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The Changing Economics of Attaining Post-Secondary Education in the U.S.: An Analysis by Stakeholder: Employer, Student, and Government

Sheila Cappel

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The Changing Economics of Attaining Post-Secondary Education in the U.S.: An Analysis by
Stakeholder: Employer, Student, and Government

by

Sheila Cappel

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree

Of

Executive Doctorate in Business

In the Robinson College of Business

Of

Georgia State University

GEORGIA STATE UNIVERSITY

ROBINSON COLLEGE OF BUSINESS

2019

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ACCEPTANCE

This dissertation was prepared under the direction of the *SHEILA CAPPEL* Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Business Administration in the J. Mack Robinson College of Business of Georgia State University.

Richard Phillips, Dean

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS	iv
LIST OF TABLES	x
LIST OF FIGURES	xi
I INTRODUCTION	1
1.1 Historical Context	4
1.2 Importance of Topic and Contemporary Indicators	5
1.3 Research Question	8
II CHAPTER 2 - LITERATURE REVIEW	11
II.1 Theoretical Framing: The Economic Argument.....	11
II.2 What is human capital theory?.....	12
II.3 How does it work?.....	13
II.4 Why does it work?	14
II.5 Theoretical Framing: The Sociological Argument	15
II.6 Contemporary Literature Review	17
II.7 Modeling a Stakeholder Analysis	18
II.7.1 Stage 1: The Student Stakeholder Model.....	18
II.7.2 Stage 2: The Employer Stakeholder Model	21
II.7.3 Stage 3: The Government Stakeholder Model.....	30
III CHAPTER 3 – RESEARCH METHOD, ANALYSIS & RESULTS.....	32
III.1 Stage 1: The Student Stakeholder Method, Analysis & Results.....	32
III.1.1 Question and Hypothesis:.....	36
III.1.2 Sample: Data Source	39
III.1.3 Variables:	40

III.1.3.1	<i>Lifetime Earnings- Dependent Variable</i>	41
III.1.3.2	<i>Education Attainment- Independent Variable</i>	42
III.1.3.3	<i>Cost- Independent Variable</i>	43
III.1.4	<i>Analysis</i>	45
III.1.5	<i>Results</i>	49
III.1.5.1	<i>General Results from Statistical Analysis of ACS 2012-2016 data</i>	49
III.1.5.2	<i>Comparative Results between Current Analysis and “College Payoff” study</i>	51
III.1.5.3	<i>Cost Comparison for Post-Secondary Education</i>	52
III.2	Stage 2: The Employer Stakeholder Method, Analysis & Results	56
III.2.1	<i>Question and Hypothesis</i>	56
III.2.2	<i>Sample: Data Source</i>	58
III.2.3	<i>Variables</i>	60
III.2.4	<i>Employer Interviews Content Analysis</i>	61
III.2.5	<i>Results</i>	64
III.2.5.1	<i>Macroeconomic Industry Themes</i>	64
III.2.5.2	<i>Microeconomic Employer Specific Themes</i>	68
III.3	Stage 3: The Government Stakeholder Method, Analysis & Results	79
III.3.1	<i>Question and Hypothesis</i>	80
III.3.2	<i>Method</i>	81
III.3.3	<i>Data Sources</i>	82
III.3.4	<i>Variables</i>	83
III.3.5	<i>Analysis</i>	86
III.3.6	<i>Results</i>	86

IV CHAPTER 4 – DISCUSSION & CONCLUSION	89
IV.1 Student Stakeholder Discussion	89
IV.2 Employer Stakeholder Discussion	90
IV.3 Government Stakeholder Discussion	91
IV.4 General Conclusion:	92
APPENDICES	96
Appendix A: Summary and Comparative Documents	96
<i>Exhibit 1: Occupational Analysis Summary Sheet</i>	<i>97</i>
<i>Exhibit 2: “College Payoff” Comparison Summary Sheet</i>	<i>98</i>
<i>Exhibit 3: College Comparison with Cost Build Up Summary Sheet</i>	<i>99</i>
<i>Exhibit 5: Interviewee Attribute Summary Sheet</i>	<i>102</i>
Appendix B: Primary Templates and Supportive Backup	103
<i>Exhibit 1: College Scorecard Template</i>	<i>103</i>
<i>Exhibit 2: Cost Calculator Assumptions</i>	<i>108</i>
<i>Exhibit 3: Occupational Analysis Worksheets</i>	<i>112</i>
<i>Exhibit 4: Construction Sector Definitions</i>	<i>159</i>
<i>Exhibit 5: Interview Tool – Employer: General</i>	<i>162</i>
<i>Exhibit 6: Interviewee Attribute Sheet Detail</i>	<i>165</i>
<i>Exhibit 7: Content Analysis: Node Design Hierarchy</i>	<i>166</i>
<i>Exhibit 8: Occupational Tax Workbooks</i>	<i>168</i>
<i>Exhibit 9: Bezos Quiz</i>	<i>183</i>
BIBLIOGRAPHY	184
VITA	187

LIST OF TABLES

Table 1: Occupation /Job Description.....	26
Table 2: Student Decision Alternative Occupational Outcomes	35
Table 3: ACS Data Records Profile: Florida.....	45
Table 4: Florida Industry Frequencies (ACS Data Sample).....	46
Table 5: ACS Sample: Construction Occupations Highest Number of Respondents by Occupation.....	47
Table 6: Construction Sector: Technology Frontiers McKinsey Global Institute 2017.....	67
Table 7: Construction Sector: Labor Force Categories	69
Table 8: Employer Interview Feedback: Target Labor Categories	69
Table 9: 2016 Tax Tables IRS.gov 2016 Payroll Tax Tables SSA.gov	82

LIST OF FIGURES

Figure 1: Labor Force Participation	8
Figure 2: Student Decision Model	20
Figure 3: Labor Pool Supply and Demand using Autor et. al, Skill Category Designations	30
Figure 4: Federal Government Revenue Streams.....	31
Figure 5: Net Benefit Generalized Model	37
Figure 6: Construction Occupational Composite Lifetime Earnings and NPV by occupational category	54
Figure 7: Employer Knowledge, Skills & Abilities (KSA) Requirements “Technical” & “Soft”	58
Figure 8: Content Analysis Design NVivo “Mind Map”	63
Figure 9: Government Stakeholder Impact Model.....	81

ABSTRACT

The Changing Economics of Attaining Post-Secondary Education in the U.S.: An Analysis by Stakeholder: Employer, Student, and Government

by

Sheila Cappel

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Chair: Dr. Dan Bellenger

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This paper has as its focus the identification of economic returns to stakeholders of investment in human capital as it pertains to attainment of post-secondary education in the US. The centerpiece of this study pertains to returns to prospective employers in a 21st century environment, which demands of the labor market rapid adaptation to technology and its applications. With dynamic demands from employers as a backdrop, this paper seeks to determine if the benefit of post-secondary education is becoming more or less relevant from the perspective of the employer. A qualitative approach comprised of in-depth interviews of employers has been conducted. In particular learnings from those employers regarding their views of the importance of technology and what impacts if any this has on expectations of post-secondary institutional curriculums.

The second stakeholder, the student, has been considered via a cost benefit analysis based upon expected earning differentials for the student group who has chosen to pursue a post-secondary education versus those who have not. Earnings have been quantified and extrapolated over the lifetime of defined student groups and compared to the actual cost of college with

considerations for occupational differentials, in order to determine the net value of a college education to a student.

This information has provided the basis for understanding the value of post-secondary education to the third stakeholder, the government. Projected income taxes for selected occupational groups have been calculated and compared based on the net present value of these lifetime earnings. The differential revenues that accrue to federal agencies via these taxes has been compared to the costs associated with attending post-secondary education. With this information in hand, conclusions have been made regarding policy implications for federal subsidies of post-secondary education.

INDEX WORDS: Post-Secondary Education, Labor Markets, Human Capital, Stakeholder

Analysis, Return on Investment

I INTRODUCTION

In an increasingly interdependent world economy depicted by fewer and fewer degrees of separation between countries, one cannot help but believe that the envisioned view of a single world labor market defined by comparative advantage as described by Milton Friedman is emerging as a reality. In one of his many works, "*Free to Choose*", Friedman addressed several topics on the forefront of American consciousness in the late 1970's, many of which remain relevant today nearly four decades later.

Friedman, a staunch free market proponent expertly sought to allay the popular view during his time that foreign imports would somehow threaten American economic preeminence on the world stage and rob our country of domestic jobs. Friedman used the steel industry as an example and argued that imported steel made sense for our country as long as our own labor was busy producing goods and services more highly valued than the steel imported. (Friedman 1979) Further he argued that unless steel was thought to be an item of national security, this evolution of foreign steel imports was the natural ordering of things in a free market economy, whether domestic or global.

Friedman's underlying assumption to this argument rested in the belief that everyone's best interest is served in a world economy that has evolved into a free market format where goods and services freely flow as the market dictates. This assumption he applied also to labor. In his example, the labor market of those countries producing steel for US consumption would begin to evolve in a more developed manner as depicted by increasing wages; while America utilized her labor to produce more highly valued goods and services to justify US labor's comparatively higher wages.

Friedman claimed the unparalleled economic growth exhibited in the United States from the industrial revolution to the date of his writing (1979) was the result of continuous investment in the traditional economic factors of production: land, labor and capital. Yes, Friedman described “accumulation of human capital in the form of “increased knowledge and skills and improved health and longevity” as an “essential” prerequisite to the exceptional economic growth sustained in the US over time. Indeed, he argued that investment in both physical assets and human capital “complemented” one another in the attainment of our current developed status and both were crucial in this achievement to date. (Friedman, 1979)

Projecting Friedman’s logic forward onto the US economy of the 21st century, an economy characterized by intense and rapid innovation and development, one can only imagine his viewpoint of the relative importance of investment in human capital as an urgent imperative in a world where investments in new innovative tangible and intangible assets must be complemented by adaptable and capable human interface.

Yet the fears of old remain with us. Attitudes regarding the harmful effects of foreign imports pervade our psyche. It is commonly thought that manufacturing plants located outside the US rob us of needed jobs and generate unemployment. Indeed, it is natural to distress for the individual manufacturing worker at the Carrier plant in Ohio who experiences the very personal hardship associated losing their job as a result of this migration of manufacturing to countries such as Mexico. Yet the political discourse continues to argue for bringing back jobs of old and shutting down free trade. The discourse seldom pivots to encompass an evaluation of possible long-term solutions that would include an investment in human capital at higher levels and with intensity required to complement and keep the pace with the highly innovative and technical aspects of our lives that are evolving at speeds and complexity barely comprehensible.

Beyond the undertaking to understand the labor market in a global context where labor (specific by occupation) supply and demand follow traditional comparative advantage dictates in open markets as Friedman expected, as if turning on an alternate axis is the changing nature of the very jobs we seek to understand. Evolving as a result of increased computerization and automation, requisite skills are changing. Evidence surrounds us as kiosks changes the need for bank tellers, as on-line consumerism changes the demand for retail support labor, as big data changes the brokerage trading dynamics and as advances in sensing equipment changes the prospect for driverless transportation and distribution of goods across our country. (Frey & Osborne, 2017) As each day passes some job occupations and therefore skills become obsolete, while others become more valuable, and still other newly emergent skills become revealed necessities. These combined influences of global migration, computerization and automation directly impacts employer skill demand in the labor market. The speed with which these influences change over time, impacts the speed employer's demands must change to keep pace. As the pace of change increases, skill relevancy as defined by employer needs also changes. This requires identification of relevant skill, as well as rapid adaptation of skill attainment methods and processes.

The majority of high school graduates are, by virtue of their age, prospective entrants into the labor market. It is important for graduates to understand the needs of the labor market in terms of the skills employer's desire versus the skills they possess. The high school graduate's desired occupation of employment determines to a great extent those skills required and each individual must understand the alternatives available to acquire those skills. Post-secondary education exists by design to offer training needs of employers and desires of students. Post-

secondary education may be considered as *the* essential operative for labor readiness against a dynamic economic backdrop.

1.1 Historical Context

The economic justification for post-secondary education has an established foundation in the Morrill Act of 1862 that created land grant institutions as a means to educate individuals in subjects relating to agriculture and the “mechanical arts”. Although one might surmise the general intent 150 years ago focused on workforce development in the face of the Industrial Revolution, there appeared to be an underlying motive at work.

The act was initially proposed in 1857, passed in 1859 and vetoed by the then President Buchanan (APLU 2012). Once the bill was rewritten and included “military tactics” in the curriculum, President Lincoln promptly signed the bill in 1862, one year into the Civil War. This background requires one to consider the origins of the role of government in regards to the determination of both access and content of post-secondary education for the population at large.

Today post-secondary education is not only comprised of land grant universities, but is a collection of multiple institutional configurations that could well be either a state run or private institution. Although the institutions have various organizational structures, the system overall is governed by an accreditation body that validates methods and programs to a minimum standard. Each school however, attempts to achieve differentiation in various ways, for instance by developing dominance in a particular discipline, or sport, or location. For the most part public colleges, universities and technical colleges are operated by individual state governments and are the product of state goals and policies. The federal government has as its main interest the military academies that reside under their governance.

Yet, how active of a role the government should play in determination of post-secondary education is a matter of some debate. Zoellner (2012) claims the government has a two-fold role, one focused on security and the other reflective of the “emergence of economic government.” Others believe there is not a role for government in the sphere of educations as it dilutes the free market solution connected with the goal of human capital investment. (Friedman 1979). The economic landscape is constantly shifting and with it the demands for labor. We already stand *beyond* the threshold of the digital revolution and are yet unsure of the response needed to enhance the skill of the workforce to meet the demands of today’s (and tomorrow’s) employers. Will the university system respond and will the consumer (student) recognize the return on investment as a result of participation?

1.2 Importance of Topic and Contemporary Indicators

Our country is currently experiencing what is being referred to as a “jobless recovery” from the Great Recession of 2007-2009. The main macroeconomic growth indicator, GDP, is solidly back into the positive range in terms of quarter over quarter percentage change. Meanwhile unemployment rates have fallen from recession highs of 10% down to at or below 4.0% (BLS) for over ten (10) months. This unemployment rate is an entire percentage point below unemployment levels of 5% *prior* to the recession’s onset in 2007 Q4. On the surface, such macroeconomic statistics should make us euphoric and very optimistic, yet we are weirdly unsatisfied. Another macroeconomic variable is creeping into the public discourse: the employment to population ratio. (Jaimovich & Siu, 2014) Because this ratio is thought to be reflective of the economy’s capacity to accommodate labor entrants due to population growth as well as provide insight to demographic changes, its behavior can signal an undercurrent of concern in the face of seemingly healthy indicators.

For example, in 2007 the year of the Great Recession the BLS reported the number of civilians employed at 146,000, unemployment at 4.6% and employment to population ratio at 63%. During the recession the number of jobs went below 146,000 and stayed below that number until 2014, while the recession was deemed over by accepted macroeconomic definitions by 2009 Q2. Hence the idea that although the country has been in recovery, the total number of jobs is lower than needed, while unemployment continued to persist in 2014 at over 6%, and the employment to population ratio had fallen to 59%.

In the past, the assumption regarding the lag between economic recovery and employer labor recall has been focused on productivity gains by employers, which eventually translate into incremental reductions in the aggregate amount of labor required to perform work. Today these discussions have taken on a new complexion. Technological advances are thought to have spawned automation and robotics that are taking the place of human labor, in particular relating to “routine” jobs. This outcome of this development is fueling the concept of “job polarization” within the labor market. (Frey & Osborne, 2017, Jaimovich & Siu, 2014)

Job Polarization described as a sort of “hollowing out” or obsolescence of job occupations that exist in the middle of the job spectrum. Those jobs of a routine manual nature anchored on the lower end and those jobs of a non-routine and “cognitive” nature at the higher end. (Frey & Osborne, 2017) As table 1 shows below, even at historically low unemployment rates, participation rates and employment to population ratios along with the polarization effect provide signals that labor market may be shifting. Although this data might lead one to believe there is indeed a jobless recovery, there are also indications that employers are facing a labor shortage; that is a lack of labor with the skills that prospective employers require.

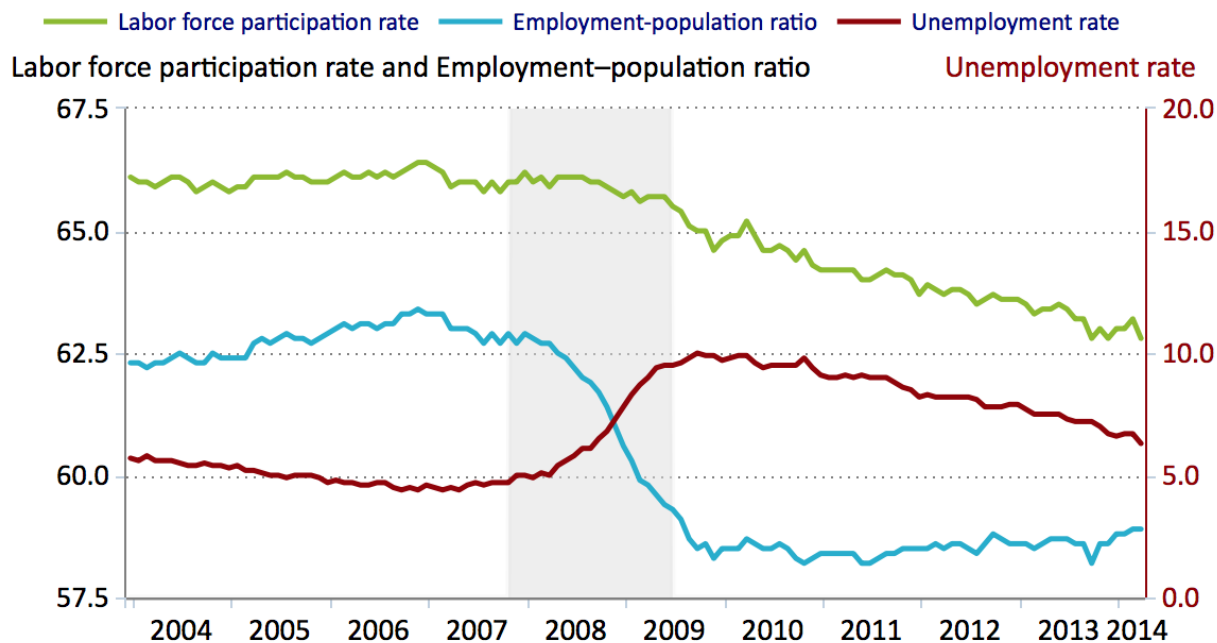
These seemingly inconsistent circumstances require understanding of both the micro and macro labor market germane to successful entry and participation, and ongoing viability. This is not a unilateral concern; it is a concern for all the stakeholders involved.

For the student as a prospective entrant into the labor market it matters more than ever that the return to an investment of post-secondary education be understood. The polarization effect makes occupational considerations even more important today than ever before.

