

Increased Spending from Post-Secondary Graduates in Utah (2011-2018)

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ABSTRACT

Higher educational attainment typically leads to higher wages, which, in turn, leads to higher levels of consumption. Labor demand for individuals with higher education has changed the landscape of the workforce. As of 2016, more than one-third of the United States labor force over the age of 25 holds a bachelor's degree or higher. Income and consumption patterns have also changed and vary among individuals with different educational attainment. The objective of this study aims to understand the differences of income and consumption among individuals of varying educational attainments in Utah from 2011 to 2018. Income is investigated at one and five years after graduation. Consumption figures are grouped by educational attainment, and by the types of goods and services individuals purchase to better understand patterns and differences. Consumption figures from those with post-secondary education are then subtracted from individuals with a high school diploma only to assess how, and where additional spending occurs. Results of the study showed increased average income and consumption

KEYWORDS

Average propensity to consume (APC), discretionary spending, educational attainment, middle-class, living-wage, socio-economic status

1 | INTRODUCTION

1.1 | Background/Intro

Personal consumption is the largest component of gross domestic product (GDP), as it represents nearly 70% of the measure. When measuring changes in an economy's consumption patterns, a common measure is a region's marginal propensity to consume (MPC). MPC is defined as the annual change in consumption patterns in a given year (Romer, 2012). In 2018, Utah had the highest MPC in the nation at 7.3%. Prior years show similar growth within the state, with personal consumption expenditures increasing 5.7% from 2016 to 2017. This marginal increase was the third highest in the nation, behind Idaho and Washington (Utah Department of Workforce Services, 2019). Variables relating to this growth may include changes in consumer behavior, consumer confidence, gross investment, government spending, technology, trade, and education (Romer, 2012). The objective of this study is to measure the additional consumption related to graduation from public technical colleges, community colleges, or universities in Utah from 2011 to 2018.

Labor demand for an educated workforce has led to an increase in awards from all post-secondary programs in Utah. The share of Utah residents with a bachelor's degree or higher has increased from 28.6% to 32.6% over the past decade (Kem C Gardner Policy Institute, 2018). National 10-year employment projections show a heightened demand for an educated workforce, with demand for master's degree holders increasing the most at 13.7% for entry level jobs (U.S. Bureau of Labor Statistics, 2019). With the landscape of educational expectations in the workforce changing, spending patterns also differ among individuals with different educational attainment. Generally speaking, higher educational attainment leads to higher income, and higher income leads to higher levels of consumption.

While the literature on the changing demands and the wages of an educated labor force is extensive, research is limited when it comes to exploring both the MPC, and the categorization by educational attainment of this spending (Lavaughn, 2014). The objective of this study aims to add to the literature in three key ways. First, by examining the distribution of wages for residents of Utah with different educational attainment. Second, by examining the categorization and consumption differences among individuals with different educational attainment. And, third, by investigating the added value from spending that individuals with post-secondary education contribute to

Utah's GDP compared to those with a high school level education or equivalent. With a better understanding of income and consumption patterns, data-informed decisions for students, educators, and policy makers can be made on a variety of issues. Funding, education decisions, and effective taxation laws are just a few examples of issues affected by these objectives.

1.2 | Literature Review

Workforce demand over the past three decades has reflected the need for increasingly higher education. Over the last 25 years, the number of high school graduates, as a percentage of the workforce, has decreased more than 10 percentage points, and they currently represent 26% of the national workforce. This figure is compensated by the recent increase in a higher educated workforce. Since 2012, individuals with either some college or an associate degree have made up the largest share of the workforce. Previously, those with only a high school diploma had made up the largest percentage. The number of individuals with a bachelor's degree has also seen a dramatic increase. In 1997, less than 20% of the labor force had a bachelor's degree only, today that figure is higher than 25% (U.S. Bureau of Labor Statistics, 2017). As of 2016, more than one third of the labor force over the age of 25 holds a bachelor's degree or higher (U.S. Census Bureau, 2017).

Utah's workforce is more educated than the national average. Over 10 years, the share of Utah residents with a bachelor's degree has risen 4 percentage points. Utah is currently ranked 18th nationally in educational attainment with a bachelor's degree or higher (Kem C Gardner Policy Institute, 2018). In addition to university or community college education, post-secondary education is also available through Utah's System of Technical Colleges. Prior to the merger between technical colleges and universities, the Utah System of Technical Colleges sought to increase its annual number of graduates by 75% percent by 2028. The total number of board-approved graduates in 2019 was 5,364 (Utah System of Technical Colleges, 2019).

Higher educational attainment, with few exceptions, leads to higher wages and influences how individuals save, spend, work and consume. Labor market demand for an educated workforce has steered the trend for more individuals obtaining post-secondary education. In turn, this higher labor demand for individuals with post-secondary education leads to higher wage rewarding individuals who have obtained both technical certificates and degrees. Higher income has increased consumption, which benefits the



economy through GDP growth, including sales tax collected. GDP is a measure that accounts for the total goods and services produced in an economy in one-year. In the simple expenditures approach GDP consists of consumer expenditures, gross domestic private investment, government expenditures, and net exports (Miller, 2018).

Compared with the annual national average income, Utah is \$4,049 higher. The average household income in Utah is \$77,940; however, this figure should be contextualized in tandem with Utah's average household size of 3.19, which is the highest in the nation (Kem C. Gardener Policy Institute, 2018).

In capitalist economies, wealth is distributed unevenly. Across different income groups consumption and savings patterns vary. Consumption is a function of disposable income (total income less taxes), savings, the degree of uncertainty contemplated, the rate of interest, and taste factors such as age, family size, and location (Friedman, 1957). As income increases, with all other variables constant, consumption also increases.

As wage increases, the potential to consume also grows. Consumption patterns in Utah are largely the same as the United States. Comparing data from the 2018 consumer spending survey (conducted by the U.S. Bureau of Economic Analysis), the largest variance in an individual category in 2017 was household services, in which residents of Utah spent 2.02% less than the national average. In contrast, Utah spent slightly more than the national average in recreation and gasoline (U.S. Bureau of Economic Analysis, 2019). Additional information on differences can be seen in the adjustment column of Appendix Table 2.

Average national household expenditures (U.S. Bureau of Labor Statistics, 2018) grouped by educational attainment are seen in Table 1 below. As wage increases, household expenditures increase.

Table 1: Average national household annual expenditures per education group (BLS, 2018)

Educational Attainment	Annual household expenditures
High school graduate only	\$38,173
Some college	\$48,164
Associate degree	\$59,252
Bachelor's degree	\$72,264
Master's degree or higher	\$95,446

The highest spending per household comes when the head-of-household holds a master's degree or higher. In contrast, when the highest level of educational attainment is a high school or equivalent, spending decreases to less than half of those with a master's degree or higher. The change in spending is due to the variance in wage. Nationally, as a percentage of income, high school graduates spend at a much higher rate than their counterparts with post-secondary attainment. However, households where an individual has a master's degree or higher spend 2.5 times more than when the head of household has a high school education only (Engaging Data, 2019).

Income is largely affected by inflation, which can decrease purchasing power. Despite a slight increase in wages over the past 2 years, the Consumer Price Index (CPI) has outpaced the national wage gain by 1.3 percentage points since 2017. In other words, the price of goods and services people are purchasing are increasing at a higher rate, on average, than the wages they receive. Recent median real wage loss has increased focus on the variance of the cost-of-living across the United States (Fottrell, 2019). To measure living wage with consideration to CPI, Dr. Amy Glasmier of the Massachusetts Institute of Technology developed the Living Wage Calculator in 2004. The living wage calculator measure provides a clearer picture to a true cost-of-living, as it takes into account geographic price variance in a specific region. Its model accounts for the variance of multiple variables such as childcare, food, insurance, and housing (Glasmier, 2019). A more detailed description on the variables that construct the model can be found in the methodology section of this paper.

In 2018, Utah's cost-of-living for an individual with no dependents was \$24,083. Taking into account Utah's above-average household size of three, that figure rises to \$61,357 in household cost-of-living for 2018. The cost-of-living in Utah for individuals is 3% less than the national average. That figure increases to 5.2% higher than the U.S. mean for individuals living in the Salt Lake City metropolitan area (Glasmier, 2019).

In addition to the cost-of-living variance, another important factor in determining the health of a region is the distribution of the wealth within an economy, or income inequality. A recent set of studies where individuals were asked about income distribution concludes that individuals in the United States and Australia woefully underestimate the degree of economic inequality in their society (Bosancianu, 2017).



Over the past four decades, the polarization of income inequality has displaced many who were in the middle class into lower income brackets (Alichi, 2016).

