimondo's Economic Development Budget Proposal (FY16), which contains a mixture of strategies designed to attract businesses to the state, including . the use of tax credits and subsidies designed to encourage industry clusters, the provision of capital for investment, and efforts to retain workers who have attended Rhode Island institutions of higher education (Rhode Island Public Expenditure Council 2015).

The budget proposal include a Competitive Student Loan Reimbursement Fund to be administered by the Rhode Island Commerce Corporation, the purpose of which is to reimburse up to 100% of student loan repayment expenses over four years for graduates earning an associates, bachelors, or graduate degree in environmental science, computer technology, engineering, or medicine. In order to be eligible for this program, graduates must reside in Rhode Island throughout the four-year period and work a minimum of 35 hours per week for a Rhode Island employer. Two thirds of those who benefit from this program must be permanent residents of Rhode Island *or* have attended an institution of higher education in Rhode Island (Rhode Island Public Expenditure Council 2015:14). The budget proposal also includes an initiative to encourage partnerships between high schools, the Community College of Rhode Island, other institutions of higher education, and employers to offer courses leading to high school diplomas and associate degrees (Rhode Island Public Expenditure Council 2015:14).

Another portion of the budget proposal would provide funds for businesses with fewer than 500 employees to purchase research assistance from the state's colleges and universities. This program would allow small businesses to apply \$5,000 to \$50,000 to purchase services including research, technological development, product development, commercialization, market development, technology exploration, and improved business practices (Rhode Island Public Expenditure Council 2015:16). An innovation network program would provide matching grants to non-profit and for-profit enterprises offering technical assistance, capital, or space to businesses in industries such as life sciences and healthcare, food, agriculture, clean technology, energy efficiency, and cybersecurity (Rhode Island Public Expenditure Council 2015:16).

The budget proposal's inclusion of a mix of development incentives, not relying solely on tax policy, echoes the changing context of development policy, specifically the importance that education and quality of life amenities play in business location decisions. This change in the emphasis of location incentives for businesses addresses a theme developed in the literature on business location decisions. Research from the 1970s through the early years of the new millennium indicates that state and local governments continued to use tax incentives as their principle tool for impacting

---

<sup>1</sup> High-skill jobs are defined as those requiring workers to hold a bachelor's degree or higher, while middle-skill jobs require the attainment of some post-secondary credential such as a certificate or associate's degree.

business location decisions, despite clear findings indicating that tax incentives achieve mixed results (Buss 2001).

INSERT PHOTOGRAPH OF ALEX & ANI HALL HERE

### *The Rhode Island Higher Education Policy Context*

Recent analysis of trends across the country by the State Higher Education Executive Officers Association (SHEEO) and by the National Association of State Budget Officers (NASBO) make it clear that state budget support for higher education dwindled substantially during the Great Recession and only has only begun to recover within the last two budget cycles, though this recovery has not brought funding to anywhere near pre-recession levels.

SHEEO documents that in 2010, 2011, and 2012, per-student state and local support for higher education reached their lowest levels in the last 25 years. In 2014, per-student state and local funding for higher education increased, but it remains significantly below pre-recession funding levels (State Higher Education Executive Officers Association 2014:8. Note that SHEEO reports its findings in constant inflation-adjusted dollars). Between 2009 and 2014, only three states—Rhode Island was not one of them—increased their appropriations to higher education. Besides state and local funding, public higher education institutions rely on tuition dollars as a primary revenue source, and “tuition revenue typically grow faster when state and local revenues fail to keep pace with enrollment growth and inflation” (State Higher Education Executive Officers Association 2014:9). While overall enrollment in public higher education has increased over time, it declined in the most recent three years. Given the primary role of tuition dollars in funding public higher education, these declines “significantly affected the per-student revenue available to support higher education” (State Higher Education Executive Officers Association 2014:10).

SHEEO notes that each state has a unique context for higher education funding consisting of a “combination of policy choices and fiscal and environmental conditions” (State Higher Education Executive Officers Association 2014:10). Thus, policymakers must have a robust discussion of state priorities in order to answer the question “how much funding is enough?” (State Higher Education Executive Officers Association 2014:14), focusing on the following questions:

- “What kind of higher education system do we want?”
- “What will it take, given our circumstances, to establish and sustain such a system?”
- “Are we making effective use of our current investments?”
- “Where would an incremental or reallocated dollar lead to improved outcomes and help to meet state and national goals?”

SHEEO data show the sharpest increases in reliance on tuition revenue during economic downturns, but after each downturn the level of reliance does not return to prior levels, as shown in the table below.

	<b>Rhode Island</b>	<b>United States</b>
<b>Change in FTE<sup>2</sup> enrollment, 2009-2014</b>	+1.7%	+3.9%
<b>Change in FTE enrollment, 2008-2014</b>	+3.9%	+8.6%
<b>Change in higher education</b>	-9.3%	-13.9%

<sup>2</sup> FTE= Full-Time Equivalent

<b>appropriations, 2009-2014</b>		
<b>Change in higher education appropriations, 2008-2014</b>	-24%	-18.9%
<b>Change in net tuition revenue per FTE, 2009-2014</b>		
<b>Change in net tuition revenue per FTE, 2009-2014</b>	+16.7%	+26.7%

(State Higher Education Executive Officers Association 2014:30-32, 34, 46). Change in net tuition revenue per FTE 2008-2014 is not available.

In FY 2013, Rhode Island ranked 46th in the nation in state financial support of higher education per \$1,000 of personal income (State Higher Education Executive Officers Association 2014:46).

The National Association of State Budget Officers (NASBO) shows that state budgets have stabilized and continued to grow modestly in FY 16 after the Great Recession. Fiscal conditions have improved, but progress is slow and uneven. Infrastructure demands, health care and pension costs loom as challenges. While there is spending and revenue growth, it is far below historic levels; some states are better off than others (National Association of State Budget Officers 2015). In FY 15, Rhode Island was one of 13 states enacting mid-year cuts in higher education spending (National Association of State Budget Officers 2015:10).

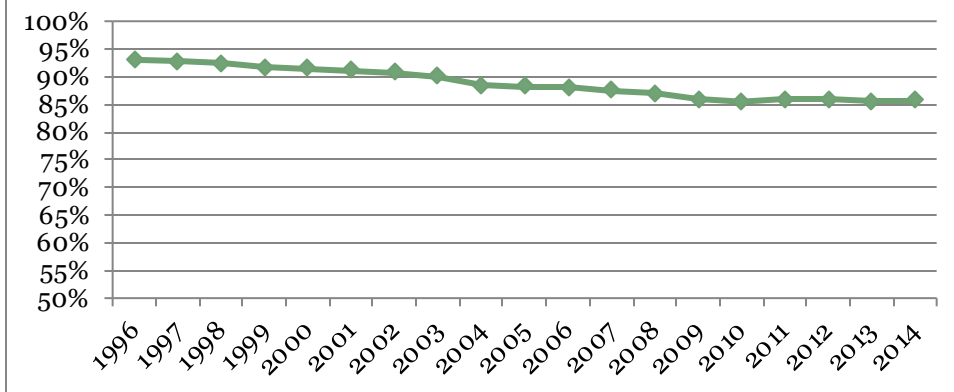
## Methodology

The analysis presented here is based on an exploration of data on Rhode Island College graduates. This data was obtained from three sources:

- 1) A purpose-built original dataset of 628 Rhode Island College alumni who earned undergraduate degrees between the 1930s and the early 2000s who subsequently received alumni awards from the College. This dataset traces the post-baccalaureate career, educational, and leadership accomplishments of these alumni up to the present date;
- 2) Results from a 2014 survey of Rhode Island College graduates, conducted one year after their graduation by the Rhode Island College institutional research office; and
- 3) Data from the [National Student Clearinghouse](#) on Rhode Island College alumni's pursuit of post-baccalaureate education, focusing on the graduating classes of 2004-2005, 2009-2010, and 2014-2015 (pre-, mid-, and post-recession graduating classes).