Employers are interested in skills never before imagined, pertaining to big data analytics, machine learning, block chain transactions and virtual reality.

The government has a choice, just as in the days of post WWII industrial change, to either embrace innovation and redesign of industry methods and technology, or we can get stuck in the methods of the past using policy to protect the already hollowed out job occupations. As a stakeholder the government has a vested interest in enticing the current and prospect labor market participants to understand and anticipate employer needs on the high end of the polarized spectrum, and for employers to adequately signal (via job descriptions) and communicate those needs to the post-secondary institutions so skill needs get met.

Labor force participation rate, employment–population ratio, and unemployment rate, seasonally adjusted, January 2004–April 2014



Note: Shaded area represents recession as determined by the National Bureau of Economic Research (NBER).

Click legend items to change data display. Hover over chart to view data.

Source: U.S. Bureau of Labor Statistics.

Figure 1: Labor Force Participation

Source: Bureau of Labor Statistics ([Participation, Employment-Population Ratio](#))

1.3 Research Question

Given the historical context of the evolution of post secondary educational institutions originating with the Morrill Act of 1862 for the purpose of educating the populace in subjects relating to agriculture and the “mechanical arts”, the institutions have demonstrated a legacy of adapting educational topics to perceived social and economic priorities prevalent at the time. In a developing economy such as the United States of the early, mid and even late 1900’s, the speed with which this evolution took place appeared to proceed at the pace dictated by the labor market.

There can be no denial that the nature of the US economy today is dramatically different from that of the 20th century. Our economy is more complex and sophisticated driven by ever changing technology. In this dynamic environment, human capital as an important economic actor must also keep pace with the ever-changing labor market demand for complex and sophisticated skills.

This paper examines the traditional approach to human capital skill development via post secondary education and training and evaluates the cost - benefit proposition in today's environment. Each key stakeholder of this method of human capital skill development will be considered: the employer, the individual and the government.

Key to this understanding will be an attempt to determine if the training and skill needs in the ever changing, complex and sophisticated economy we now find ourselves in are sufficiently achieved through the traditional post-secondary institutions.

In order to understand the employer stakeholder perspective this paper will use qualitative means to discover how specific skills needed by business are defined and achieved, and to what extent this skill development depends on a post-secondary education. In the process of this discovery any discernable benefits resulting from alliances or collaborative agreements created between employer and educational institution will be noted and detailed.

In addition, the cost benefit relationship for the individual and government will be examined to understand if the benefits from this pursuit has increased or eroded over time.

In sum the research question of this paper has three discrete components relative to the investment and returns to attainment of post-secondary education:

Are returns to post-secondary education great enough to incent high school graduates to continue education; to incent collaborative agreements between business and educational

institutions; and to incent government policy makers to advance proactive strategies promoting attendance?

Each component will be examined individually in what will be termed “stages” in order to piece together a complete view of decision points, processes and outcomes leading to a full understanding of investment and returns to attaining post-secondary education in the early 21st century.

II CHAPTER 2 - LITERATURE REVIEW

Setting aside the discussion relevant to curriculum content of post-secondary education in its many forms, and proceeding on the assumption that the curriculum of most institutions provides an individual with relevant marketable knowledge and skills in general, one would predict it is in an individual's self interest to make an investment in their own knowledge via the pursuit education beyond high school.

Two main streams of thought emerge in the literature regarding post-secondary education in general, one stream economic and the other sociological. First, the stated mission of higher education to teach skills with the intent of making the individual employable and able to earn an income describes the economic argument for advanced education. Secondly, and less overtly expressed, the sociological aspects of attending post-secondary schooling can be studied as a less tangible outcome involving status, but no less material.

II.1 Theoretical Framing: The Economic Argument

Macroeconomic theory commonly categorize the main factors of production as: Land, Labor and Capital. (Samuelson, 1989) These are broad categories of inputs to productive capacity, or the engine that drives output in the form of goods and services produced. All three factors of production are crucial for success. From an individual state perspective, each state has a discrete and definitive set of natural resources (Land) within its state boundaries. Flow of money (Capital) is mostly uninhibited between states, although state policies can entice capital inflows with tax and economic development incentives. Labor however, is not a controlled resource by the state, and is at the same time unique to each state. Each state is comprised of a unique demographic and skill profile. Yet labor is such a key factor of production, that one would surmise that a more skilled labor pool would lead to higher paying jobs, which would lead

to further economic activity in the form of a multiplier effect. For this reason, state government is motivated to have an impact on the composition of the labor pool as it relates to the attraction of productive capacity that would enhance overall productive output in the state.

The dominant thinking within the field of labor economics as it relates to labor supply, specifically skilled versus non-skilled supply to meet market demands, is defined by contributions in the field by Gary Becker (1964). Although Jacob Mincer was a forerunner, it was Gary Becker that put theory and name to the emergent topic, which he labeled *human capital theory*.

Although Becker offers the theoretical framework surrounding the decision to attend post-secondary college, several studies have sought to quantify the impact advanced education has on individual earnings. This work has produced some mixed signals, however nearly all research has agreed to the existence of the fundamental correlation between advanced post-secondary education and increased earnings. Studies have not been found that offer conclusive evidence regarding causal links between these conditions.

II.2 What is human capital theory?

Becker in his theory utilized mainly microeconomic principles to predict conditions that motivate an individual or firm to pursue additional knowledge and skills (human capital investment). The approach is based on a cost - benefit analysis that is a recognized staple when applied to other investment decisions, say determinants of investments in physical goods or land improvements. The decision is made based on the expected returns after all costs (including opportunity costs) are adequately considered and matched to predicted yields or returns on the investment, against a backdrop of both known or unknown risk. This general process is central to the conceptual framing of investment decisions irrespective of the application and is therefore

the conceptual framework independent of our area of concern. This notion is nearly identical to the theoretical precept of “economic man” as conceived by Simon (1955) as applied to individual decision-making. In this instance all outcomes, risks, probabilities and preferences are known prior to making the final decision. Derivatives of this theory have appeared given the unrealistic nature of knowing outcomes and probabilities of all possible alternatives. Variants of “economic man” theory have embraced conceptions of preferences and bias that are unique to individuals. Such bias is relevant to this study as it relates to one student’s preferences, for example: to pursue information technology versus nursing as an occupation.

II.3 How does it work?

What motivates an individual to take steps to increase their skill level? Becker outlines the decision-making process of the individual in terms of expected marginal costs and expected marginal benefits, in particular as applied to education decisions. Becker’s theory rests on the foundation of “maximizing behavior” by the individual as the basic assumption underlying general economic theory. (Becker, 2001) Becker explains that the individual acts to maximize their own value economically, therefore, expected benefits from post-secondary education should drive the decision of the labor pool to accept associated costs.

It is fortunate that Becker in his original work focused much of his attention to the application of human capital theory in the area of education. Although, his attention to formal education was not exclusive as he also considered investment in job specific training and associated returns. He recognized education to be general training in nature, with the intent to prepare labor for general problem-solving techniques. He readily acknowledged that comparisons should be made between six years of on the job training and the associated performance productivity versus six years of post-secondary school and the resultant

productivity, especially in “technologically advanced economies” if the data could be obtained to do so. (Becker 1964) However, he considered such a comparison a point in time approach. Such a comparison would also need to incorporate the ability for labors future mobility with exclusive job specific training. Mobility would be constricted to only those firms valuing such specific skills. Although Becker addressed cost-benefits associated with job specific training, he spent the majority of his empirical research on formal education with the intent to generalize the principles embodied in his theory.

II.4 Why does it work?

Each individual must make his or her own personal decision as to the value of post-secondary education. That decision will be based on a multitude of factors, most of which one can categorize as either a cost or a benefit. To the extent one can quantify the costs and benefits, one can view education as a consumptive good providing utility to the consumer (student) in the classic sense. To the extent intrinsic costs or benefits accrue (time away from family, being first in family with a degree), the quantitative notion of cost and benefit breaks down somewhat, although even these can be valued on an individual basis as either a cost or benefit worth the investment, weighted against known quantifiable costs in terms of lost earning opportunity in the present or the outlay of funds for tuition. Becker’s theory on human capital works to the extent that these micro economic principles regarding financing and utility have stood the test of time. The question remains if these relationships stay true in magnitude as the economic landscape and demands by employers of the labor force shift over time.

Although Becker lead the way by laying the foundational elements of human capital theory and specifically it’s application in the area of education, a compelling counter argument

regarding the value of education emerged in the sociology area that directly confronted Becker's assumptions on the very purpose of education.

II.5 Theoretical Framing: The Sociological Argument

Persuasive arguments regarding both the positive and negative social impact of attending school is presented by Bowles and Gintis (1976, 2002). These authors offered the theory that school has little impact on skill development, rather the real take away for the student is an understanding of the "social order" they can expect in the business world. Bowles and Gintis name this the "Correspondence Principle", where "social interactions" determine success. The reward, penalty structure is also established for the student to follow and adhere to going forward.

Bowles and Gintis posit that personality matters in earnings potential more than skills obtained through education. In particular, they believe the Big 5 personality traits are key, however Conscientiousness is the dominant predictor of future success. If we interpret Conscientiousness by another name, say, "work ethic" (Bell 2014), this concept begins to resonate within the research to date. Several studies, (Bell, 2014), (Bowles & Gintis, 2002) surveyed human resource representatives and hiring supervisors to inquire which skills they deemed necessary for success. A formal discipline, such as engineering was not a common answer from the respondents, rather attitude, taking the form of work ethic was named.

Mullin (2011) disagreed with Bowles and Gintis regarding the relative importance of schooling. Her study and calculations concluded, "...investments in higher education at the state level were the most significant predictor of income, followed by highway spending." Mullin performed additional analysis via longitudinal studies, which indicate that investment in human capital had a greater impact between 1990-2000 than for the 30 years prior (1960-1990).

Schudde & Goldrick (2015) track closely with the opinions and conclusions of Bowles & Gintis (2002) as they relate to the social impact of education. These authors introduce the concepts of “culture capital” and “social capital”, where cultural capital is associated with a feeling of “belonging” by the individual, and social capital refers to “mutual acquaintance and recognition”. Both concepts reinforce the Bowles and Gintis position of “socialization” as a process reinforced in school. Schudde and Goldrick pursue the topic of stratification that develops as a result of the existence and perceived distinctions of the community college. They claim community colleges carry a stigma, that those attending lack something and receive a lesser quality of post-secondary education. Bowles & Gintis are adamant that the existence of community colleges are used to preserve the elitist status attached to 4 year institutions. Schudde and Goldrick (2015) claim the stratification that gives rise from community colleges furnishes the illusion of equal access, but in reality propagates inequalities that currently exist in various socio economic classes.

Becker (2001) recognized that inequalities exist that extends to problems with distribution of earnings. He quantified these inequalities and calculated separate correlation coefficients for the “south” and the “non south”. He concluded the discrepancies he found, indicating disproportionate lack of impact from human capital investment in the south, were the result of lack of opportunity (or supply). Becker proposed how free college would impact his supply curve and decision for human capital investment. He concluded, free college would remedy access to the extent “equality of opportunity would imply not equal investment but equal opportunity to invest, the actual amount depending on ability and other personal characteristics.”

II.6 Contemporary Literature Review

Most contemporary literature is generally matter of fact regarding the earnings advantage realized by individuals who attend post secondary education. Pew's 2014 research results indicate earnings premium in excess of 50 - 60% for those who attain a 4 year degree over those who only have a high school diploma (PEW 2014) . This data agrees with the Bureau of Labor who also reported a 50% premium based on 2016 survey data (BLS 2016). Both studies indicate a 4 year degree carries a much greater advantage than a 2 year degree. Where a two year college degree might get one 7% higher than a high school, a 4 year degree gains an advantage of a whopping 50%+. Pew Research concludes this relationship has persisted over time and if anything the gap has widened for the students of today, making the case for college all the more compelling. Although these results are "typical", other studies have attempted to understand nuances of these premiums by grouping earnings by occupation as well as stratification of results by number of years of education (Carnevale et. al, 2011).

Aside from the earnings premium commonly associated with attendance to post-secondary education, there are other aspects that have been studied relative to college attendance that revolve around job satisfaction, unemployment rates and underemployment. These issues have generated other studies of labor market characteristics connected to college attendance, namely, earnings inequality and job polarization.

Given the positive outcomes associated with attending post-secondary education, it has become increasingly important to increase access to college by students that have a desire to attend college. This has spawned multiple "Promise" programs sponsored by both private (Kalamazoo), and public (Tennessee) institutions. The Promise programs are designed to provide free educational opportunities to those high school graduates who qualify. Indeed the issue of

college access is the cornerstone of some viewpoints that regard college attainment as a gateway to entry into the middle class by those disadvantaged by poverty.

College in and of itself however is not the unilateral solution to some of these social considerations that have entered the forum of discussion. Someone attaining a four year college degree will only earn more if employers are willing to pay more. For that to happen employers must perceive a higher value attached to that individual in the form of a desired skill that is needed by the firm. It is at this intersection point where the dynamic business environment influences the needs of the firm. The jobs of yesterday are no longer the jobs of today, nor are the skills required to perform the jobs of today the same of the past. For this reason, job descriptions, job requirements and performance criteria evolve as a moving target.

Because there are necessary interdependencies and interactions that accomplish the labor market equilibrium, understanding the returns to a college education requires a holistic view of the landscape via the three part stakeholder analysis.

II.7 Modeling a Stakeholder Analysis

There will be a three-pronged approach to the cost-benefit analysis by stakeholder of post secondary education. Each approach will be characterized as a separate stage in the overall analysis. Each stakeholder will require a separate model to appreciate the cost – benefit relationship to post-secondary education.

II.7.1 *Stage 1: The Student Stakeholder Model*

Aside from characterizing the decision as to whether to pursue post-secondary education as an economic choice, it is also clearly a very personal choice. After all, it is at this juncture that one begins to formulate initial career choices that will, if not immediately, will eventually impact

work life; including work day, work environment, geographic location, as well as earnings for years to come.

So for many, the precursor to choosing the path to post-secondary education is career choice. If not a specific occupational choice, a general sense of the desired curriculum based on level of interest in the subject, or degree of affinity based on past experience (ex. I am good at math). The Internet is rife with advice that relates to how to choose a career. At the web site: [Careers Advice for Parents.org](http://CareersAdviceforParents.org) guidance is given to parents in an effort to engage them as active participants in career planning for their children. At the site:

[Career One Stop.org](http://CareerOneStop.org) a comprehensive view of possibilities is offered by the US Department of Labor, (DOL). Both web sites endorse a general three-step approach to career selection: 1. Introspection 2. Discovery 3. Planning.

Although the *introspection* phase involves taking an inventory of one's natural skills, abilities and interests, during the *discovery* phase searching to understand professions and job availability enter the picture. This of course is for the purposes of becoming aware of available professions, possible employment opportunities, projections on growth or decline of said job opportunities, and projected earnings associated with them. It is during this phase that training requirements for various professions begins to emerge. In the *planning* phase one begins to map the process to achieve through education or job training the necessary skills to pursue the profession one has selected.

Recognizing there exists a myriad of intangible elements that still have powerful influences on this decision, say for instance approval by parents and/or peer groups, our focus will remain on the economic and quantitative component of this decision.

In its simplest form the decision-making model for the student is depicted in Fig.2.

A high school graduate armed with information regarding their desired career path, now must face the realities of what it takes to pursue that occupation. A myriad of questions emerge. Can they afford to obtain the training required to pursue their chosen occupation? Will the net benefits result as anticipated? Will employment be available, and can they earn a living performing the kind of work they wish to pursue? Are the costs both personal and financial worth it to the student? Are there alternatives that are just as acceptable without the personal and financial cost? Ultimately the student must come to a conclusion regarding these questions by way of the cost / benefit analysis.

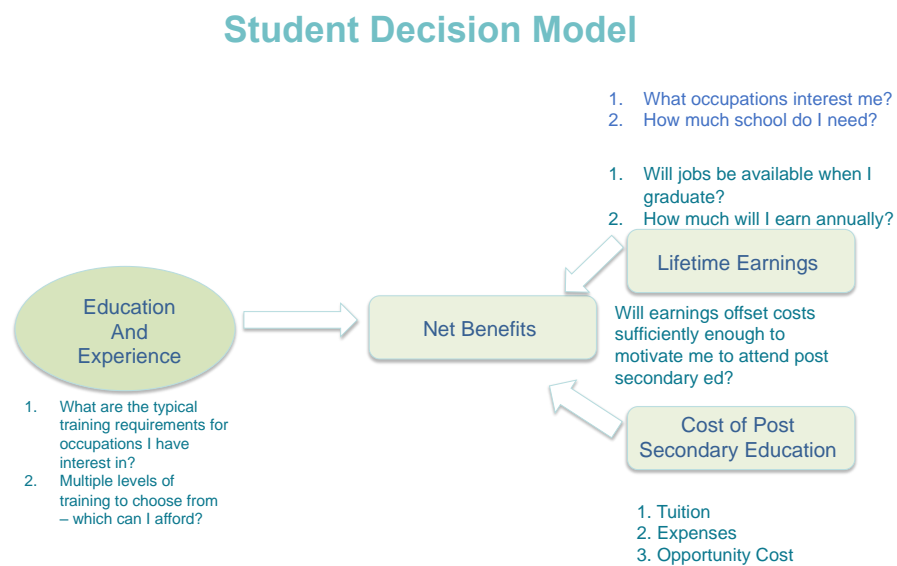


Figure 2: Student Decision Model

Naturally a strong reliance of expected lifetime earnings by occupation to answer these questions is likely. Focusing on lifetime earnings however at the exclusion of costs associated with attending post-secondary school is an incomplete consideration of the economic proposal as

Becker has pointed out. It is but a single dimension in the decision process when considering post-secondary education.

This paper will include consideration of the “net benefit” associated with attending post-secondary education. Net benefits will be comprised of two major components. The first component being lifetime earnings, and the second component are the costs associated with attaining the post-secondary education. The lifetime earnings minus the costs provide us the “net” benefit of attaining post-secondary education.

II.7.2 *Stage 2: The Employer Stakeholder Model*

What kid doesn’t aspire to be Labron James or perhaps Angelina Jolie or Beyonce’? Or imagine being Serena Williams in command of the tennis court, or Michael Phelps owning the swimming pool, having all the fame, fortune, the glamour and success that goes along with these careers.

But Verizon wants young kids to know there are only 2880 pro football players, only 5800 models, 850 pro soccer players and 624 pro basketball players. Their television commercial and accompanying web site <https://www.weneedmore.com> wants kids to know there are over “4 million jobs in science and tech”. Comments on the y-tube version of this hash tag site blast Verizon for their efforts to dash the dreams of young ones wishing to become the next Lebron. But what is it that Verizon is trying to accomplish? They are attempting to underscore the need for aspirations in other fields where jobs exist and no one is there with the right skills to fill them.