A measure commonly used to determine the characteristics of inequality is the Gini Index. This measure ranges from zero to one, where a zero rating indicates perfect income equality, and a one rating would represent perfect income inequality. The Gini Index indicates that Utah has the most equitable income distribution in the United States with a coefficient of .423 (United Health Foundation, 2018). The national average income distribution has a coefficient of .482, while New York is the least equitable state with a coefficient of .523. These United States measure differ from Canada and most developed countries in Europe with indices scores between 0.22 and 0.38, which indicates they have higher income equality than the United States. In 2016, the regionally-adjusted lower- and upper-income bounds for Utah's middle-income households were \$39,690 to \$98,270. By this measurement, just under half of Utah's population belonged to the middle class in 2016 (Pace, 2018).

Education also influences how individuals spend and save their earnings; which, in-turn, influences the regional- and macro-economy. Tyndorf and Martin, economists at Aurora University in Illinois, concluded from their research that a 10% increase in university degrees can increase in a regions' GDP measure of 2.2% and 1.0% in the medium and long-term growth measures, respectively. Community college education and its respective degrees provide a significant impact on the U.S. economy in the short and medium term, while universities and their respective degrees provide a significant impact on economic growth in the long term (Tyndorf and Martin, 2018). In addition, the economic benefit of universities is not confined to the region where they are built but "spills over" to neighboring regions, having the strongest effects on those that are geographically closest (Valero, 2019).

Utah's per capita consumption in 2018 was \$37,721 (U.S. Bureau of Economic Analysis, 2019). Personal consumption expenditures have consistently risen at a higher rate in Utah than it has nationally. Prior to 2011, marginal personal consumption was also positive except for 2009, which was likely a result of the 2008 economic recession (Utah Department of Workforce Services, 2019). In 2018, Utah had the highest MPC in the United States at 7.3%. Although marginal increase in per capita personal consumption is high overall, spending is lower than many peer states with Colorado's at \$42,239,

and Nevada's at \$39,806. Average personal consumption expenditures (PCE) nationally was \$40,878 (U.S. Bureau of Economic Analysis, 2019). In connection with consumption, GDP in Utah, as a measure of economic growth, has risen from \$165.7 billion in 2017 to \$177.3 billion in 2018 (Federal Reserve Bank, 2019).

The area of higher spending from households with highly educated individuals shows proportionally higher outlays on luxury goods. Luxury goods include consumption of food away from home (e.g., restaurants), leisure, and additional spending on education.

Age and household size also play important roles in household spending patterns. Consumption follows a life-cycle distribution that begins rising as an individual enters into their 20's and reaches their maxima around age 60. Consumption after age 60 begins to recede until the end of a person's life. The significant variable explaining this trend is the changing household demographics during a person's middle-age years (i.e. family-rearing years). Both non-durable (i.e., goods generally meant to last less than one year) and durable goods show the increase and subsequent decrease of consumption during a person's life-cycle (Fernández, 2007).

Historically education, age, and household size are not the only variables that affect consumption. Many variables can change the slope of both consumption and savings lines, and it is not necessarily linear across different income and education groups (Fisher, 1956). One example is macroeconomic unemployment shocks, which have shown long-term effects on consumption (Malmendier, 2015).

In terms of a person's total income, represented by one, average propensity to consume is less than one, and when added to savings is equal to wealth of an individual (Keynes, 1936). Average propensity to save typically has an inverse relationship with consumption holding wage constant (i.e., what we do not consume we save). As individuals gain more wealth, the ability to save for future shocks or retirement increases. This pattern becomes more evident when observing savings instruments that are not liquid, meaning individuals are financially secure enough to take on liquidity risk (Carroll, 2017).

Studies in regard to increased consumption by educational attainment vary in methodology and purpose. These studies have covered the distribution of wealth, the changing educational expectations in the labor force, income polarization, and how they relate to the changing workforce. This study builds on the previous work by examining income distribution in Utah's workforce. This income is then broken down into consumption groups to explore the consumption patterns as they



relate to educational attainment in Utah.

2 | METHODS

2.1 | Data

Data for this project was collected from a variety of sources. Student records were obtained from two agencies: the Utah System of Technical Colleges and the Utah System of Higher Education; accessed through the Utah Data Research Center. Data from these sources contains demographic information such as sex, race, and age. Information from these records are then matched with records from the Utah Department of Workforce Services' unemployment insurance records, which contain quarterly wages from employers across the state. Wage information for high school graduates only cannot be obtained from the Utah State Board of Education, as they do not have variables available to match with Workforce Services' unemployment insurance records.

To supplement state agency data stored with the Utah Data Research Center, federal agency records were also used. The U.S. Bureau of Labor Statistics annually conducts the American Community Survey (ACS). This survey compliments the work conducted decennially by the U.S. Census Bureau, and is sent to 295,000 households each month. Questions about race, ethnicity, educational attainment, migration, and disability are recorded. Weights are then applied to each respondent group to be representative of the population in their area. ACS uses a standard confidence interval of 90% (U.S. Census Bureau, 2019).

The U.S. Bureau of Labor Statistics also conducts research on consumption through the Consumer Expenditure Survey. This survey does not have the same magnitude of respondents as the American Community Survey. Traditionally, the survey is broken into different regions and weighted to represent that region. In 2017, the U.S. Census Bureau experimented with weighted averages for select states, but to maintain anonymity, only states with sufficient amount of participants were selected. Unfortunately, Utah is not a state that meets the U.S. Bureau of Labor Statistics population threshold for this survey. As such, national data is used and adjusted to average Utah resident wages.

The consumer expenditure survey is used to classify consumption into sub-categories to understand how Americans spend, and to measure changes in consumer spending over time. Sub-categories include durable goods, which have a life expectancy of more than a year, and non-durable goods which are generally used for one time

consumption (U.S. Bureau of Labor Statistics, 2019). Different spending categories of the survey include food, housing, apparel, transportation, healthcare, entertainment, personal care, reading, education, tobacco, insurance, and taxes. Questions from the survey are further classified into sub-categories to better understand consumer spending patterns.

In coordination with the Consumer Price Index, tables provided from the U.S. Bureau of Economic Analysis are used to estimate Utah's per capita expenditures with the U.S. Bureau of Labor Statistics regional estimates and the U.S. Census Bureau's population estimates. The survey is taken quarterly to understand changes in spending over time for a state.

2.2 | Data Limitations

At the time of this study, student records from the Utah System of Technical Colleges, and the Utah System of Higher Education were available from 2011 to 2018. The datasets are used primarily to evaluate the wage growth in each group with different educational attainment. Because the data sets are not comprised of the total life-cycle of a career (approximately 30 to 50 years), results may be positively skewed to younger individuals as compared to sets that are representative of an entire population.

Any public or private certificate or award earned prior to 2011 are not included in the results, as data are not available to the Utah Data Research Center. In addition, any degrees obtained outside of publicly-funded Utah institutions, like Brigham Young University and Westminster College, are not included in the study. Data for private colleges that are online, like Western Governors University, are not currently available for this study. 31% of master's degrees and 12% of bachelor's students are exclusively online (Blagg, 2018). To better understand the population who are in mature stages of their career, wage data from the ACS was used.

Furthermore, wage records are obtained from Utah's Unemployment Insurance program. Employers who are not required to participate in the Unemployment Insurance program are not included in the wage record. This may include those who are self-employed, federal employees, or military personnel. Both wage records and student records do not contain information on dependents who are reliant on the income of the graduate. Black market transactions, such as non-reported cash tips or under-the-table transactions are not captured in wage data. The ACS can be filtered for only residents of Utah, but does not ask where education was obtained. Respondents likely include individuals who obtained education outside of the state of Utah's



higher education network.

In the first research objective, to correct for the possibility of a younger population data from the ACS is used to supplement the data from school records. The ACS is sent to the heads of households and is weighted to represent the state's population. For example, in 2017 the U.S. Census Bureau estimated the average of the workforce in Utah was 36.5 years old. By comparison, the ACS mean age was 34.7 and included a broader range of ages. Wage records from individuals aged 18 (data filtered to remove respondents younger than 18) into mature ages of the workforce are included in this survey (U.S. Census Bureau, 2019).

The Consumer Expenditure Survey is nationwide-only, and micro-datasets are separated into four regions. Utah is unique because its average labor force age is younger than the national average, while it also has a larger household size. Because of the unique cultural differences in Utah, regional and national consumer spending may be a less accurate measure than in other states. To account for this difference, estimates from the U.S. Bureau of Economic Analysis are examined to potentially correct for any differences between Utah spending habits, and spending on the national level. Both surveys measuring expenditures do not examine every possible category of consumption, as all consumption cannot be measured, and are subject to response bias.

The Consumer Expenditure Survey is a measure of expenditures and not consumption. For non-durable goods, the definition is in most cases the same. However, for durable goods an item may be purchased in one calendar year, and have continued consumption through several years. The expenditure will only be accounted for in the calendar year it was initially purchased (Fernández, 2007).