Our research focuses on Rhode Island College for two primary reasons. First, as this research will show, Rhode Island College educates Rhode Islanders. As the graph below (Rhode Island College Office of Institutional Research and Planning 2006; 2015) shows, while the number of enrolled RIC students claiming RI residency has declined slightly over the past two decades, more than 85% of all RIC undergraduates remain RI residents.

## Percent of RIC Undergraduates with RI Residency at Time of Enrollment



In contrast, only 58% of URI students in the 2014-2015 academic year were Rhode Island residents. At Rhode Island’s private colleges and universities, even fewer students come from Rhode Island, as shown in the table below. It is vital for states facing so-called out-migration problems to determine if these out-migrations are propelled by job market limitations or by large college enrollments, especially of students who attended high school out of state. Where the latter is responsible for graduates’ migration, this is not a problem for states (Gottlieb 2011).

### PERCENT OF STUDENTS FROM RHODE ISLAND

	<b>% of Undergraduates*</b>	<b>% First-Time Degree Seeking Undergraduates**</b>
<b>CCRI</b>	96%	96%
<b>RIC</b>	86%	82%
<b>NEIT</b>	Not Available	45%
<b>URI</b>	58%	44%
<b>Salve</b>	32%	15%
<b>JWU</b>	13%	13%
<b>Bryant</b>	Not Available	12%
<b>RWU</b>	12.3%	8%
<b>PC</b>	13%	8%
<b>Brown</b>	5%	4%
<b>RISD</b>	3.7%	4%

\*Data from institutional research websites maintained by individual colleges and universities or from direct contact with institutional research offices

\*\*Data from the Integrated Post-Secondary Education Data System of the U.S. Department of Education (National Center for Education Statistics 2015b)

Second, Rhode Island College is our state’s comprehensive college, and comprehensive colleges are a vital site for research on postsecondary education. Comprehensive colleges make up approximately 27% of the roughly 2,300 colleges and universities offering degrees at the baccalaureate level and beyond. Of these, nearly half are public (Carnegie Foundation for the Advancement of Teaching



2001). The public comprehensive college sector enrolls a disproportionate share of Pell grant recipients, first-generation college students, and other students from disadvantaged backgrounds due to its greater affordability and accessibility. Insufficient institutional research capacity at the individual campus level and insufficient state-level data collection and analysis affect the ability to track, assess, and respond to issues related to degree completion and outcomes at the comprehensive college, a limitation this research can address. Such approaches have begun to be utilized in some states (see, for example Schneider and Vivari n.d. on Tennessee, and similar reports on Arkansas, Colorado, Florida, Texas, and Virginia), and are widely considered necessary for developing a complete picture of the economic outcomes of higher education, especially as relates to local labor market needs (Carnevale 2012; The Aspen Institute 2015), but have not yet been utilized in Rhode Island.

## Research Findings

### *Location Decisions*

Location information was unavailable for 12.4% of those in our alumni award dataset. Of the remainder, 46.4% stayed in RI permanently after graduation. 28.2% left RI and never held further jobs or attended further education in RI. 15.1% left RI for a time but returned. The remainder have stories which are more complicated or harder to discern. In some cases, these individuals may have careers in nearby MA or CT but still be living in RI (we do not have residential locations, only the locations of employers and education institutions attended). In comparison, the survey of 2013 graduates one year after graduating found that 70% of those who were employed worked in Rhode Island, though again this data does not reflect residential location. So, for instance, graduates living in Rhode Island but working in Boston would not be counted as Rhode Islanders in either the 2013 graduates survey or our data. Combining these two sets of data suggests that alumni who leave Rhode Island do not do so immediately, but rather at a later stage in their career as they pursue more advanced employment and/or educational opportunities.

As our data show, more than two-third of students graduating from Rhode Island College are still in Rhode Island a year after graduation, and the majority either stay in Rhode Island for their entire careers or leave for a time and return. In contrast, the vast majority of students at Rhode Island’s private colleges and universities—nearly all of whom are from out-of-state—choose to leave after graduation.

### *Post-Graduate Educational Attainment*

59.4% of individuals in our dataset of award winners ultimately earned some kind of advanced degree. Among those for whom the year in which the first advanced degree was awarded is available, it took alumni between 0 and 38 years to earn it, with a mean of 7.11 and a median of 5. A full quarter of alumni in the dataset who earned an advanced degree and for whom time to degree is available took 9 or more years to earn it. A total of 471 degrees were earned by individuals in the dataset—93 individuals earned two advanced degrees and 6 individuals earned three or more advanced degrees (the vast majority of these hold positions in K-12 educational administration or as higher education faculty).. These degrees are summarized in the table below:

<b>Degree Type</b>	<b>Number Earned</b>
<b>PhD</b>	23
<b>Law degree</b>	22

<b>Medical, Dental, or Veterinary</b>	9
<b>Master of Business Administration</b>	23
<b>Master of Public Administration</b>	16
<b>Master of Fine Arts</b>	25
<b>Master of Social Work</b>	22
<b>Master's Degree, not otherwise specified</b>	319
<b>Second Bachelors</b>	3
<b>Certificate</b>	6
<b>Other</b>	3

Data from the National Student Clearinghouse allows us to further investigate graduate degree attainment. This data shows that by 10 years post-graduation, the majority of RIC graduates have enrolled in an additional post-secondary degree program of some kind. The largest single destination for these students is graduate work at RIC, though a surprising number enroll in coursework at CCRI after their RIC graduation. RIC graduates who go on to earn graduate degrees do so in a large variety of fields. To provide just a sampling: social work, educational administration, performing arts, pharmacy, business administration, law, public administration, theology, public health, optometry, environmental science, nursing, homeland security...the list goes on.

	<b>2014-2015</b>	<b>2009-2010</b>	<b>2004-2005</b>
<b>Total # graduates</b>	1368	1213	1124
<b>Enrolled in further education</b>	170	469	615
<b>Percent enrolled in further education</b>	12.4%	38.7%	55%
<b>Enrolled outside of RI</b>	26.6%	38.3%	34.2%
<b>Enrolled outside of RI, MA, CT</b>	14.7%	17.8%	15.6%

### *Career Outcomes*

In our dataset of award winners, 67.2% have jobs at the time of the award or more recently that we judged as closely related to their RIC degree. 13.2% have jobs clearly unrelated to their RIC degree. For the remainder, it was impossible to determine, given either lack of knowledge about the specific job/career or lack of data. These findings are consistent with those from the alumni survey conducted by RIC institutional research which found that at one year post-graduation, 60% of graduates held positions related to their undergraduate major. This compares favorably to national data—a national survey of the class of 2014 found that only 62% were employed in any capacity, regardless of the relevance of their degree (National Association of Colleges and Employers 2015c). The variety of careers, employers, and volunteer positions RIC graduates obtain is far too lengthy and diverse to summarize here (see, for a sampling, the case studies).

### *Multivariate Analysis*

Alumni who earned advanced degrees were considerably more likely to leave Rhode Island. While two thirds of alumni who never earned an advanced degree stayed in RI for their entire documented education and career, only 36.7% of those with graduate degrees did so. 31.4% of those with graduate degrees left permanently and 20% left and came back (compared to 21.5% and 4.5%, respectively, of those without graduate degrees). There is no significant relationship between graduation year and the likelihood of having left Rhode Island.