In a market economy such as ours, firms exist to marshal the factors of production to fulfill demand. In America our markets are typically characterized by competition, and competition breeds innovation. The greatest profit available generally accrues to the entity that

arrives first on the scene with successful innovation, so there is intense pressure and motivation to arrive first in the market. Thus speed, adaptability, flexibility are all-important attributes for the firm. The nature of today's marketplace is dynamic and ever changing. The firm's survival is so dependent on these attributes that they take on Darwinian importance to the firm's evolution and very survival. The past is littered with firms that either ignored signs of a changing market or were not able to adapt readily to changes; firms such as Kodak, Blockbuster, Borders are just a few remnants of recent history.

So competition is intense and to stay in the market or preferably ahead of the market, innovation is only one significant aspect to possess. Competent labor to conduct the firm business can be a key point of differentiation for a company among its competitors. Consider Apple Inc. a dominant firm in the consumer electronics market. The innovative reputation of this firm could only be accomplished by labor skilled to perform all the functions required to carry out the innovative vision of its most celebrated executive and founder Steve Jobs. All the necessary steps to convert his innovative vision into a tangible product required a myriad of labor with skills aligned in accordance with their designated assignment to carry out the mission. Steve Jobs knew the importance of his workforce, in fact he took extreme and questionable measures to prevent his workforce from leaving the company to go to competitors. As an employer he was well aware of the value and competitive advantage his workforce represented for his firm.

Sadly, Steve Jobs has deceased, however the pressures remain to continue his innovative legacy. Competitors remain at the heels of Apple and the firm's past success is just that, past success. Their future visions and execution of these visions will determine if they remain

dominant or become one of the historical remnants of our past. I submit that their destiny will be determined to a large extent by the talent of their workforce.

So how is it that employers seek out labor with the skills they require to produce the goods and services they bring to an ever-changing, intensely competitive, and yes global marketplace? Labor economics would indicate to us that those skills most valued in the marketplace would exhibit the highest demand among employers and therefore realize a relatively high wage reflective of that demand. The wage would be not only based on the economic value to the firm, but also a wage-based availability of the desired skills within the labor pool or reflective of the equilibrium point between the availability of the labor (supply) and the jobs available for that skill (demand). At the juncture of this intersection wage should be determined.

We now turn our attention to the sort of skills predominately in demand and seek to discover if post-secondary education trains students in acquisition of these desired skills. Put another way, do colleges train students in the skills that employers need? What strategies might employers pursue to influence post-secondary education institutions in their curriculums so as to create a labor pool that reflects the skills employers anticipate they will need. How is it that Verizon feels the need to reach out to kids to entice them into new areas of potential interest.

To engage with the labor market, employers utilize standard language to communicate their needs. This typically takes the form of a job title and a job description. Their method of recruitment includes a description of skills necessary to be successful in the job.

Most employers view job skills as falling into one of two categories, those that are job specific, for example finance and accounting skills, and are typically considered “technical”, and those skills that are general, non-job specific, for example problem solving or the ability to

effectively work in teams. These skills are typically referred to as “soft skills” or “people skills”. As Becker versus Bowles positions their respective arguments, skills can be actions or behaviors, simply said *what* (technical) you do and *how* (behavioral) you do it.

A job description is a specific instrument used in the firm to define employer positions that exist. It serves several purposes both internal and external to the firm. From an internal standpoint, the hiring manager creates a job description to formalize the job requirement and uses it as a vehicle to communicate to other constituents within the firm, namely the Human Resources group or authorizing agency as the organizational hierarchy dictates. In this way a position is clearly defined and justified in terms of job task and contribution to the firm. From an external standpoint, the job description is utilized to communicate to the outside labor market the nature of the employment opportunity at the firm. The overall objective is matching. Matching the most qualified labor candidates to the employer demand in the most efficient way possible.

To achieve the greatest efficiency, the closer the matching that occurs, the more efficient and higher probability for immediate success. Managers many times ask for candidates that can “hit the ground running”. This of course, means the finding and selecting the candidate that aside from cultural indoctrination needs little formal training and is ready out of the gate to begin productive contributions to the firm.

Both the internal and external entities benefit from the most comprehensive and specific job description that can be created.

The standardized approach to job descriptions include key categories such as: Job Title, Job Description, Job Responsibilities (deliverable or success criteria), Required Knowledge Skills and Abilities (KSA's), Required or Preferred Education. Other important designations are

also included regarding job descriptors about travel expectations, reporting structure and supervisory requirements. (SHRM/ACT: Job Analysis Activities.)

This matching function is so important to labor markets that a clearinghouse of sorts was created during the Great Depression of the 1930's, where the government assisted unemployed labor in discovering employment opportunities by way of what are today called employment agencies. In the process of this matching activity, the Department of Labor developed and used as it's backbone a Dictionary of Titles (DOT). In this dictionary for a specific job title, say Mechanical Engineer and a definition of this position is given along with specifics regarding: tasks, Knowledge, skills, abilities, work activities, work context, interests and work values are all categories that are defined as they relate to the position Mechanical Engineer. To appreciate the depth with which such an endeavor exists, a full seventeen pages is dedicated to the job description of a Mechanical Engineer. Table 1 below illustrates the first item listed under each descriptor.

Table 1: Occupation /Job Description

	Job Title	Mechanical Engineer
DOT Code	Description Category	
22135		
	Definition	Perform engineering duties in planning and designing tools, engines, machines, and other mechanically functioning equipment. Oversee installation, operation, maintenance, and repair of such equipment as centralized heat, gas, water, and steam systems.
	Tasks (1 of 17)	Designs products and systems to meet process requirements, applying knowledge of engineering principles.
		93 Engineering and Technology
	Knowledge (highest of 32 elements)	Knowledge of equipment, tools, mechanical devices, and their uses to produce motion, light, power, technology, and other applications
	Skills (ranked highest of 46 elements)	91 Mathematics Using mathematics to solve problems
	Abilities (ranked highest of 52 elements)	88 Mathematical Reasoning The ability to understand and organize a problem and then to select a mathematical method or formula to solve the problem
		89 Drafting and Specifying Technical Devices
	Work Activities (ranked highest of 42 elements)	Providing documentation, detailed instructions, drawings, or specifications to inform others about how devices, parts, equipment, or structures are to be fabricated, constructed, assembled, modified, maintained, or used.

	Work Context (56 elements defined)	90 (I) Importance of Being Exact or Accurate How important is being very exact or highly accurate in performing this job?
		94 Realistic
	Interests (highest of 6 elements)	Realistic occupations frequently involve work activities that include practical, hands-on problems and solutions. They often deal with plants, animals, and real-world materials like wood, tools, and machinery. Many of the occupations require working outside, and do not involve a lot of paperwork or working closely with others.
	Work Values (ranked highest of 27 elements)	83 Independence-Mean Extent Occupations that satisfy this work value allow employs to work on their own and make decisions. Corresponding needs are Creativity, Responsibility and Autonomy.

As times change so too have job descriptions. The Dictionary of Titles has been an evolving work as a result of the changing employer demands. The DOT is now extinct and has been replaced by a web-based version O*Net. The two systems have been married with “crosswalks”, for over ten years, with O*Net is designed to be more fluid and able to adapt more quickly with the labor markets changing needs.

So although classifications KSA seem to remain the same, job titles and definitions have changed dramatically since the late 1930’s. For instance not only would a Mechanical Engineer be required to use CAD systems, which were not inexistence in the late 1930’s, but it’s likely that a job title of Solar Technology Technician did not exist. Indeed, as an indicator of the dramatic change in the nature of the labor market, nearly a quarter of job occupations reported by those employed in 2003 did not exist nor match with the Census job code index as it existed in the late 1960’s.(Council of Economic Advisors 2009).

As an example of the difficulty with maintaining such a data base for our entire nation across all job titles, if the job category of “Machine Learning” is placed in the O*Net search engine, ten pages of possible jobs are provided comprised of job titles such as: “Calibration and Instrumentation Technician”, “Packaging and Filling Machine Operators”, “Machine Builders and Other Precision Machine Assemblers”, and “Taxidermist”. In contrast, at the LinkedIn professional networking web site, placing “Machine Learning” into their search engine results in multiple job titles such as: “Machine Learning Engineer”, described as a position related to “data analysis”, “data mining”, “newest technologies” and references to “artificial intelligence”. The disparity of results underscores the intense challenge for our institutions to stay on top of the latest employer needs and adequately depict them so as to accurately reflect employer needs and achieve the “matching” objective in the labor markets

These challenges are some of the motivation behind what the authors Autor, Levy and Murnane (2001) devised as a classification scheme less dependent on specific knowledge, skills and abilities (KSA) and instead a more generalized classification of the very same attributes (KSA) of jobs. They created their scheme based on the physical demands of a particular position combined with the cognitive demands of that position. In particular, if the physical demands are routine or non-routine in nature and if the cognitive skills required are analytic or interactive in nature. The number of classifications is five in total:

- Routine Manual
- Non-Routine Manual
- Routine Cognitive
- Non-Routine Interactive
- Non-Routine Analytic

This classification strategy is a valuable way to understand characteristics of jobs and the necessary skills required without the burden of understanding all the nuances between say between a Mechanical Engineer and a Mechanical Engineer Technician. Understanding that one position is non-routine and analytic in nature versus the other which is routine and cognitive allows us to discover if these skills can be acquired with or without post-secondary education, and if they are valuable to the extent to create meaningful differences in lifetime earnings.

Figure 3 below depicts the incorporation of this classification system into the way in which the labor market, both employee and employer can understand the level of lifetime earnings associated with post-secondary education levels.

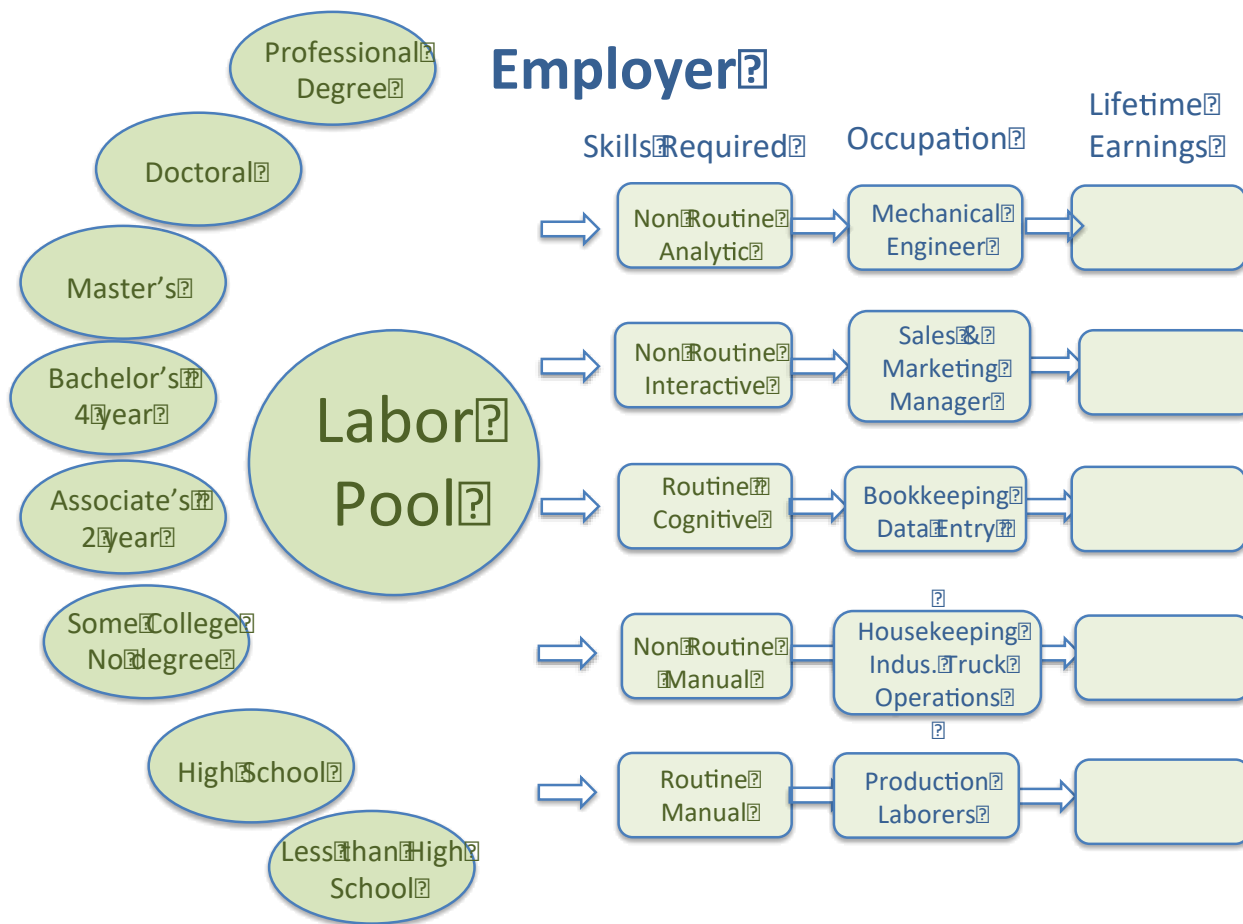


Figure 3: Labor Pool Supply and Demand using Autor et. al, Skill Category Designations**II.7.3 Stage 3: The Government Stakeholder Model**

Does the federal government have a stake in desiring the general population to pursue post-secondary education? What is in it for them?

The stated goals of our country's constitution "to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defense, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity", comes with a price. The principles that we value as a nation can only be realized if a portion of the citizenry are dedicated to providing the services needed to ensure these goals are met. To do that it is necessary that our country becomes a business.

We pay our public servants and we expend based on programs we deem as a nation to be valuable, whether it be spending on defense, spending on Medicare or spending to subsidize farmers. Revenues collected from taxes offset spending by the government. Any shortfalls between revenues collected and expenditures are calculated as budget deficits and are financed by the Treasury arm of our government.

There is general agreement that the government wishes to conduct business with the lowest level of deficits possible over the long run. For this reason, debates often ensue when expenditures and tax revenues get out of balance for extended periods of time. Unless taxes increase revenues, deficits will continue to rise, and the effect of debt servicing further debt threatens. Both tax revenue and federal expenditures are important policy components of our governmental and political machine.

The federal government becomes a stakeholder in college education to the extent that tax revenue increases as earnings increase. If college education has a positive impact on lifetime earnings, the government would accrue higher tax revenue. To appreciate the impact and

magnitude of this convergence the prior models for student and employer are combined and adjusted to extrapolate the macroeconomic impact that would be expected from an educated workforce employed in occupations that justify the post-secondary education expense. This information would then inform regarding possible policy direction that would encourage more participation in these very occupations.

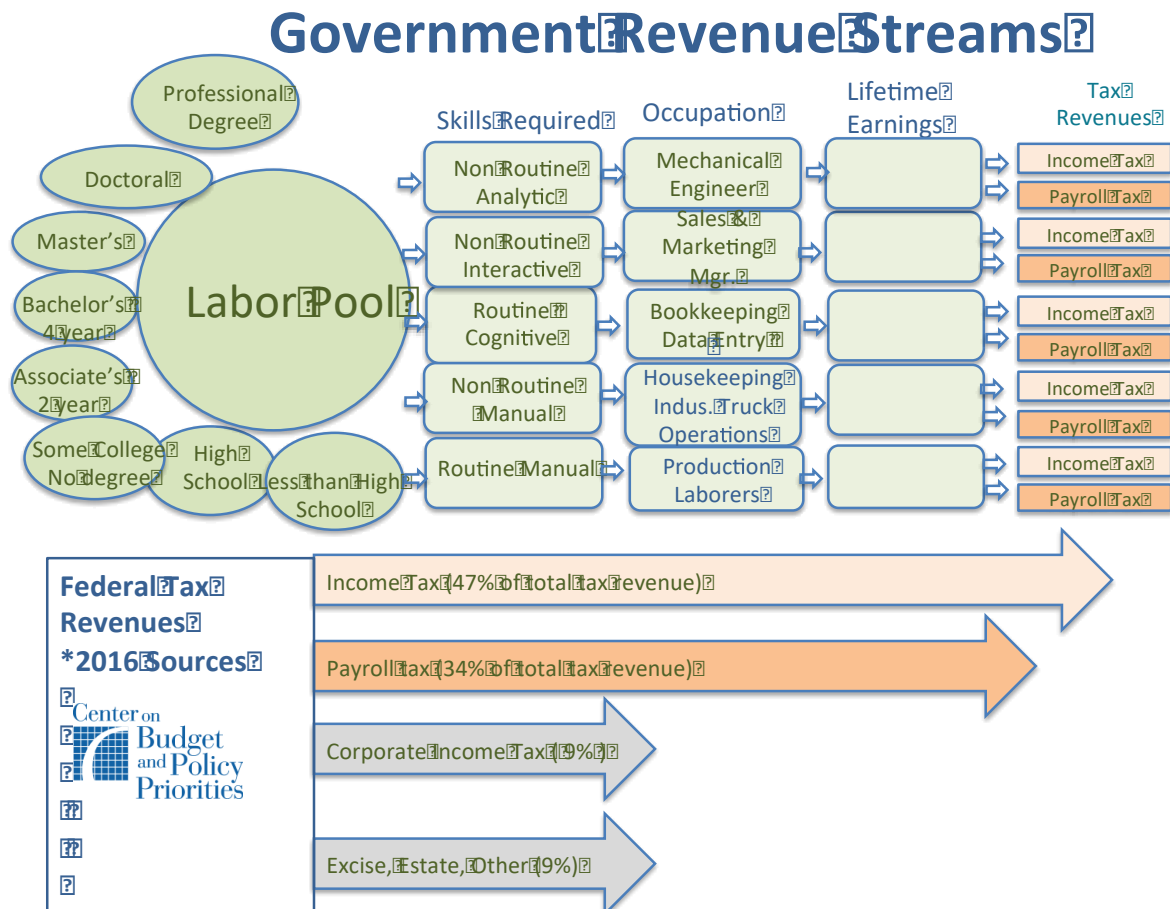


Figure 4: Federal Government Revenue Streams

III CHAPTER 3 – RESEARCH METHOD, ANALYSIS & RESULTS

The three-pronged approach described in the previous section dictates differing methods to discover and interpret the cost benefit analysis that has been proposed. A distinctive research method for each stakeholder analysis aligned with the stages set forth above will be outlined.

III.1 Stage 1: The Student Stakeholder Method, Analysis & Results

As earlier noted, faced with choosing an occupation, the student must consider that amount of education that must be obtained in order to realize the expected net benefits associated with that occupation.

Key to this thought process is understanding both the expected lifetime earnings as well as the true costs associated with obtaining the necessary education. One might wonder if these were the only considerations, why wouldn't all high school students enroll to become say, Doctor of Medicine, given the economic returns justify that investment yielding the nearly the highest level of returns across all occupations. And although we would not expect to see all students become doctors, using a purely "economic man" perspective we would expect a convergence toward positive and high end net benefits in alignment with individual occupational preferences and job availability.