2.3 Objective One

Consumption is a function of income. To fully understand consumption patterns across education groups, a foundation of income and income growth is necessary to provide context to consumption patterns. Objective one explores income and income growth one-year and five-years after graduation. Mathematically, consumption is defined as:

$$K = I - G - S$$

Consumption (K) is the difference of income (I), taxes (G), and savings (S) (Romer, 2012). To provide context to the ultimate objective of

additional spending with increased educational attainment, a measure for wage growth and living wage is presented. Traditionally, living wage, as derived by the federal government, is based from poverty measures developed by Mollie Orshansky, who was a staff economist at the Social Security Administration in the 1960's. Orshansky's measure is derived by calculating the cost of a diet with minimum food for a family of four, then multiply by three to account for family expenses (Census, 2019). The figure is then adjusted into matrices accounting for family sizes up to nine.

Although Orshansky's method can be applied easily, Glasmier's living wage methodology accounts for local price variance, and uses variables similar to the Consumer Expenditure Survey (Glasmier, 2019). These variables include: food, child care, medical, housing, transportation, taxes, and other expenses. In this study, living wage is defined as the cost needed for an individual, with no dependents, to be able to provide the basic necessities of life which include food, housing, healthcare and transportation without the aid of government transfer payments, or outside assistance from friends or family. This is in contrast to Orshansky's definition of a minimum diet needed to subsist. Due to multi-variable price indexing, Glasmier's method will be used as the definition for living wage. The living wage base used in this study was for 2018. Years prior to 2018 were inflation-adjusted using the CPI figures derived from the U.S. Bureau of Labor Statistics. Family size is unknown for each individual; as such, both living wage and middle-class wage are calculated with the assumption of no dependents.

Middle class has been defined several different ways: median wage, poverty guidelines, percentile distribution, and quantile analysis. For this work, the same standard used by the Kem C. Gardner Policy Institute is utilized. They construct "middle class based on household income, compared to median income and federal poverty guidelines" (Pace, 2018). This definition was chosen to follow general principles of conservatism, to be in-line with the 'zero dependent assumption' in the living wage definition, and to account for the large household size which may incentivize laborers to earn more than would be expected in other states (Pace, 2018). The median wage has been calculated for 2016. The years prior to and after 2016 have been inflation-adjusted using the CPI derived from the U.S. Bureau of Labor Statistics. The thresholds for each given year of the study (2012 - 2018) are shown on the following page in Table 2:



Table 2: Wage thresholds (2012 – 2018)

Year	Living Wage	Middle-class Wage
2018	\$24,083.00	\$41,526.00
2017	\$23,509.00	\$40,536.00
2016	\$23,018.00	\$39,690.00
2015	\$22,732.00	\$39,196.00
2014	\$22,705.00	\$39,149.00
2013	\$22,342.00	\$38,524.00
2012	\$22,020.00	\$37,968.00

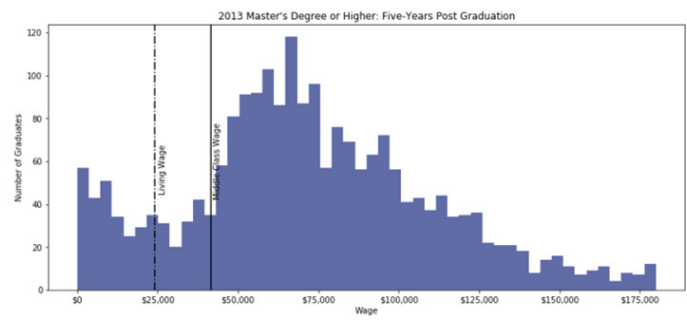
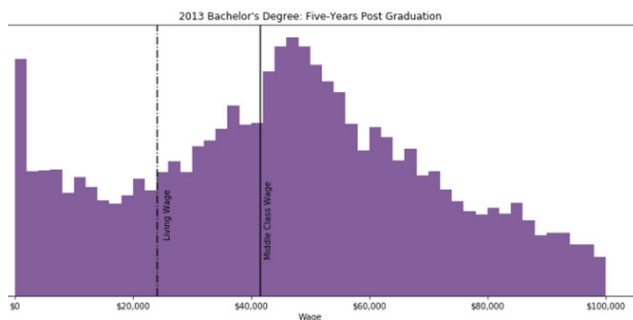
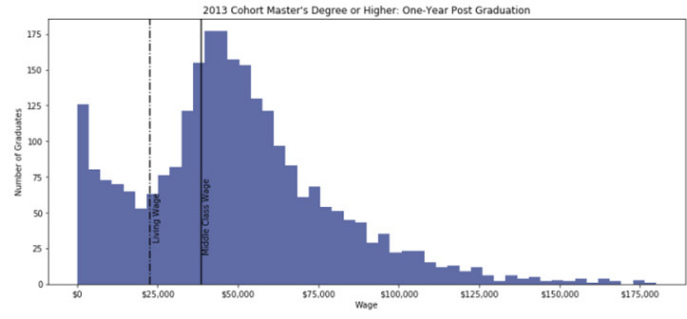
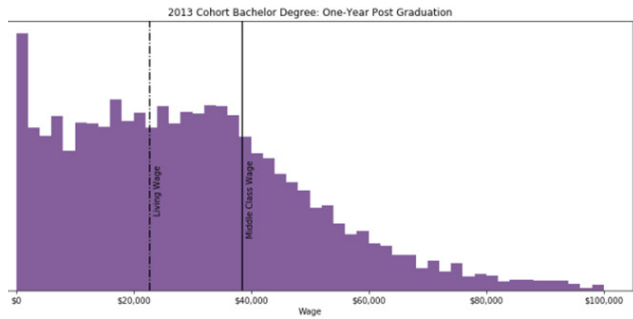
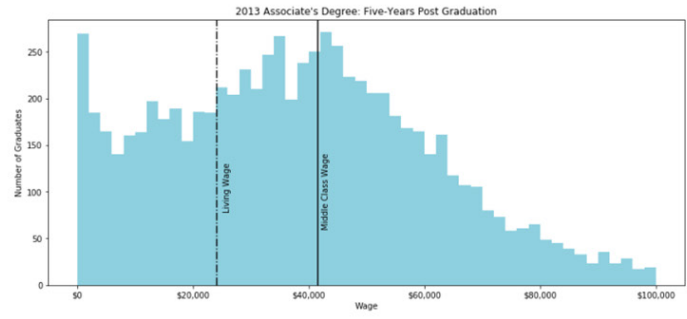
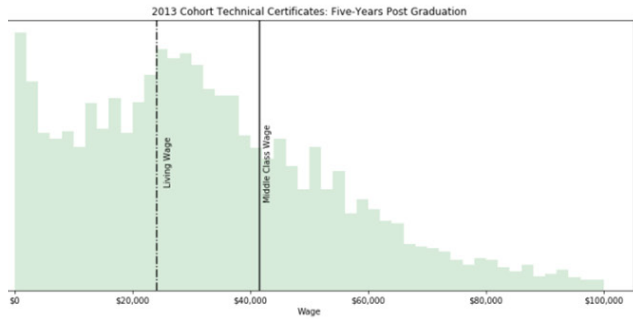
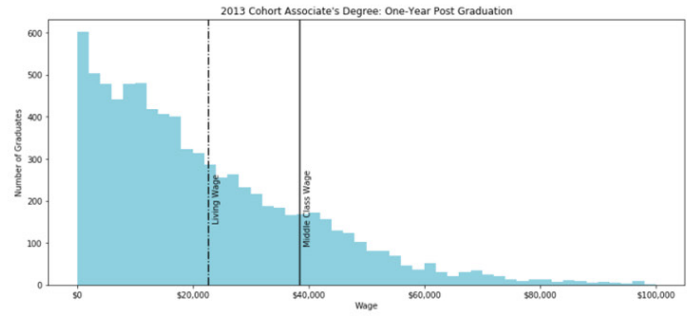
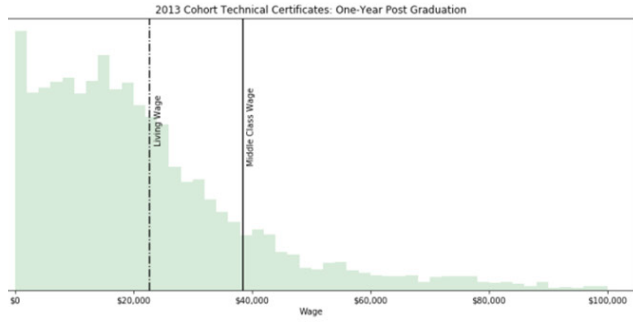
Wage will be evaluated by the following four groups of different educational attainment: technical certificate, associate degree, bachelor's degree, and master's degree or higher. Those in the master's degree or higher group include graduates who have completed a master's degree, a research-based doctoral degree, professional practice PhD, or other doctoral degree designations. Individuals will be filtered to their highest level of educational attainment. These groups are consistent with the Consumer Expenditure Survey conducted by the U.S. Bureau of Labor Statistics, with the addition of the technical certificate. This addition was added to include all educational institutions, including technical and community colleges in the state.