Those who earned graduate degrees are also more likely to have jobs or careers related to their RIC degree. 75% of those with graduate degrees have jobs or careers related to their RIC degree, compared with 55.7% of those who did not earn graduate degrees. Recent graduates are more likely to have jobs that are related to the field of their RIC degree. In an analysis looking at five-year spans of graduation years, findings show that all time spans from 1990 on have more than three quarters of graduates working in positions related to their RIC degree, while in the earlier periods two thirds or fewer of graduates are doing so (these findings are statistically significant at the  $p < 0.001$  level). This finding suggests the importance of preparing students to be life-long learners to support the flexible and changing career paths today's workers hold.

## Discussion

### *Business Location Decisions*

Current economic research, including the “Rhode Island Innovates” report (Battelle Technology Partnership Practice 2016), focuses on the role of economic clusters in driving economic growth. In today's economy, we cannot attract individual business entities, but instead must attract and nurture a web of industries that together represent robust economic sectors—for example, knowledge-based manufacturing and service. Companies choosing locations in which to expand and develop look for this interconnected web. For example, consider GE CEO Jeff Immelt's comments in the *Providence Journal* (Kostrezewa 2016):

*“We want to be at the center of an ecosystem that shares our (GE's) our aspirations.” Greater Boston is home to 55 Colleges and Universities... Massachusetts spends more on R&D than any other region in the world, and Boston attracts a diverse, technologically fluent workforce.*

Yet the particular factors driving business location decisions vary by industry type (Karakaya and Canel 1998). General manufacturing industries are largely concerned with minimizing costs, such as land and construction, while also minimizing risks. Thus, general manufacturing industries' cost analysis takes into consideration business climate and competition, desired levels of productivity including worker training, government policy such as taxes and worker's compensation, unionization, transportation systems, land availability and cost of construction, and commuting distances (Karakaya and Canel 1998). Many policy decisions related to business location remain wedded to the factors that were important to manufacturing industries, but the needs of contemporary advanced industries are different. In particular, tax incentives have become less important (Cohen 2000). While taxes remain a “tie-breaking” factor corporations use to rule out new locations particularly out of line with competitor regions, advanced industries focus more attention on other concerns, and taxes are more likely to be used as an excuse for a move than to be the real driving factor in leaving a particular location (Cohen 2000).

In contrast, high-technology industries are particularly concerned with the availability of a high-quality, skilled, and productive technical and professional workforce (Kimelberg and Nicoll 2012). High-technology industries also focus on ambiance and lifestyle factors, such as the desire to live in areas with urbanized economies, especially for knowledge-based firms in economic sectors other than manufacturing (Kimelberg and Nicoll 2012). However, individual firms' economic strategy factors (Galbraith, Rodriguez, and DeNoble 2008) and management cultures (Doeringer, Evans-Klock, and Terkla 2005) have become increasingly intertwined with location decisions, and location decisions can sometimes provide firms with “the most sought after type of competitive advantage—a long-term sustainable one that rivals cannot easily imitate” (Bird 2011:65), especially where legal and

regulatory environments have unique characteristics. Yet some traditional concerns remain: access to a transportation infrastructure that includes major highways, seaports and airports; governmental factors such as taxes and regulatory environment, utility and construction costs, and population density (Karakaya and Canel 1998; Lambert, McNamara, and Beeler 2007). Academic entrepreneurs also make location decisions, and location-specific factors such “as proximity to certain knowledge assets and to the funding venture capital firms” (Kolympiris, Kalaitzandonakes, and Miller 2015:227) affect their location decisions.

### *Knowledge-Based Industries*

Globalization has had an important impact on the business location decisions of knowledge-based industries by diminishing the importance of the scale of industry in a particular locale (Porter 2000). Instead, knowledge-based industries are more dependent on the creation of clusters with a critical mass of companies in a particular field in a particular location that take varying forms and include downstream activities (Porter and Porter 1998). These clusters are a “geographically proximate group of interconnected companies and associated institutions in a particular field...and possess a socioeconomic business culture linking certain fundamental conditions that are the drivers of economic growth within nations” (Roelandt & den Hertog 1998, as cited in Huggins 2008). Simply put, attracting an industry requires the assembling of a number of businesses that support each other. Huggins offers the example of how Silicon Valley developed its reputation of having a culture friendly to a cluster of companies within the technology industry.

Citing the research of other scholars (such as Audretsch 1998 and Romer 1990), Huggins goes on to make a persuasive case that knowledge workers are the “core agents of the knowledge economy”; that these knowledge workers “possess the ability to transfer and exchange knowledge producing new ideas and placing innovation at the heart of competitive advantage attainment.” He writes that “knowledge clusters become the key drivers of the prosperity of nations. These clusters are focused on the intellectual and knowledge capital residing within and exchanged among individuals, firms, and other knowledge-creating institutions such as universities” (Huggins 2008:277-78).

Productivity then grows where such clusters are located. In addition, knowledge-based industries value access to knowledge and human capital (Audretsch, Lehmann, and Warning 2004), factors which play a significant role in the entry of new knowledge-based firms (Baptista and Mendonça 2010). Research suggests that social network and relational factors may be more important than traditional geographic factors in producing industry innovation (Whittington, Owen-Smith, and Powell 2009). Because of the constant innovation in products and services, location decisions need to be quick and result in zoned, built, high-quality infrastructure up and running within 6 to 9 months of companies’ decision to choose a location (Cohen 2000).

Knowledge-based advanced manufacturing firms are more likely to be created where there are high aggregate numbers of students and graduates with specialized degrees (Baptista and Mendonça 2010). The local development of such firms requires more investment in specialized human capital and R&D activities that generate spillovers. Knowledge-based manufacturing is also more likely to continue to place importance on location factors important in traditional manufacturing, such as land and infrastructure (Kimelberg and Nicoll 2012). For knowledge-based advanced services firms, the number of higher education institutions, students, and college graduates in a region (Audretsch, Lehmann, and Warning 2004)—measures of access to knowledge—play an even more important role, though technology-specific education may be less important.

What both sectors have in common is the high priority on high-quality educational programs, as a good business location is clearly one which has a critical mass of employable persons or which is attractive to the kinds of employees, as workforce suitability is the top criterion for location selection (Kimelberg and Nicoll 2012; O'Mara 1999). Education is also a driver of entrepreneurship: regions with high average educational attainment have higher entrepreneurship rates and higher productivity levels, and entrepreneurs seeking to relocate tend to relocate to cities with more educated workforces (Doms, Lewis, and Robb 2010). **“Location, location, location” has become “education, education, education.”**

Research shows that on a community level, higher overall average educational attainment raises wages for the labor market as a whole (Moretti 2004). The general productivity and wage growth return to a state as a result of the public’s investment in higher education is likely to be at least equal to the individual private return in the form of wages (Lange and Topel 2006).

### *Location Decisions of College Graduates*

Each additional year of higher education is associated with a relatively large increase in the likelihood of residing outside of one’s birth state later in life (Ihrke and Faber 2012; Malamud and Wozniak 2012). Thus, geographic mobility can be understood as an expected outcome of higher education. Those who have completed college show a greater willingness to move long-distance as well as being more responsive to labor markets elsewhere (Wozniak 2010). The rate of long-distance moves for college graduates is twice as high as for those with less college (Malamud and Wozniak 2012).

On average, only about two thirds of individuals attending college in a particular state stay in that state after graduation (Lange and Topel 2006). However, Rhode Island has the third highest proportion of college students enrolled in colleges and universities in the state who are not originally from Rhode Island: 56.2% in 2012 (National Center for Education Statistics 2015a: Table 309.10). This greater proportion of college students who are not from our state clearly reduces the proportion who are likely to stay after graduation, yet as the results above show, the majority of Rhode Island College graduates choose to remain in state as they build their careers.