For a clear view of the relationship between education and net benefits we must consider two variants on the simplified relationship. First, the type of post-secondary education (e.g. university, 4 year or vocational college, 2 year) as well as the amount of education in duration (e.g. bachelor's degree 4 year, some college no graduation). Secondly, the occupation one selects to enter, also impacts net benefits in a substantial manner. Consider Table 2 as an illustration of a hypothetical example of alternatives open to two Students: Student A, and Student B. and an illustration of possible lifetime earning outcomes based on occupational selection.

Let's say we have both students are willing to obtain a 4-year Bachelor's degree. Student A wishes to pursue History as a major and Student B wishes to pursue Engineering as a major. Both will realize the same cost of education; however, the resultant net benefits could be dramatically different.

The Department of Labor (DOL) provides prospective students with a plethora of data organized in a very accessible fashion. According to their web site: [Careers One Stop.org](http://CareersOneStop.org), Student A who studies history, could select from occupations as diverse as Tour Guide & Escort to Curator. As a Tour Guide in Orlando Florida, someone could expect a median salary of \$25,390 (salary range: min \$20,300 / max \$ 37,220) and as a Curator again in Orlando, FL someone could expect a median salary of \$47,380 (salary range: min \$31,730 and max \$80,340).

From an education perspective, of those who are currently Tour Guides (across the US) only 25% have at least a 4-year bachelor's degree, another 12% have over a bachelor's level of post-secondary education, for a total of 37% having a bachelor's degree or above. In contrast, those currently in the occupation as Curator in the US, 49% have at least a bachelor's degree and another 35% have a master's degree or greater, for a total of 85% having a bachelor's degree of higher. So a history major obtained via a 4-year bachelor's degree can have vastly different outcomes based on occupational selection and job availability.

Let's now examine the occupational alternatives available to Student B who desires Engineering as an area of interest. Student B could also select from a multitude of occupations ranging from Mechanical Engineer Technician to Mechanical Engineer.

The DOL reports for the occupation of Mechanical Engineer Technician a median income of \$54,480 in within US (salary range: min \$34,030 / max \$82,810) with 15% of those currently in the occupation having a bachelor's degree and 83% having educational levels below

bachelor's degree. For the Mechanical Engineer a median income (across the US) of \$84,190 is reported (salary range: min \$54,420 / max \$131,350). For those currently in the occupation as Mechanical Engineer, 52% have a bachelor's degree and another 23% have something higher than a bachelor's degree in post-secondary education.

Both degrees, one with a focus in History and one with a focus in Engineering, are designated as 4-year bachelor's degree, yielding quite differing benefits dependent on occupation selection and ultimately results in vastly differing lifetime earnings. This occupational dependent impact gives rise to the phenomena of "the Millionaire Next Door", a popularized account written by Thomas J. Stanley, of occupational wealth accumulation.

Table 2: Student Decision Alternative Occupational Outcomes

Table 1: 4 year Bachelor Degree at University									
	Major	Occupation	Median	Salary Range -		% currently in this profession			
			Salary	Minimum	Maximum	<Bachelor	Bachelor	>Bachelor	
Student A	History	Tour Guide & Escort					62%	25%	12%
			US	\$43,060	\$18,300	\$43,060			
			Orlando, FL	\$25,390	\$20,300	\$37,220			
		Curator					17%	35%	49%
			US	\$53,360	\$29,700	\$94,430			
			Orlando, FL	\$47,380	\$31,730	\$80,340			
Student B	Engineering	Mechanical Eng Technician					83%	15%	3%
			US	\$54,480	\$34,030	\$82,810			
			Orlando, FL	\$44,390	\$22,650	\$63,440			
		Mechanical Engineer					24%	52%	23%
			US	\$84,190	\$54,420	\$131,350			
			Orlando, FL	\$97,920	\$58,150	\$153,920			

III.1.1 *Question and Hypothesis:*

Our question remains, is there an adequate return on investment to the student to attend a form (or level) of post-secondary education?

The proposed simple model anticipates net benefits to increase as the level of post-secondary education increases. One would expect a direct positive relationship between educational level and net benefits. However, this relationship could possibly be moderated by occupational considerations. The hypothesis to be tested:

H1:

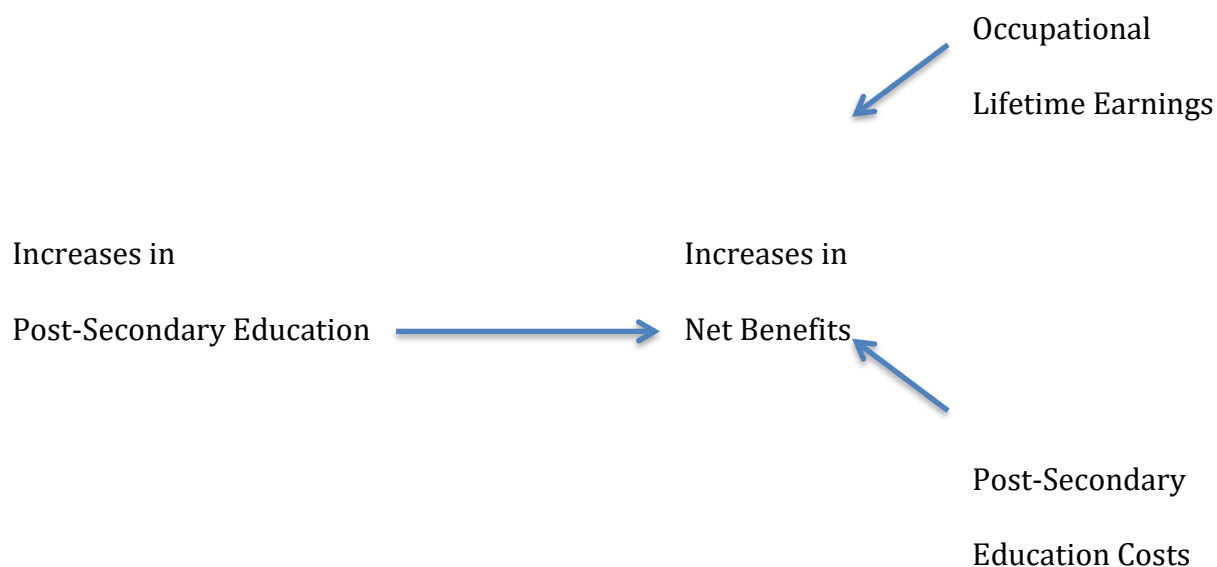
As training levels obtained through post-secondary education increases, net benefits as measured over a lifetime increase. The strength and magnitude of this relationship may depend to some extent on occupation.

H2:

Candidates with higher levels of post-secondary education match job requirements with higher earning job openings.

H3:

Higher lifetime earning occupations correspond to occupations requiring non-routine analytic and non-routine interactive skills and abilities.



$$\text{Net Benefits} = f(\text{Occupational Lifetime earnings} - \text{post-secondary education cost})$$

Figure 5: Net Benefit Generalized Model

Two primary inputs will be utilized in the student stakeholder analysis: Lifetime earnings (by occupation) and costs of post-secondary education (by type of institution and duration of attendance). In order to facilitate analysis, a single business sector within a limited geographic region has been selected to analyze lifetime earnings.

To determine the most relevant business sector and geographic region, a general review regarding the future direction of the US economy yields a common agreement that the labor markets are changing given technological innovations of various kinds (Oxford, Autor), leading some to suggest that sectors such as Healthcare, Construction and Information Technology are poised to dominate the future landscape of the economy. (Cornell) These sectors are thought to be both the engine for future economic growth and aligned with market needs or demands within a developed economy such as the US, characterized by aging demographics.

With this general consensus as a backdrop, the Construction sector within the state of Florida was chosen to be examined relative to lifetime earnings and occupational variations. The

Construction sector is a vibrant sector in the state and employs over 6% of the population currently employed. The state of Florida is the third largest state in the US representing 21 million in population (US Census). characterized by fairly good weather year-round allowing for near constant construction activity which yields a critical mass of sector data given fewer weather induced variations than might be characterized in other states. This sector also exhibits fewer international influences, such as off shore service providers or international trade impacts from either export or import considerations, conditions which points towards fewer moderating factors to consider leaving a clearer line of sight to the relationship between lifetime earnings and post-secondary education attainment.

The Construction sector is also comprised of a multitude of occupations which allows for an evaluation of skills associated with the categories proposed by Autor (manual, routine etc.)

Segmenting census data (American Community Survey) according to industry sector (Construction) within a single state (Florida) provides the ability to compare data to prior studies for consistency of results or identify possible trends that are in process as technology evolves driving changing employer skill needs and demand.

Earnings: To evaluate the earnings component of the net benefit equation, “The College Payoff” research conducted by Carnevale, Rose & Cheah (2011) has been utilized. These authors associated with the Georgetown University Center on Education and the Workforce, used data from the American Community Survey last updated in 2009. Their research approach to lifetime earnings calculations has been replicated for specific targeted occupational categories and extended by utilizing the latest American Community Survey data from 2016. Where the “College Payoff” (Carnevale et. al, 2011) used national data across all occupations, the strategy

of this paper will be to follow the same methodology applied to occupations within the Construction sector in the state of Florida.

Costs: The cost variables to be considered will include a.) the cost of tuition b.) estimated living expenses for the duration of education and c.) the opportunity cost or earnings that one foregoes by not entering directly into the workforce from high school. Costs associated with both estimated living expenses (b.) and opportunity costs (c.) will be considered the same regardless of post-secondary institution chosen or occupation pursued, thereby making the meaningful variable creating unique variability the cost of tuition and living expenses (a.) & (b.) and the majority of focus will be on what drives variation in those two categories.

III.1.2 Sample: Data Source

The US Census Bureau collects demographic data throughout the country at routine intervals. (US Census American Community Survey). The data is segmented by state and is designed to acquire data by household as well as by individual. Many pieces of data are included in the survey cutting across social, economic, and demographic dimensions. Some data is collected as frequently as annually with a more comprehensive data list acquired every five years. The five-year survey data interval (2012 - 2016) as it pertains to lifetime earnings, occupation, age and education attainment by business sector and by state is the source of earnings, age. and education attainment data for this study.

The primary data source for post-secondary educational costs began with the US Department of Education data bank: the “College Scorecard” (Appendix B: Exhibit 1). It was used as the foundation for post-secondary institution selection. This scorecard provided detailed information regarding school characteristics as well as baseline costs. Only Florida post-secondary institutions were considered in the cost analysis.

Once institutions were selected, the College Scorecard linked to individual post-secondary school “net calculators”. A series of questions appear at each school “net calculator”. Given the myriad of individual student situations that exist, it was necessary to create a base case that could address the series of questions initiated by the post-secondary institution. The typical questions and base case can be found in Appendix B - Exhibit 2. In the base case, all prospective students were assumed to be Florida residents, so costs are calculated as “in state” status. The base case defined in this Exhibit creates a platform for direct comparison of costs across selected institutions.

III.1.3 Variables:

In the model depicted above in Figure 5, the independent variables used include education level and age. The dependent variable is lifetime earnings. These variables are obtained for the Construction sector overall as well as individual occupations within the sector.

The methodology utilized by the “College Payoff” (Carnavale et. al, 2011) has been replicated to the extent technical notes allow for discovery. Several additional boundary conditions were utilized as common-sense delimiters to the data set. As noted, the “College Payoff” utilized ACS survey data spanning the years 2006-2009. The “College Payoff” study utilized data which encompassed the entire US for all sectors reported in the ACS data, where this study isolates data for the Construction sector only in the state of Florida. In addition, the data taken during the 2006 -2009 for the “College Payoff” timeframe overlapped a general economic environment when the US was entering the “great recession” and the construction sector was certainly impacted in a negative way by macroeconomic events of this period.

III.1.3.1 Lifetime Earnings- Dependent Variable

As noted, the American Community Survey (ACS) was the primary data source for lifetime earnings. Specifically, this study replicated to the extent possible and discoverable, the “College Payoff” (Carnevale, et. al. 2011) methodology regarding lifetime earnings calculations. The “College Payoff” study used earnings data obtained within designated five-year age brackets beginning with respondents of age 25 through and including age 64, for a total of 8 brackets. Each bracket median was determined from ACS data set. The “College Payoff” study adjusted earnings in these brackets to 2009 dollars and summed medians across age brackets to arrive at lifetime earnings.

In order to acquire the most recent data available, this paper utilized ACS data from a five year time horizon 2012-2016, and grouped earnings data into 5 year brackets as described above, and utilized medians from each bracket as did the “College Payoff” study. Prior to grouping, reported data was adjusted to 2016 constant dollars using index factors provided by the US Census Bureau designed for the specific purpose of adjustment of data to real or constant dollars, (Constant Dollar Adjustment Factors) . These same factors were used to adjust “College Payoff” results from 2009 dollars to 2016 dollars to allow direct comparisons between both studies. Comparisons were made between “Payoff” results as they pertain to the total US population whereas this study focused solely on occupations within the Construction sector reporting for the state of Florida.

ACS “person records” (as opposed to household records) were utilized for persons in the eight defined age brackets meeting the following criteria:

1. Civilian, currently employed
2. Employed in for-profit private sector and self-employed (both incorporated and unincorporated)

3. Worked in the past 12 months
4. Weeks worked in the past year: 50-52
5. Hours worked per week- 40+
6. Total Earnings meeting minimum wage threshold: >\$16,743 annually
7. Industry Sector: Construction
8. State of Employment: Florida

Lifetime earnings were calculated by summing the median earnings of persons reporting, within the 5-year age brackets, meeting these criteria and adjusted to constant 2016 dollars. The total data base yielded 13,108 records that met these criteria.

III.1.3.2 Education Attainment- Independent Variable

The ACS survey captures educational attainment by individual reporting. Respondents indicate level of education attainment via grade attended and degree (or diploma) awarded. For instance, data is captured both for individuals who attended 12th grade-no diploma as well as 12th grade- diploma. Key category designators hinge on degree completion as seen below. In order to mirror the “College Payoff” methodology, educational attainment records were organized into the following categories:

1. High School or below- no diploma
2. High School Diploma
3. Some College-no diploma
4. Associates degree
5. Bachelor’s degree
6. Masters, Professional, Doctorate degree (all combined)

III.1.3.3 Cost- Independent Variable

The cost of attaining any level of post-secondary education varies wildly depending on type of institution one considers, geographic locations of the institution, and desired discipline of study among many other things, not least of which includes the amount of financial support one can expect given the current financial income of the prospective student's household. For this reason, it requires caution to generalize comments regarding the topic of the cost of post-secondary education until some context is given to these important aspects.

This paper has relied on the work performed by Brad Hershbein and Kevin Hollenbeck of the Upjohn Institute (2014) in their article, "College Costs: Students Can't Afford Not to Know". In their article, the authors acknowledge the wide range of actual costs depending on the many factors at play when selecting a post-secondary institution to attend. They sourced much of their information from the US Department of Education and proposed a standardized "Net Price" comparison document which supports common definitions and institution attributes that can be found at the web site: [US Dept. of Education College Scorecard](#). (Appendix B – Exhibit 1)

The College Scorecard provides a standardized format that is necessary for the proper and most informed evaluation and comparison by a prospective student and their family. The direct links from the College Scorecard website to specific institution web pages accelerates the navigation of pertinent information for the evaluation. In an effort to keep vernacular consistent with clear meanings the College Scorecard has put together a comprehensive profile for major post-secondary institutions around the country. This study has tapped into that source and selected post-secondary institutions within the state of Florida to evaluate both "list" and "net" costs in order to calculate net benefits to the student when compared to lifetime earning differentials.

In addition to use of the College Scorecard information, this paper adapts the “net” price comparison document format proposed by Hollenbeck, et. al, (2014) and adds attributes that pertain to the topic of net cost for institutions selected in the State of Florida supporting a curriculum that lends itself to disciplines concerned with Construction Services and general Business Management. Institutions selected for comparison in this paper represent major institutions (student population above 15,000 students with the exception of one) of various categories of post-secondary degree formats aligned with earnings and educational attainment data categories selected from the ACS survey. A total of seven post-secondary educational institutions were selected, four of which were 4-year universities, two 2-year colleges and one college that awards certificates. All institutions selected for comparison are public institutions.

The College Scorecard website provides information for specific institutions and definitions of cost variables based on “typical” information relating to their student body.

Specific information utilized in this paper includes:

1. “Average Annual Cost” – referred to as “List” price, without consideration for financial support stemming from either grants or financial aid.
2. “Earnings After School” – a percentage reported of those students earning above high school graduates as well as the “median salary of former students,...10 years after entering school” compared to national average median salary.

In Appendix B, Exhibits 1-2, both contain information regarding the College Scorecard information, as well as base case student assumptions used for the “net cost” calculator for attending the University of Florida- Gainesville, Florida. The information at the College Scorecard website provides links to the post-secondary institutional homepages providing specific information beyond the general format found at the College Scorecard website.

Assumptions:

Several assumptions are necessary for proper analysis and interpretation of both cost and earnings data. The replication of the “College Payoff” earnings results will be targeted on the occupations under investigation aligned to the employer stakeholder model focused on construction. It is assumed that the state of Florida, given the state’s size in terms of population and the sector’s importance in the economy, is generally representative of the US at large and constitutes a good proxy for comparison to “College Payoff” results.

In calculating lifetime earnings, an assumption is made that an individual remains within an occupation for the duration of their lifetime. This assumption allows the ACS data to provide a snapshot of occupational career earnings at a single point in time. Indeed, employer interviews validated that those in the industry remain in the industry, not necessarily occupation, for lengthy periods of time.

Assumptions relating to costs for post-secondary education can be found in Appendix B, Exhibit 2. The base case defines a student as a Florida resident, in a household of four with one working parent, earning the median annual wage in Florida \$64,000, paying the average annual taxes paid in Florida \$14,750, and intending to live on campus. Questions regarding these topics were asked at the four major university “net cost calculator” web sites and all were answered in the same manner in order to obtain comparative results.

III.1.4 Analysis

A general sector analysis has been performed on selected person records of the ACS 2012-2016 data set. A summary of the records attached to the final data set of 13,108 records is:

Table 3: ACS Data Records Profile: Florida

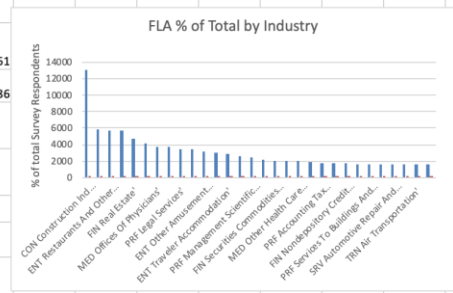
ACS 2012-2016	Records
State of Florida	960,000
State of Florida (Age 24-65)	490,000
State of Florida (Age 24-65) Employed	180,000
State of Florida (Age 24-65) Employed in Construction Industry	15,415
Employed min wage floor in Construction	13,108

The Construction sector itself represents a substantial piece of the Florida labor market.

The table below indicates the Construction sector employs the largest number of responding individuals currently employed in the state of Florida between the ages of 24 and 65, over 8% of the total respondents exceeding by double the next biggest business sector, medical hospitals.