Distribution of wages at one-year, and five calendar years following graduation will be considered by the ratios of graduates meeting a living- and middle-class wage threshold. Ratios, along with a distribution, are used as opposed to simple averages to understand wage equality and the effect of outliers in a distribution, and to create a more meaningful understanding of wage and income growth for each group.

Each education group for the 2013 cohort is color coded to see the progress of wages one year (the top histogram), and five years (the bottom histogram) after graduation. 2013 is used as it is the most recent cohort available at the time of the study where both one-year and five-years wages can be obtained. Individuals are grouped by their highest level of educational achievement in the cohort year. For example, if an individual obtains a technical certificate and a bachelor's degree in the same observed cohort year they will be grouped in the bachelor's degree category. Additional education obtained after the cohort year does not change grouping in subsequent years. Additional cohorts are available in the appendix but are not included here as they are similar to the results from the most recent cohort in the study (see Appendix Figures 1 and 2). Technical certificates are light green, associate degrees are turquoise, bachelor's degrees are violet, and master's degree or higher is represented in blue.



Figure 1: 2013 Cohort Income by Educational Attainment (Histogram).



The highest paying mean wage is five years after graduation with a master's degree or higher. As educational attainment and experience increase, wage also increases. To show the majority of the histogram for those who obtained a master's degree or higher, the X-axis showing wage was increased to \$175,000.

2.4 Objective Two

With the background of income information, objective two looks at how education and income affect consumption patterns across each level of educational attainment. Consumption is separated into different spending categories to better understand where additional spending occurs. As wage varies across educational groups, spending and savings patterns differ across consumption categories. The Consumer Expenditure Survey, conducted by U.S. Bureau of Labor Statistics, will be used to measure the difference in spending patterns. Groups will be separated and evaluated by educational attainment and include: high school graduates, some college, associate's degree,

bachelor's degree, and master's degree or higher. This differs from the income histogram in the first objective with technical college being replaced by the current national standard of some college, and includes individuals who have occupational certificates or post-secondary education with no degree, making a total of five educational groups as opposed to four.

National consumer spending data was compared to estimates conducted by the U.S. Bureau of Economic Analysis. Consumer spending is taken quarterly by the U.S. Bureau of Economic Analysis and subcategorized by state, but not by educational attainment. As discussed in the literature review, most adjustments in consumption are small, as Utah is generally commensurate to national spending. Because spending nationally is within 3% categorically compared to Utah, the proportions from Bureau of Labor Statistics Consumer Expenditure Survey will be used. Measures are then transformed to be representative of individual Utah wages using the ACS and are shown in Table 4 below. For estimates adjusted by the separate U.S. Bureau of Economic Analysis survey, see Appendix Table 1.

Table 3: Utah's individual consumption expenditures by educational attainment (2018)

Description	High school graduate	High school graduate some college	Associate's degree	Bachelor's degree	Master's degree or higher
Income before taxes	\$ 33,795.00	\$ 34,828.00	\$ 38,308.00	\$ 59,387.00	\$ 97,270.00
Per capita personal consumption expenditures	\$ 31,267.28	\$ 28,955.10	\$ 32,703.12	\$ 44,407.05	\$ 67,326.34
APC(%)	92.52%	83.14%	85.37%	74.78%	69.22%
Non-Durable Goods					
Food at home	\$ 2,824.24	\$ 2,327.76	\$ 2,443.41	\$ 3,025.85	\$ 4,106.76
Food away from home	\$ 1,657.85	\$ 1,658.05	\$ 1,825.79	\$ 2,593.85	\$ 3,659.55
Apparel and footwear	\$ 901.82	\$ 857.28	\$ 899.65	\$ 1,412.76	\$ 2,011.06
Gasoline and other fuels	\$ 1,358.88	\$ 1,190.93	\$ 1,400.81	\$ 1,438.57	\$ 1,716.21
Durable Goods					
Transportation	\$ 5,501.04	\$ 4,977.15	\$ 5,966.95	\$ 6,943.98	\$ 9,546.70
Motor vehicles and parts	\$ 480.81	\$ 458.70	\$ 564.63	\$ 631.72	\$ 858.46
Household furniture and equipment	\$ 1,112.33	\$ 884.93	\$ 1,033.22	\$ 1,434.88	\$ 2,331.30
Services					
Healthcare	\$ 2,905.33	\$ 2,365.63	\$ 2,772.91	\$ 3,637.29	\$ 4,966.63
Housing	\$ 11,310.05	\$ 9,656.11	\$ 10,260.98	\$ 14,214.88	\$ 21,563.67
Utilities	\$ 2,760.35	\$ 2,295.29	\$ 2,376.62	\$ 2,676.81	\$ 3,428.18
Entertainment and recreation	\$ 1,454.71	\$ 1,498.13	\$ 2,180.69	\$ 2,403.97	\$ 3,391.50
Personal care products and services	\$ 356.31	\$ 360.71	\$ 414.50	\$ 588.09	\$ 815.43
Gross output of nonprofit institutions	\$ 454.60	\$ 495.97	\$ 516.61	\$ 825.29	\$ 1,781.81
Taxes					
Federal Taxes	\$ 1,645.56	\$ 3,115.90	\$ 3,242.61	\$ 7,351.40	\$ 15,066.35
State Taxes	\$ 567.63	\$ 838.64	\$ 926.70	\$ 1,847.84	\$ 3,507.89
Savings	\$ 2,527.72	\$ 5,872.90	\$ 5,604.88	\$ 14,979.95	\$ 29,943.66



Non-weighted average consumption across all groups is \$40,931.78. As education increases, in almost all cases, more income is earned and total-dollars are used for consumption; however, a smaller percentage of total income is used for consumption expenditures. In addition, the way people spend money differs across educational attainment groups. The largest sub-categories of spending are housing, transportation, taxes, and healthcare. For more specific definitions of which goods make up each sub-category, refer to the data dictionary from the U.S. Bureau of Labor Statistics Consumer Expenditure Survey (BLS, 2020).

2.4 Objective Three

The third objective is to understand where additional spending occurs, and in which categories. To understand the additional spending, only the difference between those who pursued post-secondary education and those who have obtained high school education is taken. The same education groups from the Consumer expenditure Survey used in objective two are also used here. Each level of educational attainment is considered against the group with a high school diploma only. A better understanding of how much value added those with post-secondary degrees contribute to the economy is gained by taking each categorical variable in the Consumer Expenditure Survey. Then by subtracting the average consumption in each category spent by high school graduates only, additional spending in each category can be obtained. The results of this exercise are in Table 4 below.

Table 4: Spending differences per educational attainment (2018, as compared to high school graduation only)

Description	High school graduate some college	Associate's degree	Bachelor's degree	Master's degree or higher
Income before taxes	\$ 1,033.00	\$ 4,513.00	\$ 25,592.00	\$ 63,475.00
Per capita personal consumption expenditures	\$ (2,312.18)	\$ 1,435.85	\$ 13,139.78	\$ 36,059.06
APC(%)	83%	85%	75%	69%
Non-Durable Goods				
Food at home	\$ (496.48)	\$ (380.83)	\$ 201.62	\$ 1,282.53
Food away from home	\$ 0.20	\$ 167.95	\$ 936.01	\$ 2,001.70
Apparel and footwear	\$ (44.54)	\$ (2.17)	\$ 510.94	\$ 1,109.23
Gasoline and other fuels	\$ (167.94)	\$ 41.93	\$ 79.69	\$ 357.33
Durable Goods				
Transportation	\$ (523.89)	\$ 465.91	\$ 1,442.94	\$ 4,045.67
Motor vehicles and parts	\$ (22.11)	\$ 83.82	\$ 150.91	\$ 377.65
Household furniture and equipment	\$ (227.40)	\$ (79.11)	\$ 322.55	\$ 1,218.97
Services				
Healthcare	\$ (539.69)	\$ (132.42)	\$ 731.97	\$ 2,061.30
Housing	\$ (1,653.94)	\$ (1,049.07)	\$ 2,904.83	\$ 10,253.62
Utilities	\$ (465.05)	\$ (383.72)	\$ (83.54)	\$ 667.83
Entertainment and recreation	\$ 43.42	\$ 725.98	\$ 949.26	\$ 1,936.79
Personal care products and services	\$ 4.40	\$ 58.20	\$ 231.78	\$ 459.12
Gross output of nonprofit institutions	\$ 41.37	\$ 62.01	\$ 370.69	\$ 1,327.21
Taxes				
Federal Taxes	\$ 1,470.34	\$ 1,597.05	\$ 5,705.84	\$ 13,420.79
State Taxes	\$ 271.01	\$ 359.06	\$ 1,280.20	\$ 2,940.26
Savings	\$ 3,345.18	\$ 3,077.15	\$ 12,452.22	\$ 27,415.94



To visually represent the magnitude of dollar change, green color mapping is used. Higher dollar values of change are more highly saturated than smaller changes on a continuous scale.