Migration and location are life-cycle decisions in which individual weigh the expected gains of migration against the cost of migrating, but they are also linked to business cycles and to labor markets. Regions that have higher returns to skills attract more skilled workers (Moretti 2004). Those who have completed college show a greater likelihood of moving away from states with difficult employment markets or low pay for college-educated workers (Kodrzycki 2001). Workers thus relocate to maximize wages (Wozniak 2010), as well as when facing unemployment or for lifestyle reasons. Housing costs, recreational opportunities, and crime rates also shape migration decisions (Hernández-Murillo, Ott, Owyang, and Whalen 2011). When workers undertake such moves, the majority of destination locations are in states with attractive characteristics (Kodrzycki 2001), such as strong economies and labor markets and better amenities, pay, and housing costs, though in many cases destination locations are preferable on only some of these dimensions. However, migration decisions prioritize different factors during different life stages. Young workers prioritize urban density, reasonable living cost, and cultural life; parents value lower-density settings, recreational opportunities, and low crime rates; and older cohorts care most about cost of living and climate (Whisler, Waldorf, Mulligan, and Plane 2008). Those who have relocated in the past are more likely to relocate again (Kodrzycki 2001).

Despite the fact that the pursuit of post-high-school education is correlated with increased geographical mobility, most young college graduates remain in the state in which they completed college (Perry 2001). Students who attend high school in New England but complete college elsewhere are particularly unlikely to return (Kodrzycki 2001), and students who attend college out-of-state are more likely to leave the state where they attended college than are those who attend college in the state in which they completed high school (Groen 2004). Migration rates and average migration distances are higher for students who attend private colleges and universities than they are among those who attend public colleges and universities (Heuer 2004), and degree production at public colleges has larger effects on state-level employment and educational attainment statistics than does degree production at private colleges (Trostel 2010).

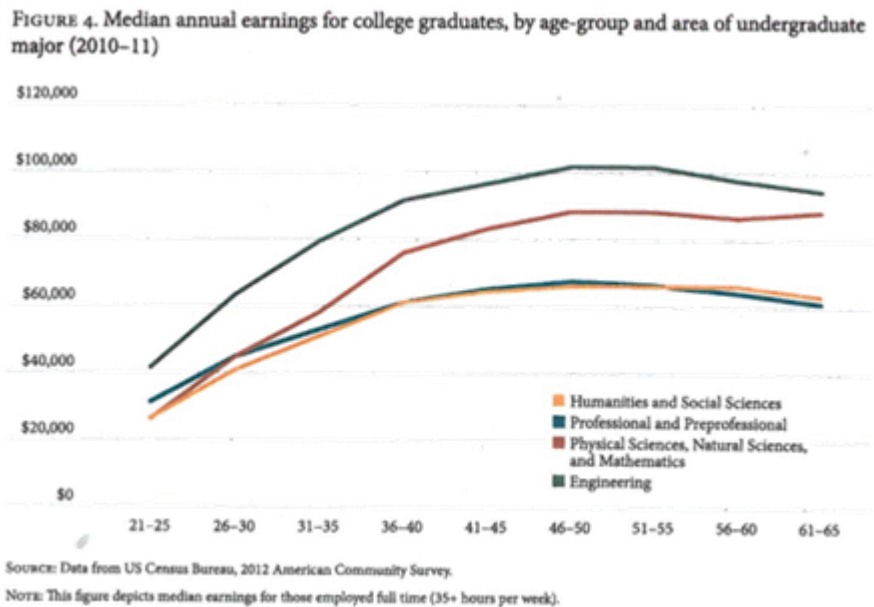
This research enables the development of a profile of the type of student most likely to leave: s/he is a highly motivated, high achieving student who is pursuing or intends to pursue graduate studies in a field with opportunities in multiple locations which offer compensation and lifestyle opportunities and affordable living costs. Some research suggests that those working in knowledge-based services, including the communication and entertainment industries, as well as the military are more likely to be mobile, while those working in utilities, finance, government, and related fields are less likely to be mobile (Moutray 2009). Additionally, those who move are likely to be those who are aware of economic opportunities in their destination location, knowledge often gained by viewing online job ads. However, Rhode Island has a significant weakness in this area, with the second-lowest online labor market favorability when adjusted for local rates of employment of college graduates, after only West Virginia (Carnevale, Jayasundera, Repnikov, and Gulish 2015). Note that this does not mean jobs are unavailable, simply that they are less likely to be posted online.

### *The College-to-Career Pipeline*

Despite hand-wringing by commentators and the parents of recent graduates bemoaning the fact that commencement has come and gone without a remunerative job offer, research clearly shows that college graduates experience substantial economic benefits from their degree attainment (Baum, Ma, and Payea 2013; Carnevale, Smith, and Strohl 2012; Hout 2012). College graduates are more likely to be employed, hold more prestigious occupations, and earn considerably more at both the individual and family level, and these advantages more than offset the extensive and growing cost of college attendance (Hout 2012). Most of these beneficial outcomes are attained by college graduates regardless of their major. However, graduates are more likely to secure a full-time job, to keep that job, to gain admission to a beneficial graduate program, and to move out of the house if they learned more during their time in college (Arum and Roksa 2014).

35% of jobs require job-holders to have earned a bachelor's degree or higher, and for other many positions advanced educational attainment is beneficial (Carnevale, Cheah, and Hanson 2015). Projections suggest that labor market demand for postsecondary credentials will continue to increase in the near future (Carnevale, Smith, and Strohl 2012), especially due to increasing the organizational complexity and technical demands in 21st century careers. On a national level, we are under-producing workers educated and credentialed for such positions even as bachelor's degree attainment continues to grow (Carnevale, Smith, and Strohl 2012).

There are some differences that do occur in terms of college major. Those who major in liberal arts disciplines are more likely to pursue an advanced degree, while those who major in professional fields are more likely to move directly to a full-time job (National Association of Colleges and Employers 2015b). It is indeed true that there are more job openings for welders than for philosophers—but philosophy majors are intellectually skilled and flexible enough to seek a wide variety of careers. This means that even though the job market for philosophers may be tight, and despite political talking points to the contrary, philosophy majors earn higher pay than do welders—about \$5,000 more a year in entry-level jobs. This gap only grows across the life course, with the average philosophy major earning \$85,000 a year by mid-career while the 90th percentile welder tops out at \$58,590 (Youngman 2015). By the peak earning years between 56-60 years old the highest earning graduates were those with degrees in Physical Sciences, Natural Science and Math, followed by Humanities and Social Science, and then by professional and pre-professional degrees. Engineering graduates are in a category all their own; they earn considerably more than other degree-holders at all career stages and 83% of those students are male, an obvious gender gap issue. See the graph (Humphreys and Kelly 2014:8) for more detail.



In the immediate post-graduation period, only about 40% of employed college graduates work in positions closely related to their college major (Board of Governors of the Federal Reserve System 2014). Individuals who pursue a career unrelated to their college major may, on average, earn lower wages right after graduation, but they also experience greater wage growth, such that wage differences become insignificant within a few years (Malamud 2010). Over the long term the likelihood that individuals’ undergraduate degrees will be closely related to their employment outcomes decreases because individuals change positions, often within five years (Bureau of Labor Statistics 2014), and take on new responsibilities that move them away from their original interests. These findings highlight the importance of considering both short-term and long-term time horizons in accessing career and economic returns to higher education (Humphreys and Kelly 2014), as we do above.

Attaining post-baccalaureate education has grown in importance. About a third of college graduates enroll in an advanced degree program within four years of finishing their bachelor’s degree (Choy 2002), and our data shows that Rhode Island College graduates are even more likely to pursue advanced degrees. Incomes of people holding graduate degrees have increased much more than other people’s incomes. Rhode Island has a particularly high concentration of jobs requiring graduate degree attainment, with projections suggesting 11% or more of jobs in the state will require

a master's degree or more within the next few years (Carnevale, Smith, and Strohl 2010). Bachelor's degree holders pay on average \$5,000 more a year in total taxes than do high school graduates (and are considerably less likely to draw on public assistance programs of any kind), while professional and doctoral degree holders pay more than \$20,000 a year in additional taxes when compared to high school graduates (Baum, Ma, and Payea 2013).