Table 4: Florida Industry Frequencies (ACS Data Sample)

	Frequency	Percent	Valid Percent	Cumulative Percent	
Total	160159	100.0	100.0		
CON Construction Incl Cleaning During And Imm after'	13108	8.2	8.2	10.2	0.102161
MED Hospitals'	5849	3.7	3.7	86.5	0.045586
ENT Restaurants And Other Food Services'	5748	3.6	3.6	97.0	
FIN Insurance Carriers And Related Activities'	5734	3.6	3.6	50.2	
FIN Real Estate'	4697	2.9	2.9	57.0	
FIN Banking And Related Activities'	4176	2.6	2.6	52.8	
MED Offices Of Physicians'	3771	2.4	2.4	78.9	



Within the selected data set of 13,108 records reporting under the Construction NAICS Industry Code, 195 separate occupations were reportedly mapped into the sector. Of the 195 occupations 18 were chosen for analysis. These 18 occupations were selected as they represent slightly less than 80% of the total respondents; in excess of 10,000 of the total 13,108 respondents. The frequency table associated with occupations within the Construction sector of

the data set , along with the respective respondent numbers and percentage of total as well as cumulative percentages appear below.

Table 5: ACS Sample: Construction Occupations Highest Number of Respondents by Occupation

	Frequency	Percent	Valid Percent	Cumulative Percent
Total	13108	100.0	100.0	
✓ CON Construction Laborers'	1532	11.7	11.7	66.1
✓ CON First Line Supervisors Of Construction Trades And	1256	9.6	9.6	45.5
✓ MGR Construction Managers'	1247	9.5	9.5	14.9
✓ CON Carpenters'	940	7.2	7.2	52.7
✓ MGR Miscellaneous Managers Incl Funeral Service Managers	833	6.4	6.4	21.4
✓ CON Electricians'	778	5.9	5.9	75.0
✓ RPR Heating Air Conditioning And Refrigeration Mechanics	587	4.5	4.5	94.9
✓ CON Pipelayers Plumbers Pipefitters And Steamfitters'	576	4.4	4.4	83.4
✓ CON Painters And Paperhangers'	460	3.5	3.5	79.0
✓ OFF Secretaries And Administrative Assistants'	383	2.9	2.9	34.9
✓ MGR Chief Executives And Legislators'	342	2.6	2.6	3.5
✓ CON Construction Equip Operators Except Paving Surfacing And Tamping Equip	276	2.1	2.1	68.3
✓ TRN Driver Sales Workers And Truck Drivers'	243	1.9	1.9	99.3
✓ CON Roofers'	223	1.7	1.7	85.7
✓ SAL Sales Representatives Services All Other'	191	1.5	1.5	28.6
CON Carpet Floor And Tile Installers And Finishers'	187	1.4	1.4	54.1
✓ BUS Cost Estimators'	183	1.4	1.4	22.9
✓ OFF Bookkeeping Accounting And Auditing Clerks'	143	1.1	1.1	30.8
✓ MGR General And Operations Managers'	118	0.9	0.9	0.9

ANOVA

An analysis performed on total sector data as well as each of the 18 occupations includes using SPSS to perform One Way ANOVA with post-hoc testing on the variables “weighted wage” by factor “educational levels” for the six groupings of educational attainment reported. ANOVA F-Ratios were evaluated for overall significance between education attainment and weighted wages (Pallent p.217), effect size was calculated to determine magnitude or “strength of association” (Pallent p.218) and Post Hoc testing using Tukey Honestly Significant Different Test (HSD) (Pallent p.217) was calculated to identify significant differences between individual educational groups.

Correlation Analysis

Correlation Analysis was performed between earnings (WtdWage) and education levels (ED) using the SPSS tool. The direction of the relationship was confirmed, and the strength of the relationship was calculated using Spearman's rho test given use of medians and therefore non-parametric nature of the data. In addition, the coefficient of determination was calculated (r-squared) to understand the extent of variance overlap between groups (Pallent p. 139)

Kruskall-Wallis Test of Differences (Pallent p.242-243)

The Kruskal-Wallis test was used to determine Chi-Square values to identify if differences in education grouping medians were significant.

Linear Regression

Simple linear regressions were calculated using SPSS and designating the dependent variable as lifetime earnings (Wtdwage) and using two independent variables: age group and education attainment (ED). The model calculated variable coefficients as well as adjusted R Square for each scenario.

The hypothesis anticipates a direct or positive relationship will exist between wtd wages and educational attainment levels. It also anticipates higher effect indication for those occupations within the sector requiring more cognitive, non-routine skills.

III.1.5 Results

III.1.5.1 General Results from Statistical Analysis of ACS 2012-2016 data

An analysis template used to calculate statistics described in the prior section as they relate to various sector categories and individual occupations was developed. Each occupation template included lifetime earnings (2016 constant dollars) by educational attainment levels as well as the aforementioned descriptive statistics. Individual occupational worksheets are found in

Appendix B- Exhibit 3. Pertinent data was taken from each worksheet and summarized on the Occupational Analysis Results Summary located in Appendix A – Exhibit 1. The analysis summary sheet includes results pertaining to the following groups:

- ❖ Florida – All Industry sectors- excluding Construction sector
- ❖ Florida- Construction sector only- all occupations
- ❖ Florida- Construction sector- 18 occupations representing 80% of all occupations
- ❖ Florida- All Industry sectors excluding Construction data for 3 selected occupations

This grouping and analysis strategy allowed comparison of the Construction sector in total with other industry sectors in the state, as well as individual occupations, three of which were selected to compare with other industry sectors.

A review of the analysis summary sheet and the statistical results from correlation, Kruskal-Wallis and Linear regression, reveal significant results (likely due to large sample sizes) however “weak” but on occasion “medium” strength.

- ◇ **Correlation Tests:** Spearman rho results for all industries has “medium” effect size (Burns p.358), while the Construction sector in total also demonstrates a “medium” effect size, however a somewhat smaller effect than all industries. There were three occupations out of the eighteen that also demonstrated “medium” effect size. Those occupations were: Misc. Managers, Chief Executives & Legislatures, and Sales Reps. No other occupation demonstrated anything other than “small” effects. It is also notable that for occupations: Cost Estimator, Bookkeeping & Accounting, and Managers, General & Operations, not only were those occupations within the Construction sector exhibit “small effect” size, but those occupations across all sectors showed no material differences and showed “small effect” sizes well.

- ◇ **One way ANOVA non parametric Kruskal-Wallis Tests:** As an indicator of significant differences between education group median earnings (Burns & Burns p.315), eleven out of the eighteen occupational scenarios exhibited significant Chi-Square values at the .005 level with the exception of seven occupations: HVAC, Office Secretary & Administrative Assistants, Equipment operation-Paving, Drivers-Sales & Truck, Roofer, Bookkeeping-Accounting & Audit, and Cost Estimators (All Industries).
- ◇ **Linear Regression:** A review of the adjusted R^2 across all scenarios shows the largest value at .156 calculated for All Industries and a low of $R^2 = .002$ calculated for the occupation “Drivers, Sales, Trucks”. Setting aside “All Industries” and “All Construction”, only a single occupational scenario exhibited an adjusted R^2 greater than .10, that of Managers, General & Operations” for both “All Industries” data set as well as within the “Construction” sector only data set.

III.1.5.2 Comparative Results between Current Analysis and “College Payoff” study

It is important to note the findings of this analysis represent a smaller subset within the data pool used by the “College Payoff”. Where the “College Payoff” study used US national person data from the ACS in 2006-2009, this study used only Florida data. The comparison will focus on the same sector: Construction, as well as the same occupational codes. Both data sets have been adjusted to 2016 constant dollars to facilitate direct comparison. The lifetime earnings calculations by occupation exist on each respective occupational analysis template, with median earnings by 5-year age brackets calculated.

The “Payoff Comparison by Occupation” summary sheet between this study and the “College Payoff” can be found in Appendix A – Exhibit 2. Each occupation is represented with lifetime earnings associated with various educational attainment levels. Any differences in

results that exceed 20% are highlighted in yellow. Any differences that exist due to lack of data or result from either study is highlighted in blue.

A general overview reveals sporadic differences highlighted in yellow across eleven of the eighteen occupations examined. Three occupations however, appear to reveal persistent differences above 20% across three or more educational attainment levels. These occupations include: First Line Supervision, Carpenters, and Electricians.

III.1.5.3 Cost Comparison for Post-Secondary Education

As described in the prior section, post-secondary institutions having various profiles within the state of Florida have been compared relying on the College Scorecard as well as institutional web sites as the source of information. Aligned with the approach by Hershbein et al, (2014) both the “list” price and “net” price have been calculated with the cautionary note that assumptions of averages can be misleading. The results are compiled and catalogued in the Cost Comparison Worksheet in Appendix A – Exhibit 3. Annual “list” price range is from \$11,444 annually (Seminole State) to \$21, 840 annually (University of Central Florida). The “net” price range is from a low of \$4,731 annually (Lake-Sumter State) to a high of \$15,664 annually (Florida State University). “Net” cost data includes financial aid of all forms, both grants and loans from any and all sources.

The lower quadrant of this Cost Comparison worksheet in Appendix A – Exhibit 3 contains the “cost build up” resulting from cost estimates from each of the four university’s “net price” calculator using the assumptions outlined above. The cost build up assumes grants based on family income, etc. as defined in the assumption section. The “net” cost was averaged from this information. Total cost associated with the categories of tuition, books/ supplies and

personal expenses was estimated at \$54,000 for four years at a post-secondary institution with the objective to attain a bachelor's degree. This amount of funding was assumed to be borrowed as a student loan at a fixed interest rate between 8-11% with repayment over a 10-year horizon beginning at graduation. This cost information was fed into NPV formulas, combined with occupational earnings to calculate NPV values for individual occupations.

To further the analysis in accordance with the job categories devised by Autor et. al, an occupational skill matrix was developed and can be found in Appendix A – Exhibit 4. Skill categories were mapped to definitions derived from ONet, the Department of Labor's repository for occupational definitions. These were matched to construction occupations and placed in their respective categories. All information relating to occupational lifetime earnings and calculated NPV's are summarized in Figure below.

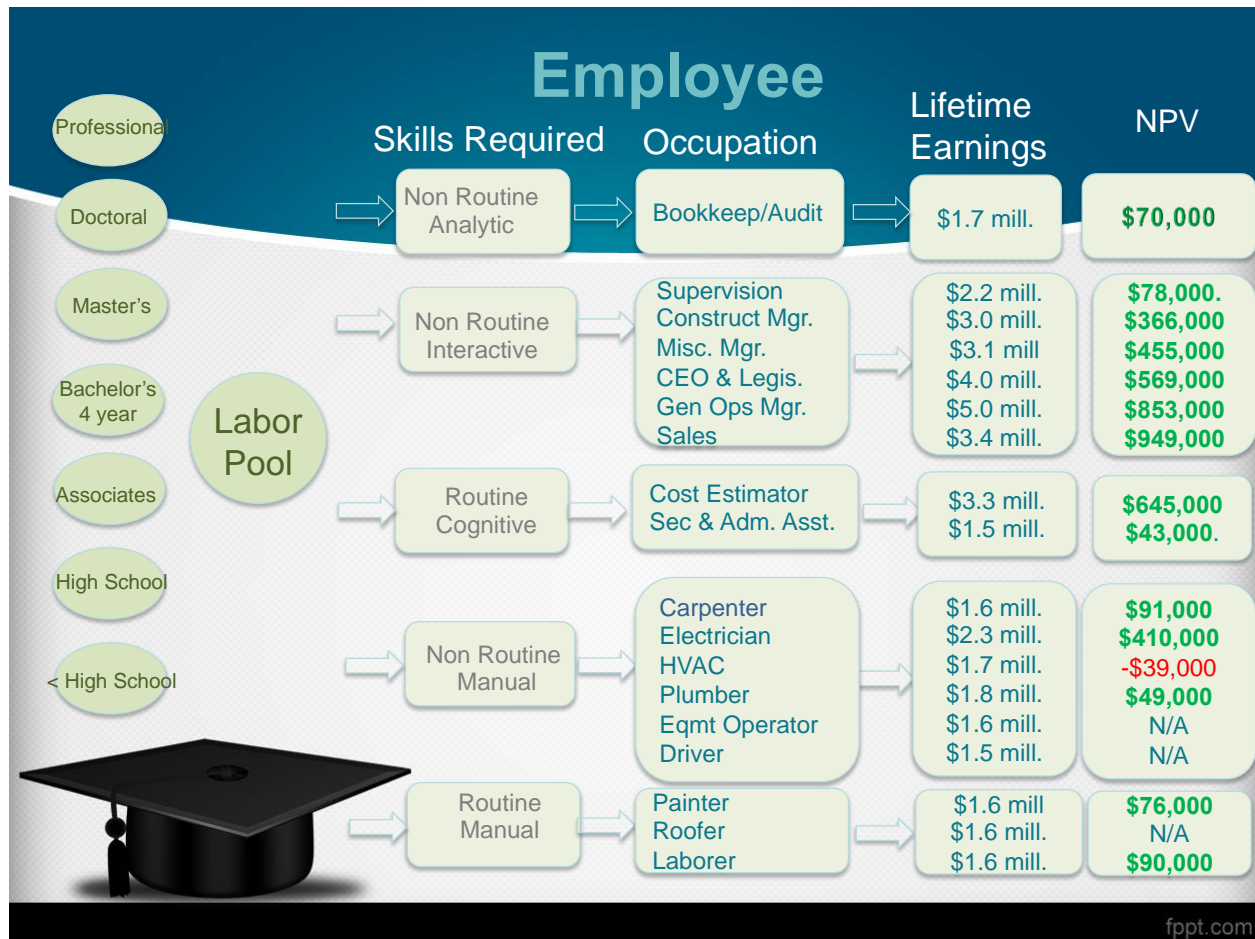


Figure 6: Construction Occupational Composite Lifetime Earnings and NPV by occupational category

These results lead to the following conclusions regarding the original hypothesis for this stakeholder.

H1: As training levels obtained through post-secondary education increases, net benefits as measured over a lifetime increase. The strength and magnitude of this relationship may depend to some extent on occupation.

In nearly every case a positive NPV is associated with the calculated investment in post secondary education (specifically 4 yr. bachelor's degree) regardless of occupation. It should be noted the magnitude of the NPV values varies with occupation. The category that

exhibits the highest level of responsiveness to this condition is the “non-routine interactive” category. This positive relationship between education and earnings however is not reinforced via statistical testing and analysis. Adjusted R2 were calculated at extremely low levels. Correlations between education and earnings were confirmed positive however the strength of the relationship never achieved high effect, although the relationship met medium effect in aggregate.

H2: Candidates with higher levels of post-secondary education match job requirements with higher earning job openings.

A conclusion regarding this hypothesis would require a calculation of overlapping earnings be conducted by occupation via educational attainment by age bracket. Such a process has been outlined in the “College Payoff” (Carnevale et.al, 2011) where “variations in earnings by education and occupation earnings overlap” were calculated. Evidence that pertains to this topic within this study resides in the Occupational Skill Matrix in Appendix A, Exhibit 5. There are at least 3 occupations where no data exists for any respondent having a bachelor’s degree. These occupations exist within the Autor categories of: “Non-routine manual” and “routine manual”. The occupations are: Equipment Operators, Drivers and Roofers. This information, although it does not conclusively confirm this hypothesis, does contribute to our understanding when considered within the context of the H3 below.

H3: Higher lifetime earning occupations correspond to occupations requiring non-routine analytic and non-routine interactive skills and abilities.

The “Occupational Skill Matrix” found in Appendix A- Exhibit 4 provides the evidence for partial confirmation of this hypothesis as does Figure 6 above. In the Occupational Skill Matrix, a weighted average of earnings differentials between those sample respondents obtaining

a bachelor's degree versus those obtaining a high school diploma have been calculated for occupations listed within the category designations by Autor et. al, These calculations show that those respondents in the "non-routine cognitive interactive" category had lifetime earnings differentials over twice the earnings differentials than those respondents in the "routine manual" and "non-routine manual" categories, as well as the "non-routine cognitive analysis" category. The differentials were closer between "non-routine cognitive interactive" and "routine cognitive" at about 20% higher earnings in favor of "non-routine cognitive interactive".

III.2 Stage 2: The Employer Stakeholder Method, Analysis & Results

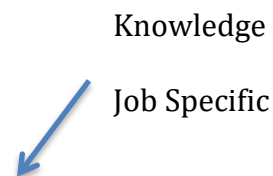
To perform the cost-benefit analysis as it relates to post-secondary education from the employer point of view, a qualitative study comprised of semi-structured in-depth interviews with private sector employers has been conducted. As the model in the prior section suggests, employers require a varied mix of knowledge, skills and abilities depending on the occupational duties the employer requires in order to deliver the firms product and/or services to the marketplace. The employer interviews were designed to seek understanding from the employer point of view as to the adequacy and overall value of training attained by a prospective candidate via a post-secondary education and if such training is "matched" with employers defined needs. Further the interviews sought to provide insight as to the nature and extent of any deficiencies that were perceived to exist in this matching of needs and KSA's, as well as the methods used by employers to resolve any mismatch.

III.2.1 *Question and Hypothesis*

In general, the matching process between employer and available labor has been explored as well as specifics related to the provision of skills or institutional training provided to labor for hire via post-secondary education. Key issues for understanding via the employer interview

included whether the employer views the current labor pool from which recruitment takes place, to possess the requisite knowledge, skills and abilities (KSA's) that prospective employers, in this case construction sector employers, require to fill job openings. Recognizing that employers typically wish to match specific "technical" or "hard" skills related to an occupation (say "project management" for a Project Manager position) as well as match general interactive "people" or "soft" skills (say "communication" for a Construction Manager), the question and hypothesis of this stakeholder has several parts given the multiple dimensions of employer needs.

The interview seeks to understand if the employer relies on post-secondary education to impart either type of skill, technical or people skills, or both, on those prospective employee candidates who have attended these institutions. The interview also seeks to understand which occupations or institutions the employer perceives having greater value relative to these issues. Our model suggests a hypothesis in which greater reliance on post-secondary training of both technical and people skills when considering candidates for occupations within the sector which is "non-routine" both interactive and analytic in nature.