3 | DISCUSSION

Each education group, including to a lesser degree those with advanced degrees, follows a right skewed distribution one year after graduation. This is likely due to the increased difficulty of finding work immediately after post-secondary completion. A study by the University of Washington showed that it takes a college graduate, on average, three-to-six months to secure employment following graduation. In addition, 53% of graduates with a bachelor's degree are initially (one year) unemployed or working in a job that does not require a degree (University of Washington, 2019). Changes in wage in every level of education showed a statistically significant increase (See Appendix Table 3). Five years after graduation each educational group takes on a more normal distribution; however, some bimodality exists with individuals still making limited income. This may be the result of unemployment or continuing education after the initial degree. This theory is supported as the bimodality decreases when higher levels (bachelor's degree and above) of education are achieved.

Both living- and middle-class income follow the same trend where those with higher educational attainment have a greater share crossing both wage thresholds. For example, one year after graduating from their respective programs 81.7% of individuals with a master's degree or higher earned a living wage. This is contrasted by those with a technical certificate, where only 38.1% of graduates made a living wage. Trends for five-year growth also follow the same pattern where increased education correlates with higher wages. In fact, 88.3% of graduates from a master's degree program or higher make a living wage after five years, while only 62.8% of technical college graduates cross that threshold. This growth shows the importance of building human capital. As an individual gains skills, knowledge and expertise from higher education, they are more likely to cross the thresholds of living- and middle-class wages.

The greatest change in living wage income from one-year to five-years comes from a 31.8% increase in individuals with an associate's degree. This change is likely the result of gained experience over time, or an associate degree leading to continued education with a higher degree (i.e. a bachelor's degree or higher). The greatest change using the middle-class income threshold comes

from individuals holding a bachelor's degree, who saw a 31% percent increase from one to five years of employment post-graduation. Full changes for each educational group as a percentage for the 2013 cohort can be seen in Appendix Table 2.

Consumption has been a driving factor in economic recovery following the 2008 recession. In 2019, consumer expenditures marginally increased by 3.2% as compared to the third quarter in 2018 (U.S. Bureau of Economic Analysis, 2019). Consumption trends generally sway toward individuals with less education and income spending a larger share of income on goods and services. This trend is explained by the law of diminishing marginal utility, meaning consumers derive less and less satisfaction from an item as they consume more of it (Romer, 2012). Because fewer individuals with less education cross living- and middle-class wage thresholds less income is available to consume goods and services. This is seen more clearly when comparing how much wage, as a percentage, is spent on consumption in each educational group. Those with a high school diploma only, have an average propensity to consume approximately 93% of their income annually. As wages increase to \$100,000 annually, the percentage of consumption is less than 70%. This lack of savings among those with only a high school diploma may not only influence consumption patterns in the short-run, but restrict individuals from achieving long-term goals like retirement.

Although income is a major factor in consumption trends, educational attainment may also be a factor in savings trends. The ability to save increases as income increases. Porter Bennet, an economist with the University of Colorado, observed that education plays a role in the amount of savings and the asset classes that savings are invested into. Bennett found the higher the educational attainment an individual obtains, the more diversification and less risk savings went into (Bennett, 2018). This highlights the value of education not only on the ability to consume but to save. Savings for those with high school attainment only were estimated at just over \$2,000 annually. Those with a master's degree or higher, by contrast, are able to save more than 10 times that amount.

One exception to the spending trend is individuals with a bachelor's degree or higher spend a greater share of their income on home services, donations to non-profit organizations, and taxes. This can be explained because home services are a luxury good, or goods where demand rises with higher income. Donations are likely easier to make for those with higher income, while taxes are scheduled on a progressive system in the United States.



Utah's unique trends in wage equality, compared to the national average, affect consumption. The highest level of equality exists among those with only a high school diploma, some college, or an associate degree. In 2018, average wage for an individual with an associate degree was \$4,513 more than a high school diploma only. Per the Gini Index score of .423, Utah's wage equality is the highest in the nation (United Health Foundation, 2019). Because the high school graduates only, some college, and associate degree group's wages are similar, some categories show less spending for those with some post-secondary education than high school graduates only.

Areas where the most additional spending occurred are commensurate with where the most spending occurs in general. Those with higher educational attainment (bachelor's degree or higher) tend to spend more on housing, healthcare, transportation and taxes. Those with a bachelor's degree or higher spends a larger share of their income on entertainment, recreation, and food away from home. These two categories are considered luxury goods that are generally pursued after basic needs (i.e., food, housing, and healthcare) are met. Large increases in spending within these categories generally take place after large income increases occur. More spending does occur in entertainment and personal care products for those with some college, or an associate degree, but not as much as those with a bachelor's degree or higher. Categories where the highest amount is spent is where policy makers can expect the most goods and service tax to be collected by those with post-secondary education.

Other categories do not show the same increases with additional education and remain more constant despite income increases. This is explained by the income elasticity of demand. Goods can be separated into several categories depending on the elasticity from changes in price. Normal goods demand increases as income increase. The normal good pattern can be seen in housing, healthcare, and food purchases. Luxury goods tend to increase at a higher as income rises. Goods that followed this pattern are recreation, and food away from home. Finally, certain goods show relatively flat consumption across education groups such as gasoline and utilities. These certain goods follow the law of diminishing marginal utility, where consumers cannot use and do not gain additional happiness from their use.

4 | CONCLUSION

Labor demand continues to shift the workforce in favor of individuals with post-secondary education. This is evident from a higher likelihood to make sufficient wages, and higher rates of consumption. In turn, higher education leads to an increased likelihood of making sufficient wage to pay for food, housing, and healthcare. As more education is obtained, a greater percentage of individuals consistently traverse living- and middle-class wage thresholds as defined in the study (2011 - 2013 cohorts). More individuals, regardless of educational attainment, attain a living- and middle-class wage five years after graduation. Wage tends to plateau from linear growth 10 years after graduation (Kim, 2019). As this study was limited to five years in the workforce, additional studies on wages during the later stages of careers is recommended as more data becomes available. This will provide a better longitudinal understanding of the relationship between education and wages.

Moreover, higher incomes that are derived from higher education lead to higher amounts of consumption. The highest annual dollar amount of consumption for 2018 was estimated at \$67,326, and came from the educational group with a master's degree or higher. By contrast, the lowest annual dollar amount spent was from those who have obtained a high school diploma only. Although those with post-secondary education spend more (dollar-wise) on consumption goods and services, those with a high school diploma only spend a greater share of their income on consumption.

Those with a high school education spent 92.52% of their income on consumption, while those with an advanced degree spent only 69.22%. This may suggest that the ability to save one's earnings decreases for those with less education because a higher percentage of their income is spent on basic needs. Individuals with a master's degree or higher are able to save more than 10 times the amount than those with high school education only. Lack of savings makes these individuals more vulnerable to short-term economic shocks, and less prepared for retirement (Morrissette, 2019).

Because of Utah's higher-than-average wage equality in the country, additional spending for individuals who have some college but no degree, or an associate's degree did not see the same increases in consumption as the national average. Categories where the most additional spending occurred in housing, transportation, and healthcare. Additional spending also occurred in recreation, entertainment, and food away from home.



Higher education, on all levels of the study, was shown to benefit the individual by increasing their likelihood to earn a higher income, which allows them to increase consumption. This increase in consumption benefits the state from both increased economic activity and potential sales tax collected.