Employers make clear that while college major remains influential in the hiring process, leadership experience and extracurricular involvement are nearly as important. As they review candidate's credentials, employers are most likely to seek evidence of leadership capacity, teamwork, written and oral communication skills, problem-solving skills, work ethic, and initiative (National Association of Colleges and Employers 2015a). 29% of employers believe that broader skills are more important for recent college graduates than is field-specific knowledge (Hart Research Associates 2013).

In some fields, especially those requiring particular technical skills, college major may play an important signaling role. However, employer demand for these specific majors can change rapidly. Higher education can be very responsive to changes in such labor market demand, though not in all occupations all the time (Bardhan, Hicks, and Jaffee 2010). Increased degree completions in areas of high labor market demand can be expected to occur four to seven years after the demand spikes or wages increase, a reasonable lag given expected time to degree completion. This lag poses a risk for students in some occupations that their degrees will no longer be in demand by the time they graduate (Cappelli 2015).

Over the past several decades, there has been an overall increase in the average number of years students take to complete their bachelor's degrees (Bound, Lovenheim, and Turner 2010). The increase in time to degree is concentrated at public colleges and universities in part due to declining fiscal resources and increased student employment (Epple, Romano, Sarpça, and Sieg 2013; Turner 2004). Declining state support for public institutions results in increased student-to-faculty ratios, a factor responsible for 21.6% of the increase in average time to bachelor's degree completion, and, in addition, students are unable to enroll in required courses at the appropriate time in their degree program due to insufficient availability of or capacity in such courses (Bound, Lovenheim, and Turner 2010). Half of the increased time to degree observed over the past few decades is due to increased time spent by students in paid employment. Students who work more than 20 hours per week are particularly likely to see increased time to degree. Other important factors affecting time to degree include willingness to incur debt, academic performance, ability to take summer courses, "stopping out" (taking time off) while intending to resume at a later date, and parental status, particularly for women (Adelman 2006; Avery and Turner 2012; DesJardins, Ahlburg, and McCall 2002; Dwyer, Hodson, and Mcloud 2013; Terriquez, Gurantz, and Gomez 2013; Turner 2004).

When state subsidies for public higher education decline, lower-income students are disproportionately affected, thus leading to a significant drop in college enrollment by lower-income students and in increased time to graduation. Low-income students take longer to graduate because they take time off from their degree programs, not because they make less satisfactory academic progress while enrolled (DesJardins, Ahlburg, and McCall 2002). Many students who stop out do not end up returning to the college or university at which they were originally enrolled, but students who transfer also typically have increased time to degree attainment, largely because students almost always lose some credits when they transfer (Bound, Lovenheim, and Turner 2010; Nutting 2004).

Extended time to degree can also lead to an increase in student debt loads. One of the primary concerns of student debt is the burden of re-payment faced by students. While the state ranks 4<sup>th</sup>



among all states in debt carried—8<sup>th</sup> if students with no debt are included (The Institute for College Access & Success 2015), the default rate by Rhode Island college students on those loans is the 8th lowest in the country at 8.4%, and Rhode Island College’s default rate is even lower at 6.4% (Office of Federal Student Aid 2015), indicating the financial ability of Rhode Island College students to manage their debt effectively. It is worth noting that receipt of merit aid does not speed time-to-degree or increase the likelihood that students remain in state after graduation, though receipt of merit aid does appear to reduce post-graduation salaries (Chapman 2015). Incidentally, while robust merit aid programs can influence students’ choice of college, they have little effect on retaining graduates as state residents after college completion (Groen 2011; Sjoquist 2013). Thus, evidence suggests financial aid resources would be more efficiently spent on students who would not otherwise have been able to afford college.

### *Graduation Rates*

By federal statute bachelor’s degree graduation rates are based on tracking the outcomes only of those students who **began at a particular institution as first-time freshman enrolled full-time** in a degree or certificate-seeking undergraduate program and who remained at the same institution to complete a degree within four, six, or—since 2008—eight years of enrolling (Student Right-to-Know and Campus Security Act 1990). The federal parameters for the calculation of graduation rates do not take into consideration many of the types of students who are common in comprehensive colleges like Rhode Island College today. For example, transfer students of any kind, part-time students, and students who have interrupted their education for childbearing or military service are not included in this calculation—and at Rhode Island College, transfer students were 37% of new students in Fall 2014 (Rhode Island College Office of Institutional Research and Planning 2015). Many of these transfer students come from CCRI, taking advantage of lower tuition and the articulation agreements that arise from state policy initiatives. While students who complete an associate’s degree prior to transferring to a four-year college are counted as degree completers at their initial institution, those students who complete some credits at a community college and transfer to a four-year college without earning an associate’s degree prior to transfer count against the community college’s graduation rates and do not count towards the four-year college’s graduation rates (Cook and Pullaro 2010). For example, a study of 320,911 students who started college at a two-year institution and transferred to a four-year college in 2005-2006 found that 64% of the students in this study had transferred prior to receipt of an associate’s degree or certificate from the two-year institution (Shapiro, Dundar, Ziskin, Chiang, Chen, Harrell, and Torres 2013).

It is clear that transfer students do contribute to the educated workforce of their state after graduation, and yet they do not count towards federal measures of graduation rates. The limitations of federal graduation rate statistics point to the importance of considering other measures of educational outcomes such as overall educational attainment rates within a state or outcomes measured on the student rather than entering class level. Within Rhode Island, there is data-gathering capacity to address these issues, but it has many limitations. These limitations are magnified in due to the pending legislative action on performance funding (H 7428), which—like most performance funding measures—incorporates an explicit focus on 4- and 6-year graduation rates as measured by federal standards<sup>3</sup>.

---

<sup>3</sup> The version of H 7428 introduced on January 29, 2016 includes the following language: “The performance-based measures shall include the following metrics: (1) The number and percentage, including growth in relation to enrollment and prior years of bachelor's degrees awarded to first-time,

A considerable volume of research suggests that performance funding policies generally do not have a significant positive impact on graduation rates at public four-year colleges or on overall bachelor's degree attainment rates in states with such policies and could cause the opposite to occur (Dougherty, Jones, Lahr, Natow, Pheatt, and Reddy 2014a; Rutherford and Rabovsky 2014; Tandberg and Hillman 2014), in part because a focus on the traditional federal graduation rate presents public comprehensive colleges with a policy dilemma: they are mission-driven to serve the very populations no one gets credit for serving, such as transfer students and those who have interrupted their educations (Dougherty, Jones, Lahr, Natow, Pheatt, and Reddy 2014b). Many performance funding metrics discourage public colleges from enrolling large numbers of disadvantaged students, resulting in decreased college access and college degree attainment among these populations. When faced with performance funding policies, public colleges may restrict admission by increasing minimum standardized test scores and GPAs for admission, increase their focus on recruiting suburban and out-of-state students, or shift financial aid strategies to focus more on merit aid (Dougherty *et al.* 2014a), despite the limitations of merit aid as discussed above. Where colleges cannot change admissions policies to increase the academic performance of their student bodies, they may instead weaken academic standards or reduce degree requirements to increase retention and graduation rates, at a significant cost to student learning and outcomes.

## Discussion/Implications

As the discussion above has shown, an educated workforce is one of the most important—if not *the* most important—factor in business location decisions among businesses in desirable economic sectors in the knowledge economy, so prioritizing enhanced educational attainment among Rhode Island residents is an important part of an overall economic development strategy. Our findings show that the best way to increase the educational attainment of the labor force in Rhode Island is by providing more robust support to the institutions educating Rhode Island residents—Rhode Island College and the Community College of Rhode Island—and to pay greater attention to the post-baccalaureate educational requirements of the emergent knowledge-based economy.