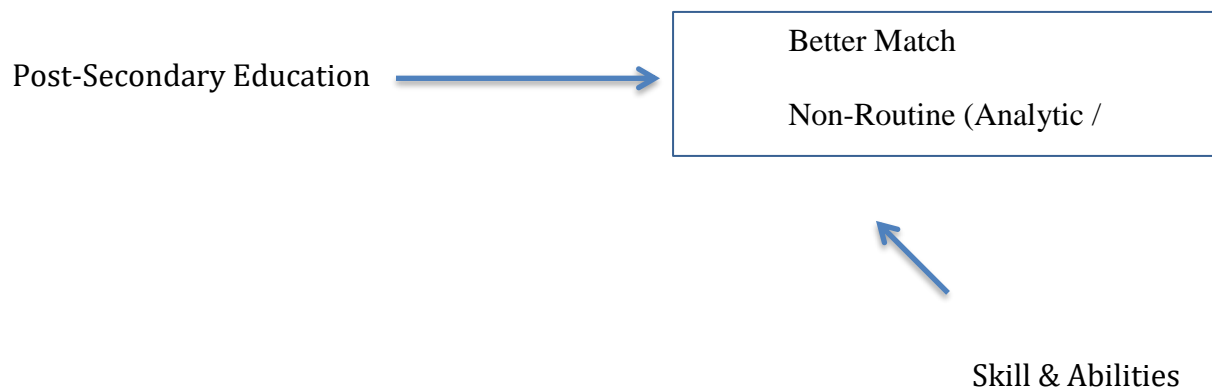


Figure 7: Employer Knowledge, Skills & Abilities (KSA) Requirements “Technical” & “Soft”

H1:

Candidates with higher levels of post-secondary education display more comprehensive skill set inclusive of both technical job specific knowledge, as well as skills and abilities (analytic and interactive) than those job candidates who do not attend post-secondary education.

H2:

Employers who interact with post-secondary institutions to influence curriculum content are more satisfied with job candidate skills, which result in a better overall job requirement match. (retention or number recruited)

III.2.2 Sample: Data Source

Employers within the Orlando metro area in general, as reported in the publication: The Orlando Business Journal Book of Lists 2017-2018, were the primary contacts to become possible interview participants. Metropolitan Orlando represents roughly 2 million of the total populations of roughly 21 million who live in the state of Florida ([World Population website](#)) Orlando, considered the third largest city in the state represents a varied employer participant pool. The Orlando Business Journal Book of Lists is “Central Florida’s only compilation of

industry lists that features the top companies and business leaders throughout the metro area.”

(OBJ p.2)

The Book of Lists compile information for many business categories ranging from “Advertising” to “Women-owned Businesses” within Central Florida. For this study those companies cited on the following lists published in the OBJ Book of Lists 2017-2018 were considered:

1. Construction Companies / General Contractors (p.28)
2. Construction Companies / General Contractors – National (p.30)
3. Specialty Contractors (p.42)
4. Central Florida Fast 50 (Ranked by % of growth) (p.61-62)
5. Golden 100: Top Privately Held Companies (p.66-70)
6. Florida Fast 100 (p.132-135)

This resource was very useful in that company information regarding operating revenue, number of employees, address and company contact information was provided for many companies included on the list.

As with most industry sectors, participants in the Construction industry sector, have various roles. The web site [BuzzFile](#) describes itself as “The most advanced company information data base.” At this web site detailed definitions of the Sectors, Categories and Industry are linked to appreciate the facets to the overall industry. The detailed information for these descriptors is in Appendix B, Exhibit 4.

The ACS data base utilized two industry descriptors which were cross referenced into the lists of employer participants contacted and interviewed. This includes the “North American Industry Classification System (NAICS) code 23 “.CON-Construction, Incl Cleanings During

and IMM After”. A complete definition of what is included in this industry can be found at the web site: [NAICS Sector 23 definition](#)

Finally, to create consistency between the ACS occupational information and employer participant feedback the “Standard Occupational Classification (SOC)” was cross referenced into this sector to inform the interviewer and participant regarding occupational roles and responsibilities. ([Bureau of Labor SOC definitions](#))

III.2.3 Variables

Over thirty employers considered part of the construction sector as defined in BuzzFile and listed in the Orlando Business Journal Book of Lists were contacted for participation in the semi-structured interviews. Of those who responded and willing to participate, a power point file was forwarded to the interview contact in advance of the interview so as to allay concerns related to the study purpose and confidentiality. The power point included the base questions listed in Appendix B, Exhibit 5. Participants valued the ability to access the questions in advance in order to understand the nature of the questions and in one instance the owner used the questions as a tool to stimulate thought with his/her on- site leadership team regarding future labor strategies. A total of twelve (12) employer interviews were conducted.

A general investigation of the following topics was advanced:

1. General Nature and Scope of Business
2. Current Labor Force Composition- number and type of positions
3. Changing Skill Requirements due to increased technology
4. Educational Requirements for labor force
5. Recruitment Feedback based on hiring those with post-secondary education
6. Interns

7. Post-Secondary Alliances

8. Future Trends

All interviews were conducted with either Owners, Operational, Financial or Human Resource Managers or Executives. Given the general and overall knowledge possessed by the Human Resources and the specific knowledge possessed by the hiring manager of a particular position, individuals in either role were accepted as participants with an understanding individual nuances due to respective frame of reference to labor markets could exist.

A summary of employer participant attributes can be found in Table A. This table lists several attributes associated with the individual interviewee: years of service and level of post-secondary education, if any. It also lists employer attributes such as annual sales, number of employees, and specific type of sector participation. All interviews were conducted over a three-month period during the Summer of 2018. All interviews were recorded, and several lasted over the one hour allotted period of time.

III.2.4 *Employer Interviews Content Analysis*

The interview analysis was divided into two general sections: macroeconomic industry issues and microeconomic issues related specifically to company operations. Within the macroeconomic section, issues related to the general business climate of the state and the nation and its impact on construction activity were discussed. In addition, industry-wide technology advances across methods and materials were also factors discussed in the context of driving change among industry participants.

In the microeconomic section pertaining to key industry participants, information was further divided into four main groupings of participants: General Contractors, Owner/Developer, Design & Engineering and Trades. Of these four groupings, the main focus was placed on the

General Contractor and Trades categories as these groups, although diverse in nature, encompassed the majority of occupational listings associated with the Construction sector. Microeconomic information that pertained to issues within these two groups – General Contractor and Trades, were analyzed with greater detail via NVivo qualitative analysis software package. Node listings were set up, and recorded interviews were transcribed and mapped to nodes which pertained to content. A diagram of the content analysis design (NVivo Mind Map) appears below in Fig. 8:

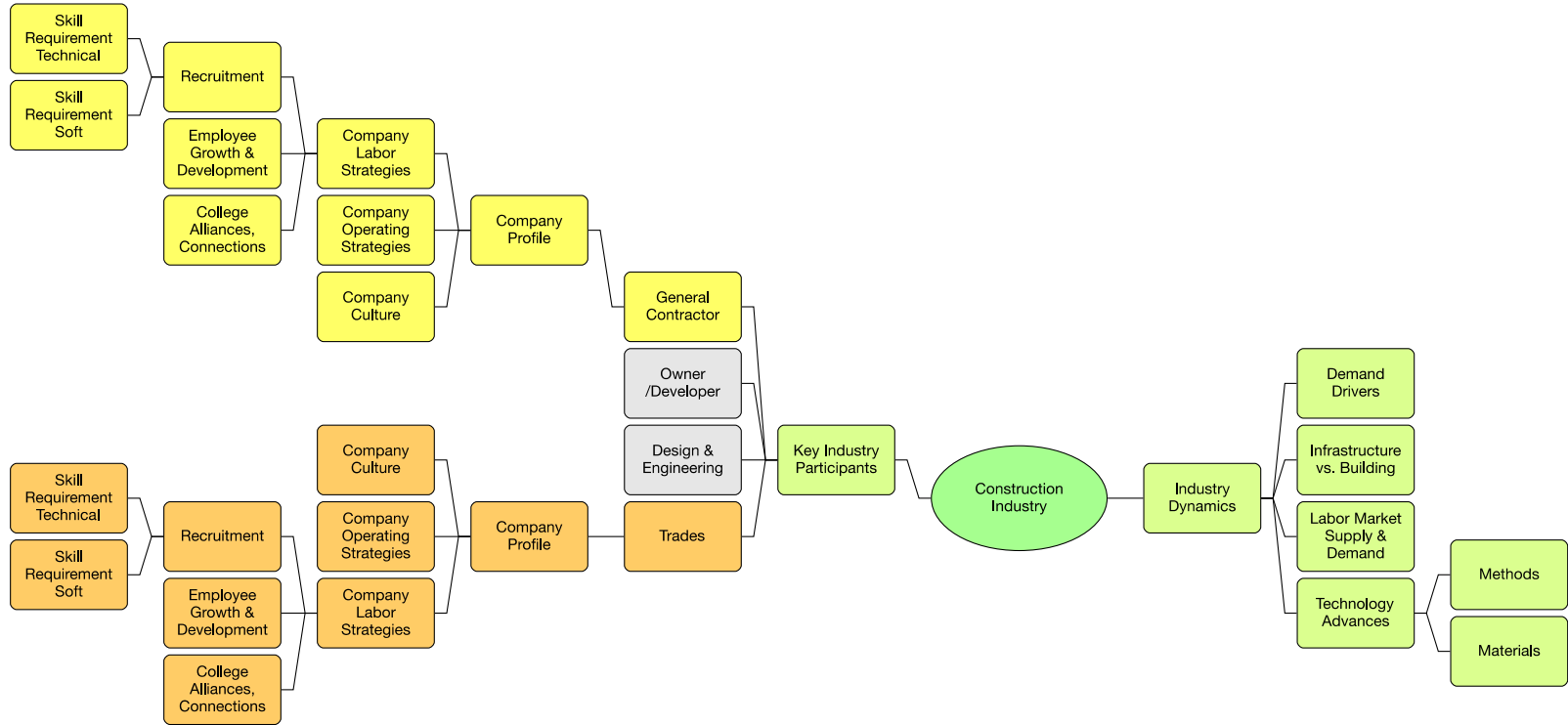


Figure 8: Content Analysis Design NVivo “Mind Map”

In addition to content analysis in accordance with the above design, specific nodes were developed and used to accumulate, summarize and analyze content. These parent-child nodes listings appear in Appendix B, Exhibit 7 for reference.

III.2.5 Results

Content analysis results reveal emergent themes from both the macroeconomic section as well as the microeconomic section. The macroeconomic section will be addressed first as it drives company responses in many instances.

III.2.5.1 Macroeconomic Industry Themes

Content analysis in this section will be broken into two components: General Economic trends and the associated impact to building maintenance and expansion within the construction sector, and the accompanying impact to the labor market in general. The second component will summarize the interviewees viewpoints regarding technology and trends in the sector.

III.2.5.1.1 General Economic Trends

Nearly all participants concurred on the “tight” condition of the current (summer 2018) labor market both for skilled and unskilled labor. Generally good economic conditions, GDP = 3.4% annually, has created high demand in the construction sector both for infrastructure (horizontal) building as well as buildings (vertical) structures. Interviewee participants represented firms that provide construction services in some part to both aspects (horizontal and vertical) of the sector.

The interviewees also concurred that today’s general macroeconomic environment is vastly different from the economic environment of 2008 when the economy was experiencing the “great recession”. All agreed that construction demand was severely impacted by the great recession and business activity reduced dramatically as evidenced by the amount of “backlog”

of most firms. One interviewee stated the typical approach to valuation of a construction firm is the amount of “book” or “backlog” work. Bidding periods can take up to two years depending on the size, complexity, and owner stipulations that accompany the required request for bid. So lagged factors have a large impact on work performed and the amount of work performed dictates to a great extent the amount of both skilled and unskilled labor required. Several interviewees noted that there were typical construction projects, namely building and infrastructure maintenance and relatively demand inelastic projects such as county school projects, that remained as baseload demand to several interviewee employer firms which kept them solvent during recessionary times.

As a result of the recession economy of 2008 and reduced construction demand, several noted the labor market responded by moving to other geographic markets outside the state of Florida where work was backlogged or already “booked”. This was particularly evidenced by the exodus of trades labor both skilled and unskilled, which comprises the majority of the total number of construction jobs. Given the lack of available jobs during the years of the great recession, trades labor mobilized to areas around the country or even outside the country where construction demand still existed in some form and therefore demand for trades labor existed. Several interviewees stated that this exodus of 2008 had a direct bearing on the lack of available labor exhibited in today’s 2018 labor market. Most interviewees noted they were competing for labor in both the skilled and unskilled categories.

III.2.5.1.2 Industry Future Trends

A general consensus existed among interviewee participants that future technology trends in the construction sector might take many forms, however the impact to the amount of, and skills of needed labor would be little impacted on the 3-5 year horizon given the non-routine

nature of the work performed by most employers represented in this study. The current situation of excessive demand relative to current capacity, also contributed to the general prediction of persistent labor shortages for the foreseeable future.

Although the majority of participants shared this view, it did not preclude discussions regarding new frontiers within the sector currently in progress. As a stimulant to discussion regarding such industry developments, a selected portion of the McKinsey & Company Global Institute's article: "Reinventing Construction: A route to higher productivity" (2017) is depicted below in Table 6 where future developments by this consulting group are bulleted and were reviewed with participants for their reaction and views.

The main thrust of this article posited that the construction sector was a lagging industry when it came to adoption of technology. The recommendation of this study was for the sector to adopt technology which would result in a substantial unlock of increased productivity, in turn creating an increase in sector capacity to deliver on increasing world-wide demand.

Reactions by interview participants were mixed in regard to the technology frontiers posited by the McKinsey group. Although the interview participants readily recognized current limits to the sector's capacity to satisfy construction demand in the state of Florida, they were not ready to embrace the position that technology in the forms suggested by McKinsey would create the capacity unlock that McKinsey suggested.

Specifically, when referencing the table below, of the eleven general categories of technology advances or frontiers available to the sector, at least two were considered already or nearly in full effect and another five partially adopted in some form. During this discussion, several interviewee participants noted that technology is not like an on/off switch. Instead there is an adoption process that occurs based on the availability, reliability, and implementation of

technology that reveals itself in the sector. The question is seldom an all or nothing proposition. For instance, at least one interviewee noted that although BIM is a three-dimensional (3D) Building Information Modeling system, designed to create the ability to identify system conflicts prior to field installation (for instance, the sprinkler system interferes with the HVAC system), such conflicts can be identified at the desk of the project manager via the software. However, “there have never been so many field changes than ever before”, why? Because it is so easy to change a door from here to there and send the information to the field to handle, meanwhile the field has installation in progress and is required to adjust.” Such repercussions are consequential inefficiencies stemming from the use of technology that diminishes the ultimate productivity benefits it is designed to deliver.

Table 6: Construction Sector: Technology Frontiers McKinsey Global Institute 2017

Construction Sector			
Technology Frontiers			
Technology *	Description	Implementation among Interviewee Participants	
→ BIM	3D Building Information Modeling	Active in Field	
→ Digital Collaboration Tools	I-pad, Email	Active I Field	
→ Drones/Unmanned vehicles	For scanning, monitoring, mapping	Inactive	
→ Robotic Automation	Bricklaying, Tileing robots	Inactive	
→ BIM	5D integrated design, costing, progress visualization	Inactive	
→ IoT	Internet of Things	Partial	
	on site monitoring of material, labor and productivity	Time tracking in field, material replenishment	
→ Construction Management	Mobile device apps	Partial	
		field drawings, change orders	
→ Cloud Computing	Real time data both completed, planned and predictive	Partial	
		Cloud used for data mangement	
→ Material Innovation	Precast walls	Partial	
		driven by manufacturing supplier	
→ Prefabrication	Off-site manufacturing and single step install	Partial	
		some on-site prefabrication, kiting	
→ Holistic Process Management	Process management vs. incremental process management	Inactive	
* McKinsey Global Institute (2017)			

III.2.5.2 Microeconomic Employer Specific Themes

Content analysis in this section will be broken down into emergent themes arising from interview participant responses. Conversation specific to the employer workforce, necessarily began with a review of the organizational structure and composition of the workforce defined by labor's respective roles and responsibilities within the context of what the employer delivered in

terms of products or services. Below is a table to assist in understanding how employer interviewees made references to their labor force and the nature of their work.

Table 7: Construction Sector: Labor Force Categories

Employer Labor Force Categories			
Construction Sector			
Typical Occupational Titles		General Roles/Responsibilities	
Office			
Salaried		Departmental Roles	Construction Mgr, Project Mgr., Sales, Design, Marketing
Hourly		Administrative Roles	Office Admin, Accounting payables
Field			
Trades	Skilled	Electrical, HVAC, Plumbing	
	Semi-Skilled	Carpentry, Concrete	
	Unskilled	Laborer, Painter	
Supervision		Field Superintendent	Supervisor of crew and interface with Project Manager

Distinct viewpoints emerged depending on the type of labor being discussed. Typical references to labor were seldom generalized to the entire workforce, unless company cultural topics were being discussed.

Again referencing the mind map in Figure 8 , three main categories of feedback specific to the employer were identified: Company Culture, Company Operating Strategies and Company Labor Strategies. In this section a deep dive into labor strategies content will be analyzed as feedback relates to the above-mentioned labor force classifications. The table below offers a visual of the approach to content analysis of this section, with green indicators for those labor classifications which will be analyzed. Those with red indicators were not part of the interview or lacked relevance to the research purpose.

Table 8: Employer Interview Feedback: Target Labor Categories

Employer Interviewee Results						
Content Analysis Themes						
	Labor Strategies	Recruitment Skills Req.			Employee Growth & Development	Post Secondary Alliances, Connections
		Soft	Technical			
Office						
	Hourly	■	■	■	■	
	Salaried	■	■	■	■	
Field						
	Trades	■	■	■	■	
	Supervision	■	■	■	■	■

Labor strategies in all cases were developed by the employer participant as a response to company needs to provide products and/or services to demands in the construction sector as defined by customer requirements. Labor strategy topics in the interview covered issues related to:

- 1) Labor Structure and Role Functions - Internal determinations of skills needed
 - a. Technical Skills
 - b. People Skills
- 2) Recruitment- both salaried and trades
 - a. Internal
 - b. External (Post-Secondary Alliances / Interns)
- 3) Retention- both salaried and trades
 - a. Growth and Development Opportunities
 - b. Policies and Benefits (Tuition Reimbursement)

A closer look into strategies regarding definition of roles and skills reveals a typical organizational structure across participating employers where field roles are employees of trades

(both skilled and unskilled) as well as supervision in all forms of the trades crews. Those roles primarily residing in the office were administrative, generally comprised of support functions such as accounting, information services, human resources, executives and other managerial roles. Several roles were expected to straddle both field and office operations and such roles were likely to be Sales, Operations, and Project Management.

When asked about skill requirements of labor the feedback was provided for the two major employee categories: trades and salaried. Each labor category (trades/salaried) will be discussed separately regarding the labor strategy topics outlined above.

III.2.5.2.1 Trades: Skill Requirements / Internal Growth & Development / Alliances

Of the twelve employer participants, five participants were considered “self-perform” trades employers. The remaining participants were mostly General Contractors who did not directly hire or manage individuals performing trades work. Throughout the analysis of trades labor topics, a greater emphasis is placed on the feedback from “self-perform” trades employers.