DATA PARTNERS



REFERENCES

Data Cited

- American Community Survey. (2019) About PUMS. United States Census Bureau. <https://www.census.gov/programs-surveys/acs/technical-documentation/pums/about.html>
- Engaging Data. (2019). How do American Spend Money? US Households Spending Breakdown by Education Level. <https://engaging-data.com/household-spending-education/>
- Federal Reserve Bank of St. Louis. (2019). Total Gross Domestic Product for Utah (UTNGSP). <https://fred.stlouisfed.org/series/UTNGSP>
- Federal Reserve Bank of St. Louis. (2019). Real Median Household in Utah (MEHOINUSUTA672N). <https://fred.stlouisfed.org/series/MEHOINUSUTA672N>
- Glasmeier, Amy. (2019). Living Wage Calculator. Massachusetts Institute of Technology. <http://livingwage.mit.edu/counties/49035>
- U.S. Bureau of Economic Analysis (BEA). (2019). Per capita personal consumption expenditures (PCE) by state (SAEXP2). <https://apps.bea.gov/iTable/iTable.cfm?acrdn=4&isuri=1&reqid=70&step=1#reqid=70&step=1&isuri=1>
- U.S. Bureau of Labor Statistics. (2019). Consumer Expenditure Surveys (CE) BLS. <https://www.bls.gov/cex/home.htm>
- U.S. Department of Health and Human Services. (2019). HHS Poverty Guidelines for 2019. January 11, 2019. <https://aspe.hhs.gov/poverty-guidelines>

Works Cited

- Alichi, A., Kantenga, K., & Sole, J. (2016). Income polarization in the United States. IMF Working Papers. Retrieved from <https://search-ebscohost-com.ezproxy.snhu.edu/login.aspx?direct=true&db=edsgit&AN=edsgit.A467147316&site=eds-live&scope=site>
- Awuku-Budu, C., Fallon, T., Kublashvili, S., & Zemanek, S. (2017). Personal Consumption Expenditures by State: New Statistics for 2016 and Updated Statistics for 2014 and 2015. Survey of Current Business, (11), 1. Retrieved from <https://search-ebscohost-com.ezproxy.snhu.edu/login.aspx?direct=true&db=edsggo&AN=edsgcl.534652422&site=eds-live&scope=site>
- Bennett, Porter (2018) "Examining the Effects of Education on Financial Savings Behavior" University of Colorado. https://scholar.colorado.edu/cgi/viewcontent.cgi?article=2879&context=honr_theses
- Blagg, Kristen (2018) "The Rise of Masters Degree's" The Urban Institute December 2018 https://www.urban.org/sites/default/files/publication/99501/the_rise_of_masters_degrees.pdf
- Blanchard, E., & Willmann, G. (2016). Trade, education, and the shrinking middle class. Journal of International Economics. <https://doi-org.ezproxy.snhu.edu/10.1016/j.jinteco.2015.10.007>



-
- Bosancianu, C. M. (2017). A Growing Rift in Values? Income and Educational Inequality and Their Impact on Mass Attitude Polarization. *Social Science Quarterly* (Wiley-Blackwell), 98(5), 1587–1602. <https://doi-org.ezproxy.snhu.edu/10.1111/ssqu.12371>
- Campos, P. (2018). The Economics of American Higher Education in the New Gilded Age. *Utah Law Review*, (Issue 4), 867. Retrieved from <https://search-ebshost-com.ezproxy.snhu.edu/login.aspx?direct=true&db=edshol&AN=edshol.hein.journals.utahlr2018.29&site=eds-live&scope=site>
- Carroll, C., Slacalek, J., Tokunaka, K., & White, M. N. (2017). The Distribution of Wealth and the Marginal Propensity to Consume. *Quantitative Economics*, 8(3), 977–1020. Retrieved from <https://search-ebshost-com.ezproxy.snhu.edu/login.aspx?direct=true&db=ecn&AN=1694066&site=eds-live&scope=site>
- Deskins, John Brian Hill, & M. H. Tuttle. (2008). How Does State and Local Education Spending Affect State Economic Growth in the Long Run? Proceedings. Annual Conference on Taxation and Minutes of the Annual Meeting of the National Tax Association, 101, 149–155. Retrieved from <http://www.jstor.org/stable/prancotamamnta.101.149>
- Drucker, J. (2016). Reconsidering the Regional Economic Development Impacts of Higher Education Institutions in the United States. *Regional Studies*, 50(7), 1185–1202. <https://doi-org.ezproxy.snhu.edu/10.1080/00343404.2014.986083>
- Duffy, F. (2019). Labor Economics. Salem Press Encyclopedia.
- Fernández-Villaverde, J., & Krueger, D. (2007). Consumption over the Life Cycle: Facts from Consumer Expenditure Survey Data. *The Review of Economics and Statistics*, 89(3), 552–565. Retrieved from www.jstor.org/stable/40043048
- Fisher, M. R.: “Explorations in Savings Behavior,” *Bulletin of the Oxford University Institute of Statistics*, vol. 18, pp. 201–277, August 1956.
- Foster, Anne C. (2014). New education classification better reflects income and spending patterns in the Consumer Expenditure Survey. Beyond the Numbers Volume 3 Number 1. U.S. Bureau of Labor Statistics. <https://www.bls.gov/opub/btn/volume-3/pdf/education-classification-and-income-and-spending-patterns.pdf>
- Fottrell, Quentin and Paul, Kari (2019). The No. 1 reason you’re still broke even if you received a pay raise last year. *Market Watch*. Accessed online 10 Sep. 2019 <https://www.marketwatch.com/story/despite-wage-growth-the-average-american-suffers-as-cost-of-living-rises-at-a-faster-pace-2019-01-10>
- Fox, Liana. (2018). The Supplemental Poverty Measure: 2017. Census. Current Population Reports P60-265. <https://www.census.gov/content/dam/Census/library/publications/2018/demo/p60-265.pdf>
- Friedman, M.: *A Theory of the Consumption Function*, Princeton University Press for National Bureau of Economic Research, Princeton, N.J., 1957.
- Hanushek, Eric & Woessmann, Ludger. (2015). The economic impact of educational quality. *Handbook of International Development and Education*. Edward Elgar Publishing. 6-17 Retrieved from Google Books



-
- Iowa Department of Education, & Economic Modeling Specialists International (EMSI). (2017). Analysis of the Economic Impact and Return on Investment of Education: The Economic Value of Iowa's Community Colleges. Main Report. Iowa Department of Education. Retrieved from <https://search-ebscohost-com.ezproxy.snhu.edu/login.aspx?direct=true&db=eric&AN=ED583737&site=eds-live&scope=site>
- Kem C. Gardner Policy Institute. (2018). Fact Sheet Utah at a Glance. The University of Utah. https://gardner.utah.edu/wp-content/uploads/UtahAtAGlance_20180207.pdf
- Keynes, John M. (1936). The General Theory of Employment, Interest and Money. New York: Harcourt Brace Jovanovich. p. 96.
- Kim, C., & Tamborini, C. (2019). Are They Still Worth It? The Long-Run Earnings Benefits of an Associate Degree, Vocational Diploma or Certificate, and Some College. RSF: The Russell Sage Foundation Journal of the Social Sciences, 5(3), 64-85. doi:10.7758/rsf.2019.5.3.04
- Lavaughn M., Henry "Income Inequality and Income-class Consumption Patterns." Economic Commentary (Cleveland) (2014): Economic Commentary (Cleveland), Oct 6, 2014. Web.
- Ludvigson, Sydney, C. 2004. "Consumer Confidence and Consumer Spending." Journal of Economic Perspectives, 18 (2): 29-50.
- Michael Hout Social and Economic Returns to College Education in the United States Annual Review of Sociology 2012 38:1, 379-400
- Miller, Leroy "Economics Today: The Macro View 19th Edition" Pearson Publishing. Arlington Texas.
- Malmendier, U. and L. S. Shen (2015). Experience Effects in Consumption. Working paper, UC-Berkeley.
- Moretti, E. (2004). Estimating the social return to higher education: evidence from longitudinal and repeated cross-sectional data. Journal of Econometrics, 121, 175 - 212
- Morrissey, Monique (2019). "The State of American Retirement Savings". Economic Policy Institute. <https://www.epi.org/publication/the-state-of-american-retirement-savings/>
- Murdock, S. H., Cline, M. E., Zey, M. A., Jeanty, P. W., & Perez, D. (2014). Changing Texas : Implications of Addressing or Ignoring the Texas Challenge. College Station: Texas A&M University Press. Retrieved from <https://search-ebscohost-com.ezproxy.snhu.edu/login.aspx?direct=true&db=nlebk&AN=747067&site=eds-live&scope=site>
- Oklahoma State Regents for Higher Education. (2018). Degrees of Progress: The State of Higher Education in Oklahoma. 2017 Annual Report. Oklahoma State Regents for Higher Education. Oklahoma State Regents for Higher Education. Retrieved from <https://search-ebscohost-com.ezproxy.snhu.edu/login.aspx?direct=true&db=eric&AN=ED591040&site=eds-live&scope=site>
- Pace, Levi. (2018) Defining Utah's Middle Class. Policy Brief: Oct. 2018. Kim C. Gardner Policy Institute. <https://gardner.utah.edu/wp-content/uploads/Middle-Class-Policy-Brief-Oct2018.pdf>