Our findings also show that the premise of the question “How can Rhode Island minimize ‘out-migration’ by increasing opportunities for students to develop connections with companies in Rhode Island?” is at least somewhat misplaced, particularly in terms of students who attend high school and college in Rhode Island. Across the country, students who stay in the same state for high school and college are likely to remain in that state post-graduation, and this is true in Rhode Island as well. It is particularly true for the thousands of students who have graduated from Rhode Island College. While some do leave the state, many more stay.

There is a paradox in all of this. State policy leaders want to ensure that students graduating from college in Rhode Island are well-trained for future employment and to encourage graduates to stay in Rhode Island to build their careers, but if those employment opportunities are not yet in place, students will find themselves either underemployed or employed doing something that might not match the skill set they worked so hard to acquire during college.

Students who leave Rhode Island to go to college generally do not return, as is the case in other states across the country. Research clearly demonstrates that it is difficult to entice students who have left the state to return, and it is also difficult to entice out-of-state students to remain—merit

---

full-time students within four (4) years and six (6) years including summer graduates.” See <http://webserver.rilin.state.ri.us/billtext16/housetext16/h7428.pdf> for the complete text of the bill.

scholarships that encourage students to attend college in-state do not even do the trick (Groen 2011; Sjoquist 2013). Even if the job outlook is very bright in the state of birth of a college student, “returning home” or “staying put” conflicts with a very basic desire of the out-of-state college student: economic and social mobility. Students, by leaving home, have learned to be mobile and to seek success wherever opportunity presents itself. Furthermore, evidence suggests that it may be just as effective to encourage migration to a state as it is to attempt to retain young people in the first place (Gottlieb 2011). If state policy leaders offer incentives to entice graduates from Rhode Island’s private colleges and universities to stay in Rhode Island, they would actually be encouraging these graduates to directly compete with Rhode Islanders who graduate from Rhode Island College, the University of Rhode Island, and the Community College of Rhode Island, and who in all likelihood would stay in the state in the first place.

In a profound way, Rhode Island has the potential to inhabit the best of both worlds. We have a set of public institutions, particularly Rhode Island College, which educate students who stay in the state in very great numbers after completing their education. But we have also benefited from the many students who leave to pursue degrees elsewhere because they can be ambassadors for the state. Coupled with the positive press Rhode Island is getting as a desirable place to visit and to live, these ambassadors can play an important role in encouraging migration and tourism to our state.

## Next Steps in Research and Policy

A set of specific policy and research recommendations flow from the findings detailed above:

- 1) Find creative ways to celebrate the achievements of higher education in Rhode Island on a regular sustained basis.** This will enable those individuals charged with making business location decisions for their companies to understand that there is a higher education infrastructure in our state which is already producing the kind of graduates that business leaders say they want: graduates who can think, write, communicate, and problem-solve in their industries. It is essential that we showcase our state’s—and our students’—accomplishments.
- 2) Modify efforts to measure the performance of comprehensive colleges like Rhode Island College to include better, more instructive measures.** Rather than limiting performance indicators to reductive measures like graduation rates and salary dollars in the immediate post-graduation period, which suffer from significant measurement errors and omissions, outcome measures should consider what graduates do over the long term and the degree to which they are able to build productive careers and contribute to society here and elsewhere.

Recommendations 1 and 2 require that a sustained commitment to tracking the outcomes for Rhode Island College graduates be developed and the institution be provided with the resources to carry out this commitment. The resulting database should then be available to state agencies charged with attracting industries, a suggestion in line with the recommendations for partnerships between colleges/universities and the Commerce Corporation in the “Rhode Island Innovates” report (Battelle Technology Partnership Practice 2016).

- 3) Build the capacity of Rhode Island’s public institutions to provide graduate education and other forms of post-baccalaureate educational opportunity.** In today’s economy, post-graduate education is necessary for many advanced careers and is much more likely to be targets to specific occupational opportunities. A more robust commitment to graduate education would also provide institutions with the ability to

respond in a timely manner to the direction of the state's economy. It would also enable students seeking such education to obtain it at a reasonable cost within the state, rather than being forced to leave Rhode Island to advance their educational attainment.

## Case Studies

In a separate document, please find case studies of several Rhode Island College alumni who illustrate the themes and patterns discussed above. (NOTE: in the final version of this report, these should appear as sidebars throughout the report at points where the individual alumni story is particularly relevant).

## Works Cited

- Student Right-to-Know and Campus Security Act. 1990. 20 USC1001 Public Law 101-542.
- Adelman, Clifford. 2006. "The Toolbox Revisited: Paths to Degree Completion from High School Through College." U.S. Department of Education, Washington, D.C.
- Arum, Richard and Josipa Roksa. 2014. *Aspiring Adults Adrift: Tentative Transitions of College Graduates*. Chicago: University of Chicago Press.
- Audretsch, David B., Erik E. Lehmann, and Susanne Warning. 2004. "University Spillovers and New Firm Location." Max Plank Institute for Research into Economic Systems, Jena, Germany. 0204.
- Avery, Christopher and Sarah Turner. 2012. "Student Loans: Do College Students Borrow Too Much—Or Not Enough?" *Journal of Economic Perspectives* 26(1):165-92.
- Baptista, Rui and Joana Mendonça. 2010. "Proximity to Knowledge Sources and the Location of Knowledge-Based Start-ups." *Annals of Regional Science* 45(1):5-29.
- Bardhan, Ashok Deo, Daniel Hicks, and Dwight M. Jaffee. 2010. "How Responsive is Higher Education? The Linkages between Higher Education and the Labor Market." University of California Berkeley, Berkeley, CA.
- Battelle Technology Partnership Practice. 2016. "Rhode Island Innovates: A Competitive Strategy for the Ocean State." *Metropolitan Policy Program, Brookings Institution*. accessed 01/25/2016, ([http://www.battelle.org/docs/default-source/tpp/battelle\\_2016tpp\\_rhode\\_island\\_innovates\\_report.pdf](http://www.battelle.org/docs/default-source/tpp/battelle_2016tpp_rhode_island_innovates_report.pdf)).
- Baum, Sandy, Jennifer Ma, and Kathleen Payea. 2013. "Education Pays 2013: The Benefits of Higher Education for Individuals and Society." The College Board, New York, NY.
- Bird, Robert C. 2011. "Law, Strategy, and Competitive Advantage." *Connecticut Law Review* 44(1):61-97.
- Board of Governors of the Federal Reserve System. 2014. "In the Shadow of the Great Recession: Experiences and Perspectives of Young Workers." Federal Reserve Board, Washington, D.C.
- Bound, John, Michael Lovenheim, and Sarah Turner. 2010. "Increasing Time to Baccalaureate Degree in the United States." Population Studies Center, University of Michigan, Ann Arbor, MI. Report 10-698.
- Bureau of Labor Statistics. 2014. "Employee Tenure Summary." *Bureau of Labor Statistics*. Website accessed 12/28/2015, (<http://www.bls.gov/news.release/tenure.nro.htm>).
- Buss, Terry. 2001. "The Effect of State Tax Incentives on Economic Growth and Firm Location Decisions: An Overview of the Literature." *Economic Development Quarterly* 15(1):90-105.
- Cappelli, Peter. 2015. *Will College Pay Off? A Guide to the Most Important Financial Decision You'll Ever Make*. New York: PublicAffairs.
- Carnegie Foundation for the Advancement of Teaching. 2001. "The Carnegie Classification of Institutions of Higher Education: 2000 Edition." Carnegie Publications, Menlo Park, CA. ([http://www.carnegiefoundation.org/dynamic/downloads/file\\_1\\_341.pdf](http://www.carnegiefoundation.org/dynamic/downloads/file_1_341.pdf)).
- Carnevale, Anthony P., Nicole Smith, and Jeff Strohl. 2010. "Help Wanted: Projections of Jobs and Educational Requirements Through 2018." Georgetown University Center on Education and the Workforce, Washington, D.C.
- Carnevale, Anthony P. 2012. "Two Key Actions to Align Postsecondary Education with the Labor Market." Pp. 60-64 in *Governing to Win: Enhancing National Competitiveness Through New Policy and Operating Approaches*, edited by Charles L. Prow. Lanham, MD: Rowman & Littlefield.