In all cases, interviewees concurred that the availability of skilled trades labor was nearly nonexistent in the central Florida area. Technical skills related to electrical, HVAC, and plumbing were by necessity being taught on the job. Employers noted they would typically hire from the general labor pool available through job fairs, Career Source, and other placement outlets. If general labor (Laborers) once hired exhibited the desire to further their technical skills the employer was willing to accommodate via a mentoring process with others on the job. It was noted by several participants that this approach to on the job training was the best way to achieve a standard of performance that an employer expected. Additionally, the employer would, as in the case of electricians, sponsor the employee to attain a license via Florida Electrical Apprenticeship & Training (FEAT), a technical school recognized in the state of Florida. In the

electrical area, several of the interviewee participants had current employees connected in some way to FEAT, either administratively or as an instructor. Typically, the employee would attend FEAT training on their own time, but the employer would pay for the tuition and training materials. In the case of HVAC where technical advances of the units, as well as maintenance services of existing units required HVAC technicians to be conversant across a wide spectrum of possibilities. Instead of an alliance with a post-secondary institution, employers instead created alliances with specific manufactures or suppliers. These organizations have a vested interest in training field operations/technicians on the installation and maintenance of their equipment. This strategy is also used with some software utilization by trades employers. Where there is time and material programs to assist in project management software suppliers are relied upon to train current employees on the use of their products.

One quote that best reflects the sentiment of trades self-perform interviewees was, “80% of the job is company culture, we’ll teach the other 20%”. Showing up to work and willingness to learn is the biggest hurdle of trades employer labor issues. The labor market is so tight that issuance of disciplinary points for lack of attendance, does not impact the labor, given the individual merely finds another job immediately at the placement agency. Therefore, employers feel hamstringing in accepting less than capable trades labor and as a result are willing to invest in both internal on-the-job training as well as either training with suppliers or certificate post-secondary schools as long as the employee exhibits the work ethic and willingness to engage in this skill development.

III.2.5.2.2 Salaried: Skill Requirements / Internal Growth & Development / Alliances

Where employers of trades personnel were most interested in technical skills, in the case of salaried employees, both technical and people skills were discussed as a necessity for job

performance success. The interview participant views regarding the relative importance of technical skills versus soft skills is demonstrated best by their respective recruitment strategies.

Technical Skills:

An overview of technical skills feedback reveals that for salaried employees the majority of employers preferred *but did not require* a 4-year college degree. The more technical the role, the more the employer had the desire for the 4-year degree. For example, a Project Engineer required a 4-year degree, but for a Project Manager role a 4-year degree would be desired but not required. Technical skills were typically referred to by participants as either engineering skills, or possibly information technology skills and accounting skills. However in several instances, employers referred to internal promotions within both IT and Accounting after on the job experience by an employee resulted in necessary attainment of the desired skill level to prompt internal promotion or reassignment.

Within the sector, it appeared a high level of respect is conferred to those who have been internally promoted over time based on actual job performance. This attitude is best demonstrated by the interview participants themselves. Of the twelve (12) interview participants, five (5) possessed a Bachelor's degree (not necessarily in a field of study related to construction), two (2) possessed a Master's level degree, four (4) had a high school diploma, and one participant's education level was unknown. Most participants (10 of 12) were executive level directors or even owners of their organization and two were at manager level within their organization.

Most participants agreed that post-secondary education might have a bearing at the onset of the hiring process, although participants reported that progression within the company was clearly dependent on work ethic, attitude and actual job performance over time. Again, the

revealing quote that 80% of the job was related to compatibility with company culture as opposed to formal or specific technical skill, appeared evidenced by participant post-secondary credentials and their attitude about internal promotion. Virtually all participants recognize that company specific training is a must for a new hire.

Three interview participants explained the importance of protecting the company culture and how this company characteristic was an important feature when submitting quotes for jobs under consideration by prospective customers. In an effort to create competitive distinction and advantage, participants cite past actual work performed and point to this work as evidence their personnel are capable and qualified to perform upcoming work similar in nature. In addition, the company cites current work processes and methods and quality standards to distinguish themselves among the competitive field.

Therefore, to protect the culture that is used to distinguish its ability to compete, the employer considers it an imperative to indoctrinate new employees to those methods and practices crucial to performance. In several participants view this made on the job training and the new employee's acceptance of it (regardless of educational status) a fundamental element in the new hire process.

Most participants called this an "internal training process" and utilized internal mentors to accomplish this aspect of on the job training and cultural indoctrination. Participants recognized if done correctly this was a significant investment of time. This was emphasized to a greater degree by those employers who did not embrace interns as a recruitment strategy. This attitude also reinforces the greater reliance on internal promotion to fill pivotal positions. Several participants believed such training might extend over the course of twelve (12) months so the new hire has an opportunity to experience the entire year long cycle of activity.

One particular interview participant conveyed his view of technical skills of recent graduates from 4-year post-secondary institutions the following way:

“...the college people that we hire (management), all our project managers are all civil engineers. I hire them right out of school and train them. I stick them in a year training program and don't even let them touch a client, or I stick them out in the field for six months. First thing I'd do is take them out in the field, just so that they know how hot, dirty and miserable it is out there. ... because the problem, they come out of college as a construction engineer, they think they know..., and they don't....”

People/Soft Skills:

Most interviewee participants noted that the introduction of technology, in particular use of email, use of iPads, and Building Information Modeling (BIM) systems, has led to a reduction of direct person to person interaction and a lack of practical use of soft skills. The reduction of direct two-way conversation with the traditional feedback loops has led to misunderstandings and inefficient repetitive actions as noted in an earlier reference.

Although this technology is with us as fully ingrained and is recognized to offer advantages that far outweigh the interpersonal drawbacks associated with its use, interview participants noted several pivotal high impact roles where soft skills and communication in particular were imperative to success.

All participants cited the Field Superintendent role as a key role in performance of work given the strong technical knowledge required of this individual's responsibility in managing crews of various trades, as well as acting as intermediary between field activities and project managers/ project engineers and design demands. The Superintendent must possess the people skills to be able to direct large numbers of individuals as well as manage employee relations

issues that arise in this role. Invariably, interview participants noted this position was a fulcrum in the organization and nearly all participants noted their incumbent Superintendents were the result of internal promotions from field operations. Participants recognize that internal promotion for the Superintendent position results in immediate respect from field crews given candidates are typically tenured, stable employees. None were touted to possess post-secondary education. In only one instance, an interviewee participant had an intern from a post-secondary institution learning field operations in this capacity.

Although the coding of participant feedback indicates that Soft Skills were referenced by six (6) of the twelve (12) participants specifically as such, it should be noted that every participant referenced the importance of company culture to company success and its dependence on employee behavior. The particular soft skills discussed and the number of participants who referenced these skills include (in alphabetical order):

- 1) Common Sense (6)
- 2) Communication (9)
- 3) Critical Thinking (3)
- 4) Integrity (2)
- 5) Leadership (1)
- 6) Quality of Work (3)
- 7) Work Ethic (12)

All participants made reference to work ethic and one participant offered an explanation why he felt this topic was uniquely important to the construction sector:

“You put them out in the field, you make them work in the heat. If it's a 1:00 am (job), you better (be) out there at midnight and you're going to work probably till four or five the next afternoon. ...because they need to understand that the people out in the field aren't machines, that you can literally work them to death in the heat and they need to

understand the sequence of things, they just need to understand what it is they're managing....sometimes they quit.”

Multiple participants, but not all lamented at the general lack of soft skills exhibited by current graduates whom were referred to as millennials. The participants appreciated that this group has had a different and more intense experience with technology in their growth development. Participants in general advanced the notion that post-secondary institutions should do more to emphasize the importance of the soft skills cited above, particularly work ethic attributes and communication.

Post-Secondary Alliances and Recruiting Strategies:

The interviewee participant summary attribute sheet contains a column which indicates which participants had what they considered to be “alliances” with post-secondary institutions. In only one case did a participant claim to have proactively created an alliance with a post-secondary institution for the purpose of impacting course content. In doing so that participant was intent to impact current research related to the participants business activities. That participant was not motivated to have this relationship for the purpose of becoming an ultimate employer of graduates who may possess specific skills the employer desired. Most all participants had relationships with post-secondary institutions for the purposes of recruitment and to gain access to upcoming graduates, or in some cases to employ interns for summer projects, for the ultimate goal of future employability of that intern.

Two 4 year institutions were cited as having a curriculum specifically designed for construction management University of Florida - Rinker School, and Seminole State BS-Construction. Of the twelve (12) participants, two (2) individuals had direct experience with the University of Florida in program in construction management. Although most participants had

knowledge of these programs and several recruited at these schools, participants in general did not place greater value on graduates or interns from these institutions. Several participants had recruiting strategies outside of the state of Florida for the express purpose of gaining access to graduates whom they deemed to exhibit preferred work ethic. In their view, specific curriculums did not provide a distinguishing competitive advantage for a particular institution, instead the work ethic or perception of work ethic of the graduates did.

Participants had mixed views as to the use of interns from post-secondary institutions (either 2 year ,or 4 year). A little over half of the participants found interns a good way to augment the recruitment process. Interns typically work several months over a given summer on an assigned project by the employer, however in at least one instance the intern was close enough geographically to work concurrently while attending post-secondary studies. Internships provide candidates on the job experience and afford the employer a closer look at the candidates work ethic and performance in order to confirm a good fit is possible between both. Those employers who pursued interns with this in mind selected interns with the idea that a job offer would be likely be extended in most cases.

About a third of the participants did not actively pursue internships as an extension of company recruitment. Instead they felt the limited time attached to internship and lack of substantive work as well as risk of loss of investment if the candidate took another offer upon graduation did not warrant the investment in time and effort. These participants again relied heavily on internal promotions and recruitment from institutions that they felt emphasized work ethic and soft skills with graduates.

The interview participant content analysis results lead to the following conclusions regarding the original hypothesis for this stakeholder.

H1:

Candidates with higher levels of post-secondary education display more comprehensive skill set inclusive of both technical job specific knowledge, as well as skills and abilities (analytic and interactive) than those job candidates who do not attend post-secondary education.

This hypothesis was not confirmed by participant feedback in the interviews. Although there was a reliance on post-secondary education relating to technical skills required for selected salaried positions, this was by no means a hard and fast rule. The respondents instead demonstrated a strong preference for internal promotion based on actual job experience and individual work ethic behaviors aligned with company culture principles.

H2:

Employers who interact with post-secondary institutions to influence curriculum content are more satisfied with job candidate skills, which result in a better overall job requirement match. (retention or number recruited)

The feedback from participants did not support this hypothesis. As the content analysis illustrated, connections by these employers with post-secondary institutions were for the purposes of either influencing research, or to gain access to upcoming graduates for recruitment purposes. Again, an emphasis was placed on work ethic behaviors and this view drove the desire to recruit for graduates at post-secondary institutions located outside the state.

III.3 Stage 3: The Government Stakeholder Method, Analysis & Results

We now turn our attention to the Government as stakeholder. The federal government as stakeholder has a two-fold interest in post-secondary education. To the extent the populace is educated in skills required by employers, the greater the employment rate. The greater the employment rate, the greater total economic output of the economy or GDP. Consequently, if

more of the populace is employed, and if that employment occurs at higher lifetime earnings levels, *assuming employer demand exists for these higher levels of skills*, the higher earnings translate into a higher tax base and higher revenue streams to the government. In addition to higher employment as a direct result of skills desired by employers, a cascading or multiplier effect occurs when increased employment increases economic activity. More individuals employed and earnings at higher wages results in increased overall demand that stems from this demand stimulus. Our focus will be on the direct result of increased revenue streams from higher earnings and will not address multiplier possibilities.

III.3.1 *Question and Hypothesis*

It is in our best interest both collectively and individually that the total economy achieve as close as possible its full potential. Such potential is manifest by use of available resources at their maximum value and most efficient capacity. As noted earlier, human capital is no small part of that equation. Therefore, full potential requires the labor market achieve its full earning potential by being employed in the highest valued positions available. This condition not only can increase the welfare of the individual, higher earnings by labor will also maximize the tax receipts from these constituents.

The government has an interest in labor seeking to be trained in skills yielding high earning employment. Below is a simple model which depicts these relationships accompanied by the two hypotheses tested.

Personal
Income Tax



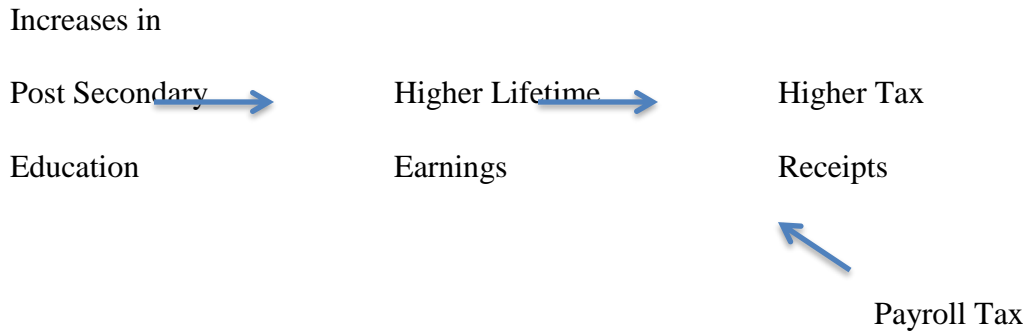


Figure 9: Government Stakeholder Impact Model

H1:

As wage earners in the labor pool attain more post-secondary education, they are more likely to achieve higher lifetime earnings resulting in higher payroll and income tax revenues to the federal government.

H2:

Increased payroll and income tax revenue streams to the federal government realized from higher lifetime earnings as a result of attainment of post-secondary education can offset costs associated with post-secondary education attendance and cost justify a revised public policy regarding voluntary post-secondary college attendance.

III.3.2 Method

With an understanding that each state has its own unique tax structure which funds both state and local governments, the scope of this section is concerned with quantifiable impacts at the federal level only. Specific focus is on the return on investment if the federal government were to consider federally funding 4 yr. post-secondary education for those high school graduates who wish to attend, assuming no other eligibility requirements. Calculations are made of incremental revenues from both personal income tax and payroll tax as the “payback” to such a policy. Given that both streams together comprise in excess of 80% of all revenues to the

federal government (Center on Budget and Policy Priorities 2016), a line of sight of actual direct impact of such a policy is feasible.

III.3.3 Data Sources

Federal Tax Revenues streams have been identified in Figure 9 using the Center on Budget and Policy Priorities as a source for 2016 data. The section that is given the most attention for the purposes of this paper are revenues to the federal government from individuals. The table indicates some 81% of total federal revenues stems from individual income tax (47%) and individual payroll taxes (34%).

Personal Income and Payroll Tax Brackets: 2016 [IRS Website](#), and 2016 tables located at the Social Security Administration website ([SSA.gov](#)) respectively have been used to calculate proforma tax flows. These rates will be applied against earnings differentials calculated in the student stakeholder section calculated for each occupation by age bracket.

**Table 9: 2016 Tax Tables IRS.gov 2016 Payroll Tax Tables SSA.gov
Single**

Taxable Income	Tax Rate
\$0—\$9,275	10%
\$9,276—\$37,650	\$927.50 plus 15% of the amount over \$9,275
\$37,651—\$91,150	\$5,183.75 plus 25% of the amount over \$37,650
\$91,151—\$190,150	\$18,558.75 plus 28% of the amount over \$91,150
\$190,151—\$ 413,350	\$46,278.75 plus 33% of the amount over \$190,150
\$413,351—\$415,050	\$119,934.75 plus 35% of the amount over \$413,350
\$415,051 or more	\$120,529.75 plus 39.6% of the amount over \$415,050

Old-Age, Survivors, and Disability Insurance (OASDI)	2016
Tax Rates (percent)	
Social Security (Old-Age, Survivors, and Disability Insurance)	
Employers and Employees, each ^a	6.20
Medicare (Hospital Insurance)	
Employers and Employees, each ^{a,b}	1.45
Maximum Taxable Earnings (dollars)	
Social Security	118,500
Medicare (Hospital Insurance)	No limit

III.3.4 Variables

The earnings data from the Florida construction sector and differentials associated with various educational attainment levels, and occupations will act as the foundation for this analysis. The worksheet for each occupation and median earnings by age bracket will account for earning variations one experiences over the course of a career in a chosen occupation.

Projected tax revenues will be calculated by age bracket within each of the major eighteen (18) occupations based on two categories: High School diploma vs. 4-yr. bachelor's degree. Tax tables, both personal and payroll for 2016 are found in Table 9 and were sourced from the IRS and SSA respectively. These tables have been utilized to create calculations sheets for pro forma revenue flows by occupation, education attainment level, and age bracket.

Tax Revenue Streams have been calculated with a base case assumption to allow for direct comparison by occupation. The base case assumes, an individual files tax returns as a "single" filer, having one personal exemption of \$4050, and one standard deduction of \$6300. These values are subtracted from median earnings by age bracket to reach taxable income levels from which tax computations (both personal and payroll) are made.

Costs for 4-yr. post-secondary education have been calculated based on data derived for the four (4) major universities within the state of Florida (Appendix A, Exhibit 3) by taking a

simple average of the “list” price across all universities. Costs for tuition and books/supplies will be considered the funded expenses under the assumed “free tuition” federal policy. It is assumed each individual will bear the responsibility for additional personal expenses, such as room and board, to attend a 4-yr. post-secondary institution. These data points for both costs (over a 4-year horizon) and revenues (over a forty year horizon) have been used to calculate the “net present value” for an individual, by occupation at an assumed discount rate of 3%.

Research performed by the Upjohn Institute concerning the Michigan “Kalamazoo Promise” Bartik, Hershbein, & Lachowska (2105)) offers important insights as to possible outcomes if a similar federal policy were to be considered and implemented. The “Kalamazoo Promise” initiated in 2006 offers high school students paid tuition for post-secondary education both 2yr and 4 yr. and labels itself a “place-based scholarship” Bartik et. al, (2015), meaning that the scholarship eligibility is based on where the student attended primary and secondary school (in Kalamazoo) as opposed to merit based eligibility. Although the eligibility stipulation regarding “place” is not relevant to our stakeholder analysis here, the engagement percentage calculated Bartik, et. al, (2015) as a result of the Kalamazoo Promise has been estimated to have impacted post-secondary enrollment by between 23-34%. In addition, these authors have estimated that successful degree completion increased by nearly the same percentage, 23-33% with the range being dictated by the time horizon of outcome measurement (4 yr. post high school graduation versus 6 year post high school graduation). For the calculations of this stakeholder section 30% has been selected and used both for enrollment which dictates costs, and for degree attainment which dictates earnings differentials and revenue streams.

Net Present values have been calculated by occupation at an individual level and extrapolated to the population using the person weights provided by the US Census for the ACS

data set 2012-2016. This weighting structure provided a picture of total expenditures and total revenue streams for nearly the entire sector (80% of the sector represented by these 18 occupations).

Application of these weights allows a view of total expenditures required to finance post-secondary education in this sector by adding the current population who possess a 4 yr. bachelor's degree with the incremental populations who would enroll (+30% of those currently without a degree) and multiplying this by the cost assumptions described above.