-
- Pew Research Center. 2015. "The American Middle Class Is Losing Ground." Accessed June 25, 2018. <http://www.pewsocialtrends.org/2015/12/09/the-american-middle-class-is-losingground/>.
- Phillips, E. W. (1976). EDUCATION, INCOME, AND HUMAN BEHAVIOR (Book). *Annals of Regional Science*, 10(2), 143. Retrieved from <https://search-ebscohost-com.ezproxy.snhu.edu/login.aspx?direct=true&db=bsu&AN=5809466&site=eds-live&scope=site>
- Rodriguez, J., Urzua, S., & Reyes, L. (2016). Heterogeneous economic returns to post-secondary degrees: evidence from Chile. *Journal of Human Resources*, (2). Retrieved from <https://search-ebscohost-com.ezproxy.snhu.edu/login.aspx?direct=true&db=edsbig&AN=edsbig.A451918419&site=eds-live&scope=site>
- Romer, David. (2012). *Advanced macroeconomics*. New York :McGraw-Hill/Irwin,
- Sarial-Abi, G., Gürhan-Canli, Z., Kumkale, T., & Yoon, Y. (2016). The effect of self-concept clarity on discretionary spending tendency. *International Journal of Research in Marketing*, 33(3), 612-623. <https://doi-org.ezproxy.snhu.edu/10.1016/j.ijresmar.2015.09.010>
- Sievertsen, H. H. (n.d.). Local unemployment and the timing of post-secondary schooling. *ECONOMICS OF EDUCATION REVIEW*, 50, 17-28. <https://doi-org.ezproxy.snhu.edu/10.1016/j.econedurev.2015.11.002>
- Solomon, Lewis. (1975). Education, Income, and Human Behavior. NBER. Pages 253-294. <https://www.nber.org/chapters/c3700.pdf>
- Syverud, G., Williams, C., & New England Board of Higher Education. (2016). Higher Education's Impact on the New England Economy: Investing in People. A Study of Higher Education & Human Capital. New England Board of Higher Education. New England Board of Higher Education. Retrieved from <https://search-ebscohost-com.ezproxy.snhu.edu/login.aspx?direct=true&db=eric&AN=ED590935&site=eds-live&scope=site>
- Tyndorf, D., & Martin, H. (2018). Reconsidering Our Graduation Efforts: The Economic Impact of Certificates, Associate's, and Bachelor's Degrees. *Community College Journal of Research and Practice*, 42(7), 489-503. Retrieved from <https://search-ebscohost-com.ezproxy.snhu.edu/login.aspx?direct=true&db=eric&AN=EJ1177563&site=eds-live&scope=site>
- United Health Foundation. (2018). Income Inequality – Gini Index (Utah). America's Health Rankings. <https://www.americashealthrankings.org/explore/annual/measure/gini/state/UT>
- University of Washington. (2019) What can students do to improve their chances of finding employment after college? Disabilities, Opportunities, Internetworking, and Technology. Published 04/30/2019 <https://www.washington.edu/doit/what-can-students-do-improve-their-chances-finding-employment-after-college>
- U.S. Bureau of Labor Statistics (2020). Consumer Expenditure Surveys (Data Dictionary) <https://www.bls.gov/cex/pumd.htm>
- U.S. Bureau of Labor Statistics (2019). Employment, wages, and projected change in employment by typical entry level education. <https://www.bls.gov/emp/tables/education-summary.htm>

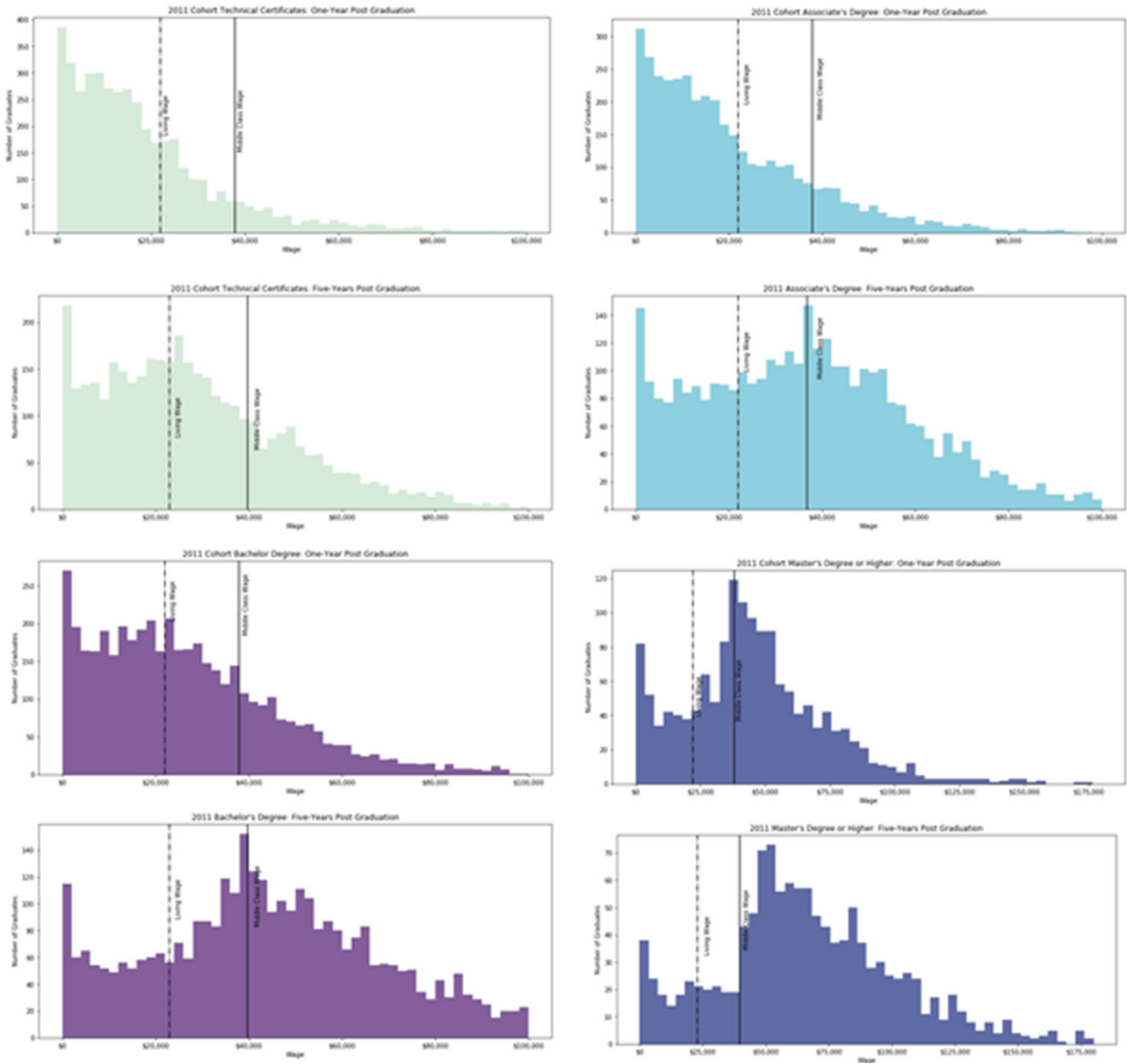


-
- U.S. Bureau of Labor Statistics (2017). Profile of Labor Force by Educational Attainment. <https://www.bls.gov/spotlight/2017/educational-attainment-of-the-labor-force/pdf/educational-attainment-of-the-labor-force.pdf>
- U.S. Census Bureau: Highest Educational Levels Reached by Adults in the U.S. Since 1940. PR Newswire US. Retrieved from https://www.census.gov/library/visualizations/2017/comm/cb17-51_educational_attainment.html
- U.S. Census Bureau. Income Inequality Gini Index. (2016). United States Census Bureau <https://www.census.gov/topics/income-poverty/income-inequality/about/metrics/gini-index.html>
- Utah Department of Workforce Services. (2019). Consumer Price Index (CPI) and Cost of Living Comparisons. <https://jobs.utah.gov/wi/data/library/wages/costofliving.html>
- Utah Department of Workforce Services. (2019). Personal Consumption Expenditures (PCE) by State. <https://jobs.utah.gov/wi/data/library/other/pce.html>
- Utah System of Technical Education (2018). 2018 Annual Report (December Release). [http://www.utech.edu/assets/docs/Annual%20Report%202018%20\(December%20Release\).pdf](http://www.utech.edu/assets/docs/Annual%20Report%202018%20(December%20Release).pdf)
- Valero, A., & Van Reenen, J. (2019). The Economic Impact of Universities: Evidence from across the Globe. *Economics of Education Review*, 68, 53–67. Retrieved from <https://search-ebSCOhost-com.ezproxy.snhu.edu/login.aspx?direct=true&db=ecn&AN=1752635&site=eds-live&scope=site>
- Washington State Board for Community and Technical Colleges, & Economic Modeling Specialists International (EMSI). (2016). Analysis of the Return on Investment and Economic Impact of Education: The Economic Value of Washington's Community and Technical Colleges. Main Report. Washington State Board for Community and Technical Colleges. Washington State Board for Community and Technical Colleges. Retrieved from <https://search-ebSCOhost-com.ezproxy.snhu.edu/login.aspx?direct=true&db=eric&AN=ED573061&site=eds-live&scope=site>
- Wienclaw, R. A. (2019). Educational Sociology: Education and Economic Development. Salem Press Encyclopedia. Retrieved from <https://search-ebSCOhost-com.ezproxy.snhu.edu/login.aspx?direct=true&db=ers&AN=89185447&site=eds-live&scope=site>