- Carnevale, Anthony P., Nicole Smith, and Jeff Strohl. 2012. "Postsecondary Education and Economic Opportunity." Pp. 93-120 in *Preparing Today's Students for Tomorrow's Jobs in Metropolitan America*, edited by Laura W. Perna. Philadelphia, PA: University of Pennsylvania Press.
- Carnevale, Anthony P., Ban Cheah, and Andrew R. Hanson. 2015. "The Economic Value of College Majors." Georgetown University Center on Education and the Workforce, Washington, D.C.
- Carnevale, Anthony P., Tamara Jayasundera, Dmitri Repnikov, and Artem Gulish. 2015. "State Online College Job Market: Ranking the States." Georgetown University Center on Education and the Workforce, McCourt School of Public Policy, Washington, D.C.
- Chapman, Stephanie. 2015. "Student Loans and the Labor Market: Evidence from Merit Aid Programs." Northwestern University Department of Economics, Chicago, IL.
- Choy, Susan P. 2002. "Access & Persistence: Findings from 10 Years of Longitudinal Research on Students." ERIC Clearinghouse on Higher Education, Washington, D.C. ED466105.
- Cohen, Natalie. 2000. "Business Location Decision-Making and the Cities: Bringing Companies Back." Brookings Institution.
- Cook, Bryan and Natalie Pullaro. 2010. "College Graduation Rates: Behind the Numbers." American Council on Education Center for Policy Analysis, Washington, D.C.
- DesJardins, Stephen L., Dennis A. Ahlburg, and Brian P. McCall. 2002. "A Temporal Investigation of Factors Related to Timely Degree Completion." *The Journal of Higher Education* 73(5):555-81.
- Doeringer, Peter, Christine Evans-Klock, and David Terkla. 2005. "Management Cultures and Regional Development: High Performance Management and the Location of New Manufacturing Plants." *European Planning Studies* 13(6):815-30.
- Doms, Mark, Ethan Lewis, and Alicia Robb. 2010. "Local Labor Force Education, New Business Characteristics, and Firm Performance." *Journal of Urban Economics* 67(1):61-77.
- Dougherty, Kevin J., Sosanya M. Jones, Hana Lahr, Rebecca S. Natow, Lara Pheatt, and Vikash Reddy. 2014a. "Implementing Performance Funding in Three States: Instruments, Outcomes, Obstacles, and Unintended Impacts." Community College Research Center, New York, NY. CCRC Working Paper No. 74.
- . 2014b. "Performance Funding for Higher Education: Forms, Origins, Impacts, and Futures." *The Annals of the American Academy of Political and Social Science* 655(1):163-84.
- Dwyer, Rachel E., Randy Hodson, and Laura McCloud. 2013. "Gender, Debt, and Dropping Out of College." *Gender & Society* 27(1):30-55.
- Epple, Dennis N., Richard Romano, Sinana Sarpça, and Holger Sieg. 2013. "The U.S. Market for Higher Education: A General Equilibrium Analysis of State and Private Colleges and Public Funding Policies." National Bureau of Economic Research, Cambridge, MA. Working Paper 19298. (<http://www.nber.org/papers/w19298>).
- Florida, Richard. 2003. *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community, and Everyday Life* New York: Basic Books.
- Galbraith, Craig S., Carlos L. Rodriguez, and Alex F. DeNoble. 2008. "SME Competitive Strategy and Location Behavior: An Exploratory Study of High-Technology Manufacturing." *Journal of Small Business Management* 36(2):183-202.
- Gottlieb, Paul D. 2011. "Supply or Demand, Make or Buy: Two Simple Frameworks for Thinking About a State-Level Brain Drain Policy." *Economic Development Quarterly* 25(4):303-15.
- Groen, Jeffrey A. 2004. "The Effect of College Location on Migration of College-Educated Labor." *Journal of Econometrics* 121(1-2):125-142.
- . 2011. "Building Knowledge Stocks Locally: Consequences of Geographic Mobility for the Effectiveness of State Higher Education Policies." *Economic Development Quarterly* 25(4):316-29.
- Hart Research Associates. 2013. "It Takes More than a Major: Employer Priorities for College Learning and Student Success." The Association of American Colleges and Universities.
- Hernández-Murillo, Rubén, Lesli S. Ott, Michael T. Owyang, and Denise Whalen. 2011. "Patterns of Interstate Migration in the United States from the Survey of Income and Program Participation." *Federal Reserve Bank of St. Louis Review* 93(3):169-85.
- Heuer, Ruth E. 2004. "Migration of Recent College Graduates." Doctoral Thesis, Sociology, North Carolina State University, Raleigh, NC.
- Hout, Michael. 2012. "Social and Economic Returns to College Education in the United States." *Annual Review of Sociology* 38:379-400.
- Huggins, Robert. 2008. "The Evolution of Knowledge Clusters: Progress and Policy." *Economic Development Quarterly* 22(4):277-89.

- Humphreys, Debra and Patrick Kelly. 2014. "How Liberal Arts and Sciences Majors Fare in Employment: A Report on Earnings and Long-Term Career Paths." Association of American Colleges & Universities, Washington, D.C.
- Ihrke, David K. and Carol S. Faber. 2012. "Geographical Mobility: 2005 to 2010." U.S. Census Bureau, Washington, D.C. P20-567.
- Karakaya, Farhi and Cem Canel. 1998. "Underlying Dimensions of Business Location Decisions." *Industrial Management & Data Systems* 98(7):321-29.
- Kimelberg, Shelley McDonough and Lauren A. Nicoll. 2012. "Business Location Decisions in the Medical Device Industry: Evidence From Massachusetts." *Economic Development Quarterly* 26(1):34-49.
- Kodrzycki, Yolanda K. 2001. "Migration of Recent College Graduates: Evidence from the National Longitudinal Survey of Youth." *New England Economic Review* 2001(1):13-34.
- Kolympiris, Christos, Nicholas Kalaitzandonakes, and Douglas Miller. 2015. "Location Choice of Academic Entrepreneurs: Evidence from the U.S. Biotechnology Industry." *Journal of Business Venturing* 30(2):227-54.
- Kostrezewa, John. 2016. "Can R.I. land the next GE?" *Providence Journal*. accessed 01/29/2016, (<http://www.providencejournal.com/article/20160118/NEWS/160119258>).
- Lambert, Dayton M., Kevin T. McNamara, and Megan I. Beeler. 2007. "Location Determinants of Food Manufacturing Investment: Are Non-metropolitan Counties Competitive?" Paper presented at the Annual Meeting of the American Agricultural Economics Association, Portland, OR,
- Lange, Fabian and Robert Topel. 2006. "The Social Value of Education and Human Capital." Pp. 459-509 in *Handbook of the Economics of Education*, vol. 1, *Handbooks in Economics*, edited by Eric Hanushek and Finis Welch. Amsterdam, NL: Elsevier.
- MacDonald, Mary. 2016. "Commerce RI Approves \$4M in Incentives for 3 Providence Projects." *Providence Business News*. Website accessed 02/26/2016, (<http://pbn.com/Commerce-RI-approves-4M-in-incentives-for-three-Providence-projects.112341>).
- Malamud, Ofer. 2010. "Breadth vs. Depth: The Timing of Specialization in Higher Education." *National Bureau of Economic Research*. Working paper 15943 accessed 01/12/2016, ([www.nber.org/papers/w15943](http://www.nber.org/papers/w15943)).
- Malamud, Ofer and Abigail Wozniak. 2012. "The Impact of College on Migration: Evidence from the Vietnam Generation." *The Journal of Human Resources* 47(4):913-50.
- Moretti, Enrico. 2004. "Estimating the Social Return to Higher Education: Evidence from Longitudinal and Repeated Cross-Sectional Data." *Journal of Econometrics* 121:175-212.
- Moutray, Chad. 2009. "Educational Attainment, 'Brain Drain,' and Self-employment: Examining the Interstate Mobility of Baccalaureate Graduates, 1993-2003." Office of Advocacy of the U.S. Small Business Administration.
- National Association of Colleges and Employers. 2015a. "Job Outlook 2016: Attributes Employers Want to See on New College Graduates' Resumes." Website accessed 12/28/2015, (<http://www.nacweb.org/s11182015/employers-look-for-in-new-hires.aspx>).
- . 2015b. "Comparing Outcomes for Liberal Arts and Professional Majors." Website accessed 12/28/2015, (<http://www.nacweb.org/s08192015/liberal-arts-majors-after-graduation.aspx>).
- . 2015c. "First Destinations for the College Class of 2014." National Association of Colleges and Employers, Bethlehem, PA.
- National Association of State Budget Officers. 2015. "The Fiscal Survey of States: An Update of State Fiscal Conditions." *National Association of State Budget Officers*. Report accessed 02/08/2016, (<https://www.nasbo.org/sites/default/files/NASBO%20Spring%202015%20Fiscal%20Survey%20of%20States%20-%20S.pdf>).
- National Center for Education Statistics. 2015a. "Digest of Education Statistics: 2013." *Institute of Education Sciences, United States Department of Education*. website accessed 12/29/2015, (<http://nces.ed.gov/programs/digest/d13/>).
- . 2015b. "IPEDS Data Center." *U.S. Department of Education*. Website accessed 01/06/2016, (<http://nces.ed.gov/ipeds/datacenter/Default.aspx>).
- Nutting, Andrew W. 2004. "Time-of-Transfer and the Outcomes of Attending a Four-Year College: Evidence from SUNY." Cornell Higher Institution Research Institute, Cornell University, Ithaca, NY. 54.
- O'Mara, Martha. 1999. "Strategic Drivers of Location Decisions for Information-Age Companies." *Journal of Real Estate Research* 17(3):365-86.

- Office of Federal Student Aid. 2015. "Three-year Official Cohort Default Rates for Schools." *U.S. Department of Education*. Website accessed 12/28/2015, (<http://www2.ed.gov/offices/OSFAP/defaultmanagement/cdr.html>).
- Perry, Kristin Keough. 2001. "Where College Students Live after They Graduate." *Institute of Education Sciences, U.S. Department of Education*. accessed 02/01/2016, (<http://eric.ed.gov/?id=ED453739>).
- Porter, Michael E. and Michael P. Porter. 1998. "The Adam Smith Address: Location, Clusters, and the New Microeconomics of Competition." *Business Economics* 33(1):7-13.
- Porter, Michael E. 2000. "Location, Competition, and Economic Development: Local Clusters in a Global Economy." *Economic Development Quarterly* 14(1):15-34.
- Rhode Island College Office of Institutional Research and Planning. 2006. "Fact Book 2005-2006." Rhode Island College, Providence, RI. (<http://www.ric.edu/oirp/pdfreports/FactBook2005-06.pdf>).
- . 2015. "Fact Book 2014-2015." Rhode Island College, Providence, RI. (<http://www.ric.edu/oirp/pdfreports/FactBook2014-15.pdf>).
- Rhode Island Public Expenditure Council. 2015. "Analysis of the Economic Development Initiatives Included in the Governor's FY 2016 Budget Proposal." Website accessed 02/08/2016, (<http://www.ripec.org/pdfs/2015-article-29.pdf>).
- Rhode Island Statewide Planning Program. 2014. "Rhode Island Rising: A Plan for People, Places, and Prosperity." *Rhode Island State Guide Plan - Report #118, Economic Development Element*. accessed 02/08/2016, (<http://www.planning.ri.gov/documents/Econdev/2015/RhodeIslandRisingFinalwReport118.pdf>).
- Rutherford, Amanda and Thomas Rabovsky. 2014. "Evaluating Impacts of Performance Funding Policies on Student Outcomes in Higher Education." *The Annals of the American Academy of Political and Social Science* 655(1):185-208.
- Schneider, Mark and Ben Vivari. n.d. "The Earning Power of Graduates from Tennessee's Colleges and Universities: How are Graduates from Different Degree Programs Doing in the Labor Market?" College Measures, Rockville, MD.
- Shapiro, Doug, Afet Dundar, Mary Ziskin, Yi-Chen Chiang, Jin Chen, Autumn Harrell, and Vasti Torres. 2013. "Baccalaureate Attainment: A National View of the Postsecondary Outcomes of Students Who Transfer from Two-Year to Four-Year Institutions." National Student Clearinghouse Research Center and Project on Academic Success, Indiana University, Herndon, VA.
- Sjoquist, David L. 2013. "The Effects of HOPE on Post-College Retention in the Georgia Workforce." *Regional Science and Urban Economics* 43(3):479-90.
- State Higher Education Executive Officers Association. 2014. "State Higher Education Finance: FY 2014." *State Higher Education Executive Officers Association*. Report accessed 02/06/2016, (<http://www.sheeo.org/sites/default/files/project-files/SHEF%20FY%202014-20150410.pdf>).
- Tandberg, David and Nicholas W. Hillman. 2014. "State Higher Education Performance Funding: Data, Outcomes, and Policy Implications." *Journal of Education Finance* 39(3):222-43.
- Terriquez, Veronica, Oded Gurantz, and Ana Gomez. 2013. "California's College Stopouts: The Significance of Financial Barriers to Continuous School Enrollment." *Pathways to Postsecondary Success* 7 (July):1-7.
- The Aspen Institute. 2015. "From College to Jobs: Making Sense of Labor Market Returns to Higher Education." The Aspen Institute College Excellence Program, Washington, D.C. 15/07.
- The Institute for College Access & Success. 2015. "CollegeInsight." Website accessed 12/28/2015, (<http://college-insight.org/#explore/go&h=ae487dc9c317725535aeb7f563a33914>).
- Trostel, Philip A. 2010. "The Impact of New College Graduates on Intrastate Labor Markets." *Journal of Education Finance* 36(2):186-213.
- Turner, Sarah E. 2004. "Going to College and Finishing College: Explaining Different Educational Outcomes." in *College Choices: The Economics of Where to Go, When to Go, and How to Pay For It*, edited by Caroline Hoxby. Chicago, IL: University of Chicago Press.
- Whisler, Ronald L., Brigitte S. Waldorf, Gordon F. Mulligan, and David A. Plane. 2008. "Quality of Life and the Migration of the College-Educated: A Life-Course Approach." *Growth and Change* 39(1):58-94.

- Whittington, Kjersten Bunker, Jason Owen-Smith, and Walter W. Powell. 2009. "Networks, Propinquity, and Innovation in Knowledge-intensive Industries." *Administrative Science Quarterly* 54(1):90-122.
- Wozniak, Abigail. 2010. "Are College Graduates More Responsive to Distance Labor Market Opportunities?" *The Journal of Human Resources* 45(4):944-70.
- Youngman, Clayton. 2015. "Marco Rubio said Wrongly that Welders Make More Money than Philosophers." *Politifact*. Website accessed 12/28/2015, (<http://www.politifact.com/truth-o-meter/statements/2015/nov/11/marco-rubio/marco-rubio-welders-more-money-philosophers/>).