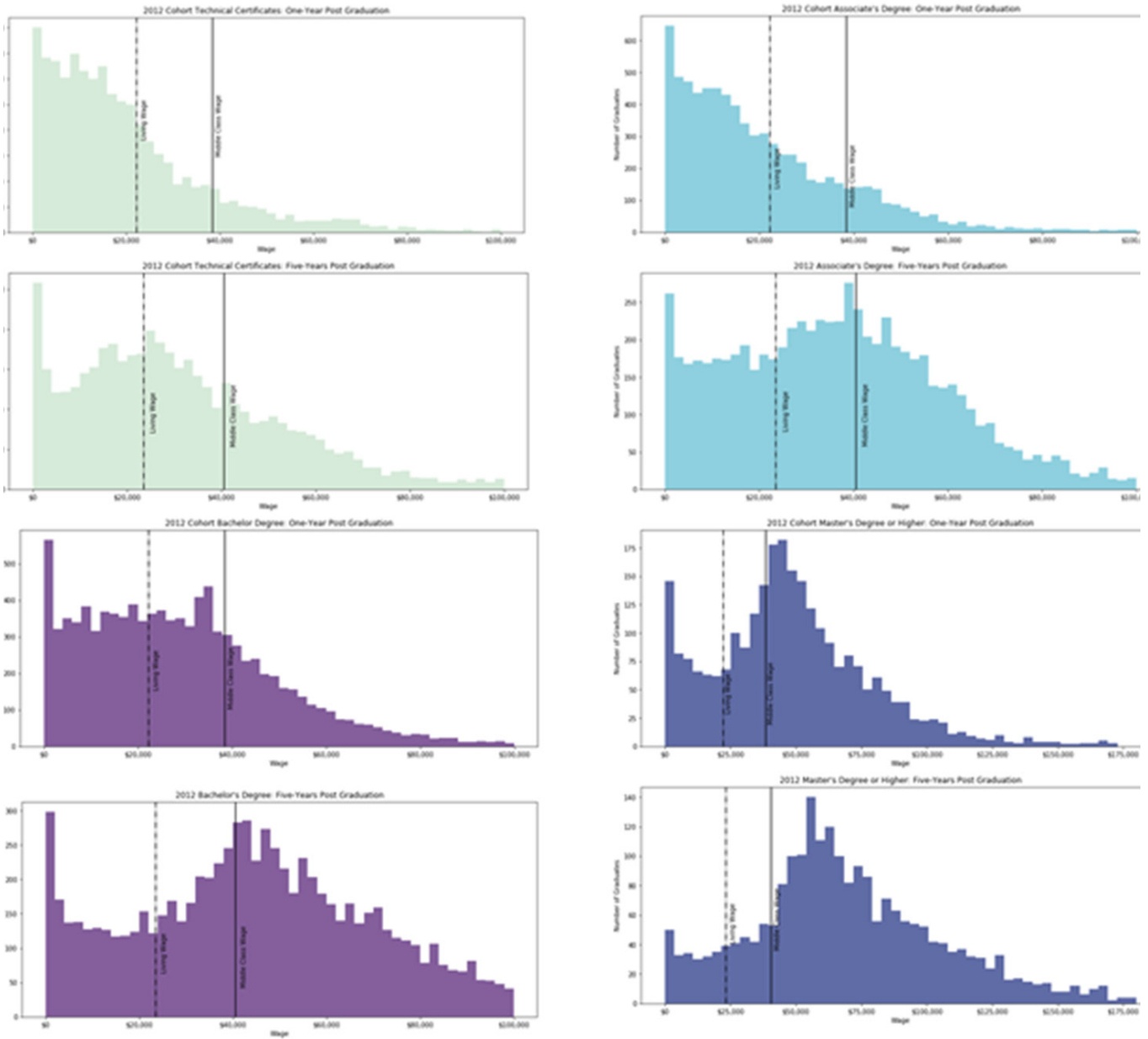


APPENDIX

Appendix Figure 1: 2011 Cohort Income by Educational Attainment (Histogram).



Appendix Figure 2: 2012 Cohort Income by Educational Attainment (Histogram).



Appendix Table 1: Utah's individual consumption by educational attainment (201) BEA adjusted figures

Description	High school graduate	High school graduate with some college	Associate's degree	Bachelor's degree	Master's, professional, doctoral degree	Adjustment
Income before taxes	\$ 33,795.00	\$ 34,828.00	\$ 38,308.00	\$ 59,387.00	\$ 97,270.00	
Per capita personal consumption expenditures	31267.28	28955.10	32703.12	44407.05	67326.34	
APC(%)	92.52%	83.14%	85.37%	74.78%	69.22%	
Durable goods						
Motor vehicles and parts	\$ 485.50	\$ 463.17	\$ 570.13	\$ 637.88	\$ 866.82	1.00975
Furnishings and durable household equipment	\$ 1,119.20	\$ 890.40	\$ 1,039.60	\$ 1,443.74	\$ 2,345.69	1.00617
Nondurable goods						
Food and beverages purchased for off-premises consumption	\$ 4,481.16	\$ 3,984.98	\$ 4,268.87	\$ 5,618.55	\$ 7,764.71	0.99979
Clothing and footwear	\$ 903.69	\$ 859.05	\$ 901.51	\$ 1,415.68	\$ 2,015.22	1.00207
Gasoline and other energy goods	\$ 1,363.63	\$ 1,195.10	\$ 1,405.70	\$ 1,443.60	\$ 1,722.21	1.00350
Services						
Household consumption expenditures (for services)	\$ 390.67	\$ 330.04	\$ 335.24	\$ 410.93	\$ 525.25	0.97338
Housing and utilities	\$ 11,251.35	\$ 9,605.99	\$ 10,207.73	\$ 14,141.11	\$ 21,451.76	0.99481
Health care	\$ 2,824.07	\$ 2,299.47	\$ 2,695.35	\$ 3,535.56	\$ 4,827.71	0.97203
Transportation services	\$ 5,490.60	\$ 4,967.70	\$ 5,955.62	\$ 6,930.80	\$ 9,528.59	0.99810
Recreation services	\$ 1,477.96	\$ 1,522.08	\$ 2,215.54	\$ 2,442.39	\$ 3,445.70	1.01598
Food services and accommodations	\$ 1,647.27	\$ 1,647.47	\$ 1,814.15	\$ 2,577.31	\$ 3,636.20	0.99362
Gross output of nonprofit institutions	\$ 447.89	\$ 488.65	\$ 508.98	\$ 813.11	\$ 1,755.51	0.98524
Taxes						
Federal Taxes	\$ 1,645.56	\$ 3,115.90	\$ 3,242.61	\$ 7,351.40	\$ 15,066.35	
State Taxes	\$ 567.63	\$ 838.64	\$ 926.70	\$ 1,847.84	\$ 3,507.89	
Savings	\$ 2,527.72	\$ 5,872.90	\$ 5,604.88	\$ 14,979.95	\$ 29,943.66	

Appendix Table 2: 2013 Cohort of Wage Thresholds One and Five-Years Post Graduation

Educational Attainment	(%) Living wage one-year after graduation	(%) Living wage five-years after graduation	(%) Difference - Living wage	(%) Middle class wage one-year after graduation	(%) Middle class wage five-years after graduation	(%) Difference - Middle class wage
Technical Certificate	38.08%	62.77%	24.69%	15.21%	32.26%	17.05%
Associates Degree	39.51%	71.30%	31.79%	18.32%	45.46%	27.14%
Bachelors Degree	59.30%	80.01%	20.71%	30.59%	61.64%	31.05%
Masters or Above	81.70%	88.26%	6.56%	65.41%	81.35%	15.94%

Appendix Table 3: 2013 Linear Regression on Wages One and Five-Years Post Graduation

Educational Attainment	Intercept	Coefficient (Five-Year)	Standard Deviation	P-Value
Technical Certificate	22941.31	13077.57	591.59	1.1E-105
Associate Degree	22555.30	18746.52	397.70	0
Bachelor's Degree	30655.95	24726.40	489.98	0
Master's Degree or Higher	51490.81	30705.03	1630.66	2.03E-76