Tax revenue streams would be calculated in total for the incremental revenues which would accrue to the government as a result of this funding. Net present values (NPV) were then calculated on a macro level by occupation based on these assumptions.

Finally, these values have been summarized and placed into categories as outlined in the Occupational Skill Matrix (Appendix A, Exhibit 4). The categories in this matrix have been designed to mirror the category structure proposed by Autor, et.al, (2001) regarding the compositional distinction of future jobs. The final matrix represents the relative benefit to the government stakeholder by the incremental population of individuals who would be projected to attend a post-secondary 4 yr. institution and realized incremental earnings in total, resulting in added incremental tax revenue in total. The magnitude of the present value of the incremental tax revenue over the life-time will be compared to the direct cost of college in order to determine if pursuit of policies which incent higher attendance rates to college are justified on the federal level, meanwhile offering insights into the "category" of jobs valued at relatively differing levels by employers as demonstrated by higher earnings potential and NPV values.

III.3.5 Analysis

Pro forma worksheets have been created for each of the eighteen (18) occupations within the construction sector in accordance with the method and variable definitions defined above. These worksheets can be found in Appendix B, Exhibit 8. These worksheets contain the data input and NPV calculations to obtain both individual NPV values, as well as sector population NPV values based on ACS sample populations weights.

The results from this analysis have been fed into the Occupation Skill Matrix Summary Sheet in Appendix A, Exhibit 4 to assist in comparison across occupations, and allow for viewing within the context of job definition categories designed by Autor et. al, (2001).

III.3.6 Results

The Occupation Skill Matrix Summary sheet contains the information that acts as the basis for comments in this section. The approach taken in this study would suggest that the government would expend in excess of \$2.4 billion in cash outlays to accommodate a population of the size and composition of the construction sector as depicted in the populations weights of the ACS data set. The total NPV calculated in total across all occupations for this expenditure is calculated at \$2.7 billion. These are aggregated numbers weighted by populations weights of a particular occupation. Given a very high NPV value, one is tempted to conclude that policy considerations in favor of funded post-secondary education would be economically viable to all stakeholders.

A closer look into job categories, reveals unequal NPV magnitudes. Of the total NPV value, \$2.1 of the \$2.7 total is attributed to those revenue stream returns to occupations that are mapped to the “non-routine cognitive interactive” category. The total population indicator for the occupations selected is 224,508, for this sector in the state of Florida. Of this number in the

population, 81333 (36%) of the population is mapped into the “non-routine cognitive interactive” category, which indicates a disproportionate share of NPV is attributable to occupations within this category.

A look at the NPV values calculated at the individual level reveals a similar phenomena. Recall in our assumption base case, the individual would be responsible for all costs of post-secondary education and would finance the costs via a 10 year loan. These conditions create circumstances which may indicate a negative NPV for an occupation at an individual level yet indicate a positive NPV at the macro government level. This situation can be seen to exist for example for the “front line supervision” occupation where NPV at the individual level is negative \$28,000 but positive on the government level. In addition, government NPV’s take into consideration the current and anticipated proportion of the population that would avail themselves of a funded opportunity. For these reasons individual and macro government NPV’s are not transmutable. Even so, we see the same pattern reflected at the individual level, where four of the top five individual NPV values relate to occupations that reside in the “non-routine cognitive interactive” category.

The results and interpretation of the Occupation Skill Matrix Summary sheet leads to the following conclusions regarding the original hypothesis for this stakeholder.

H1:

As wage earners in the labor pool attain more post-secondary education, they are more likely to achieve higher lifetime earnings resulting in higher payroll and income tax revenues to the federal government.

Certainly, as earnings rise, tax receipts rise. The occupational tax worksheets in Appendix B, Exhibit 5 attempts to trend earnings differentials over the eight age groups used

consistently throughout this study. Comparing earnings differentials between those individuals with a high school diploma versus those with a bachelor's degree yielded consistently higher differentials over time. (Occupational Skill Matrix Summary Sheet, Appendix A, Exhibit 4, Column J) This leads to higher tax revenue streams.

H2:

Increased payroll and income tax revenue streams to the federal government realized from higher lifetime earnings as a result of attainment of post-secondary education can offset costs associated with post-secondary education attendance and cost justify a revised public policy regarding voluntary post-secondary college attendance.

Although H1 indicates higher earnings are associated with those individuals whom have a 4 yr. bachelor's degree versus those with a high school diploma, it requires the calculations of investment and magnitude of anticipated returns to understand if this relationship is strong enough to justify governmental funding for those who already attain post-secondary bachelor's degree, and those who would wish to attain a post-secondary bachelor's degree if funding were available. Initial calculations in aggregate would confirm this as stated above however a cautionary note is added given the uneven manner in which returns are realized based on occupations within specific category classifications.

IV CHAPTER 4 – DISCUSSION & CONCLUSION

To facilitate a comprehensive discussion of findings in this paper based on the original research question, a short summary with findings will be presented for each stakeholder, along with limitations noted for that stakeholder section and suggested follow up research. A final section will integrate all stakeholder findings to the extent possible for final conclusions.

IV.1 Student Stakeholder Discussion

Sample data used in this paper's analysis would indicate that returns as indicated by sample earnings data differentials as well as NPV calculations associated with post-secondary education are positive in aggregate. The robustness of this finding however is questionable given the lack of statistical clarity regarding the causal relationship between education and earnings. Although positive correlations exist, at some point experience appears to supersede post-secondary education as a relevant factor in determining earnings. A total reliance on NPV values as an indication of the positive returns of investment should be tempered given the disparity that has been observed dependent upon occupations. It appears particularly important to consider occupations within the context of job categories. Many decision tools exist to assist the student stakeholder in determining the desired direction of career choices so as to formulate individualized post-secondary education costs and earnings returns.

Limitations in this section include the use of one sector's earnings information to determine returns on investment in general. The construction sector although believed to be an important industry sector connected to our economy's future growth and development has special working environment conditions which may impact the ability to generalize results. In addition, assumptions made regarding the student base case can have a bearing on costs and loan

calculations. Again, many tools exist that allow prospective students to customize parameters based on their own circumstances which may or may not impact outcomes.

Recommendations for future research includes a focus on field of study relevancy. Adding this variable to the factor analysis, correlations, and added as an independent variable in linear regression may assist in creating more statistical significance to better understand the causal relationship between of post-secondary education and lifetime earnings.

IV.2 Employer Stakeholder Discussion

Employer interviews generally indicated that post-secondary curriculums were not as relevant as believed at the onset of this study. If specific curriculum skills are desired based on technical needs, few employers cited any four-year institution as distinguished in the quality of skills imparted on their graduates. Although technology was driving operational methods and material changes within the industry, it was not driving a need from employers for post-secondary curriculum changes beyond the processes currently in place. Employers expressed a reliance on soft or people skills from those whom graduate from post-secondary institutions. Employers found technical training could be achieved with specific trades certificates, or through supplier training and support modules in the case of trades. All employers without exception dedicated significant resources to internal training.

If employers believe post-secondary institutions do not deliver special skills and prefer to promote from within based on experience and performance, one may question why then employers expend the time and resources to recruit graduates from post-secondary institutions, which is the case for salaried personnel who have job occupations in the “non-routine cognitive interactive category”. One could surmise that recruitment activity supports the rationale that

social maturity is achieved with post-secondary education as with an emphasis on soft skills and work ethic behavior preferences one would expect from a college graduate.

Limitations in this section are twofold. The employer attribute table (Appendix A, Exhibit 5) reveals that all employers with the exception of two are privately owned entities. Most were relatively small with an employee base in all but one case below 500 employees. We must consider that employer interview feedback was not representative of the industry at large, and instead represented the particular stratification based on attributes. Secondly, as with all qualitative research, the voluntary nature of participation imparts an inherent participation bias, distinct from those who would not consider participation, again bringing into question the generalizability of feedback results.

Suggested Research: Future research for this stakeholder may include a deeper probe into soft skill requirements employers desire from post-secondary graduates. Although advisory councils exist as a means for post-secondary institutions to receive private sector feedback, typical discussions are narrowly focused on the latest software packages or modeling techniques. Although these discussions are important, considerations should be made to expand them. Survey results from those participants both in and out of these alliance meetings is a method that could be used to ensure quality outcomes. In addition, survey feedback from recent graduates could be incorporated into agenda items.

IV.3 Government Stakeholder Discussion

The net present value (NPV) calculations made in this section indicates a positive and significant return on investment if the federal government would consider funding tuition for post-secondary education on a voluntary basis. Although this alone would appear to satisfy our inquiry a further look is required to consider that only tuition and books/supply costs were used

for cost calculations. The student would still be required to finance their room and board and personal expenses. When cost tables are reviewed closely, these expenses are over half the total expenses when calculated with the post-secondary net calculator. Even though we have evidence from the “Kalamazoo Promise” that enrollment would likely increase somewhere between 24-32% as a result of free tuition, accessibility by students would continue to be a factor.

It is also important to note that in our base case cost analysis for a student, each net cost calculator for the base case provided a “grant”, or free funds offered with no repayment required. These funds averaged across the four universities at \$4370 annually, or 65% of the annual cost (\$6813) used to calculate costs for federal funding. One could surmise we are already experiencing free funding dictated by base case eligibility parameters.

Limitations: As in the student stakeholder section, caution should be used when viewing these results as representative given the sample industry sector and geographic stipulations used for the sample.

Suggested future research: An in-depth study to understand accessibility would be useful to discover root cause as to why more prospective students don’t take advantage of current funding grants to attend post-secondary institutions. It is possible that government funding would not have the desired result if other conditions exist precluding enrollment.

IV.4 General Conclusion:

In our current culture of “more is better”, this paper seeks to understand if this cultural norm also applies to education.

The findings in this paper would indicate ...”it depends.” In aggregate it is tempting to answer this question in the positive, yet analysis of occupational differentials and scrutinizing them within the context of job task categories (Autor et. al.)

assists in setting expectations regarding the NPV return on investment for attaining a post-secondary education.

Beyond the mathematical calculations involved to arrive at NPV, employer feedback gives us pause to consider what skills and attitudes they truly require for an employee to be successful within their workforce. What has not been answered with certainty is whether those who attain a post-secondary bachelor's degree send a "signal" to prospective employers as opposed to having a skill that satisfies a legitimate employer need.

Limitations: For the purposes of this study there was an ad hoc assignment of occupations into categories designed by Autor. As a practical matter, overlapping of categories certainly exists as job descriptions vary, and would rarely fit neatly into one of the four five categories defined.

Suggested research: As a remedy to the limitation noted above, a thorough review of current job descriptions versus the category design by Autor et. al, with allowances for overlapping should be conducted with more rigor. Actual job descriptions are readily available via internet job sites that could facilitate this.

Final thoughts:

Employer interviews revealed a surprising insight to the writer. Post-secondary education is a very personal matter. The decision and cost can be reduced to statistics and return on investment calculations, but the decision to go to college and where to go to college defines for some one's very identity. In every case, the employer interview participant revealed either their own post-secondary education background, and/or they relayed their actual experiences with their children regarding this topic, or their intent regarding their children's future prospects in this area. Their views were not consistent. Several participants conveyed disappointment with the

education their children received versus skills they were currently using in the workforce, and the high cost of such a mismatch of endeavor and result. Some were seemingly satisfied with the result from their children's endeavors. Some underscored the advances they themselves had made within the firm without formal post-secondary education that others presume is necessary.

Even so, several participants admitted that acquiring post-secondary education is closely aligned with pursuit of the American dream where all possibilities are open to those who are willing to work for them, and parents work to provide a lifestyle better than their own.

This association brands the decision to attend college, not just a function of a mathematical equation, but on some level an emotional decision. For some but not all. also, In true American form this decision is not hard and fast. It seems now more than ever, challenges are being made to the preconceived notion, that more in better in the realm of higher education.

Arguably one of the richest man in the world is Jeff Bezos. You may know he is getting a divorce. Do you know where he went to school? Did he go to school? What was his field of study? How important was this to his financial success?

(PS the answer can be found at the bottom right of the "college comparison cost build up summary sheet" Appendix A, Exhibit 3)

APPENDICES

Appendix A: Summary and Comparative Documents

Exhibit 1: Occupational Analysis Summary Sheet

Occupation	Lifetime Earnings by Educational Attainment Level							Descriptive Statistics								
	Number of Respondents	(million \$)						Correlation		Kruskal-Wallis		Linear Regression				
		<H.S.	HS Diploma	Some College	Assoc	Bachelor's	Master's+	Spearman rho	Signif.	Chi-Square	Signif.	Adj. R Sq.	Std Beta		Std Beta	Signif.
		No Dip	2 yr degree	Degree	Prof, PhD	EDU	AGE									
(sml=red, med= yell)																
All Industry excl Construction	147,051	1.2	1.4	1.7	1.8	2.6	3.6	0.450	0.000	30917	0.000	0.156	0.368	0.000	0.164	0.000
All Construction	13,108	1.3	1.6	1.8	1.8	2.5	3.0	0.330	0.000	1576	0.000	0.104	0.277	0.000	0.154	0.000
Construction Laborers	1532	1.2	1.3	1.5	1.5	1.6	1.7	0.198	0.000	65.45	0.000	0.045	0.155	0.000	0.130	0.000
First Line Supervision	1256	1.7	2.0	2.1	2.1	2.2	3.0	0.128	0.000	30.23	0.000	0.043	0.133	0.000	0.167	0.000
Construction Manager	1247	2.2	2.3	2.4	2.5	3	3.5	0.197	0.000	56.93	0.000	0.063	0.213	0.000	0.173	0.000
Carpenters	940	1.2	1.4	1.6	1.6	1.6	1.3	0.149	0.000	28.587	0.000	0.011	0.091	0.005	0.059	0.070
Misc. Managers	833	1.9	2.2	2.2	2.3	3.1	4.5	0.289	0.000	85.451	0.000	0.075	0.237	0.000	0.141	0.000
Electricians	771	1.3	1.5	1.6	1.6	2.3	--	0.126	0.000	14.936	0.005	0.035	0.124	0.000	0.154	0.000
Chief Exec & Legislatures	342	2.3	2.7	3.2	3.7	4	5.6	0.330	0.000	42.669	0.000	0.078	0.253	0.000	0.143	0.006
HVAC	587	1.6	1.7	1.7	1.8	1.7	--	0.072	0.084	6.734	0.151	0.022	0.031	0.457	0.155	0.000
Pipelayer, Plumber	573	1.3	1.6	1.7	1.6	1.8	--	0.179	0.000	30.945	0.000	0.026	0.095	0.022	0.142	0.001
Paperhangers, Painters	456	1.1	1.4	1.2	1.1	1.6	--	0.116	0.013	18.406	0.001	0.021	0.011	0.821	0.160	0.001
OFF Sec & Admin Asst	383	1.7	1.3	1.4	1.4	1.5	2.1	0.115	0.024	6.395	0.270	0.046	0.146	0.004	0.194	0.000
Eqmt Op excl. Paving	276	1.5	1.5	1.6	--	--	--	0.091	0.142	5.412	0.067	0.013	0.027	0.662	0.141	0.022
Drivers, Sales & Truck	243	1.6	1.4	1.3	1.5	--	--	-0.182	0.005	8.624	0.035	0.002	-0.091	0.164	0.045	0.485
Roofer	223	1.2	1.4	1.3	1.6	--	--	0.211	0.002	9.903	0.019	0.006	0.043	0.530	-0.037	0.591
Sales Reps	191	--	1.8	2.4	2.3	3.4	3.5	0.295	0.000	21.75	0.000	0.031	0.197	0.007	0.085	0.236
Cost Estimators (const only)	183	3.4	1.9	2.7	2.4	3.3	2.3	0.224	0.002	21.667	0.001	0.064	0.192	0.009	0.231	0.002
Cost Estimators (ALL ind)	267	2.5	1.9	2.3	2.3	3.0	2.3	0.185	0.002	16.516	0.006	0.024	0.162	0.009	0.109	0.077
Bkkping, Acctg & Audit (const only)	143	--	1.4	1.6	1.8	1.7	--	0.113	0.178	3.335	0.343	0.001	0.072	0.395	0.108	0.203
Bkkping, Acctg & Audit (ALL ind)	1776	1.3	1.4	1.5	1.5	1.5	2.1	0.105	0.000	31.913	0.000	0.033	0.149	0.000	0.134	0.000
Mgr. Gen & Operations(const only)	118	--	3.1	2.7	2.5	5.0	6.4	0.26	0.004	18.003	0.003	0.119	0.306	0.001	0.265	0.003
Mgr. Gen & Operations(ALL ind)	2121	2.2	2.4	2.6	2.6	3.3	4.4	0.292	0.000	191.587	0.000	0.102	0.254	0.000	0.216	0.000

Exhibit 2: “College Payoff” Comparison Summary Sheet

Comparison Template							
ACS 2012-2016 (2016 constant \$) vs. College Payoff (revised to 2016 Constant \$)							
							Highlight deviation over 20%
							Highlight disparity of data availability
Lifetime Earnings by Educational Attainment Level							
Occupation	Number of Respondents	(million \$)					
		<H.S.	HS Diploma	Some College No Dip	Assoc 2 yr degree	Bachelor's Degree	Master's+ Prof, PhD
Construction Laborers	1,532	1.2	1.3	1.5	1.5	1.6	1.7
Payoff in 2016\$\$		1.1	1.3	1.5	1.5	1.5	--
First Line Supervision	1,256	1.7	2.0	2.1	2.1	2.2	3.0
Payoff		1.9	2.2	2.5	2.5	2.6	--
Construction Manager	1,247	2.2	2.3	2.4	2.5	3.0	3.5
Payoff		1.7	2.2	2.6	2.6	3.5	4.0
Carpenters	940	1.2	1.4	1.6	1.6	1.6	1.3
Payoff		1.2	1.5	1.3	1.3	1.2	--
Misc. Managers	833	1.9	2.2	2.2	2.3	3.1	4.5
Payoff		1.6	2.1	2.5	2.6	3.6	4.3
Electricians	771	1.3	1.5	1.6	1.6	2.3	--
Payoff		1.6	2.0	2.2	2.3	2.0	--
Chief Exec & Legislatures	342	2.3	2.7	3.2	3.7	4	5.6
Payoff		--	2.9	3.6	3.4	5	5.7
HVAC	587	1.6	1.7	1.7	1.8	1.7	--
Payoff		--	1.8	2.0	2.0	--	--
Pipelayer, Plumber	573	1.3	1.6	1.7	1.6	1.8	--
Payoff		1.5	1.9	2.1	2.3	--	--
Paperhangers, Painters	456	1.1	1.4	1.2	1.1	1.6	--
Payoff		1.0	1.2	1.1	--	--	--
OFF Sec & Admin Asst	383	1.7	1.3	1.4	1.4	1.5	2.1
Payoff		1.2	1.5	1.5	1.6	1.7	1.8
Eqmt Op excl. Paving	276	1.5	1.5	1.6	--	--	--
Payoff		1.6	1.8	2.0	--	--	--
Drivers, Sales & Truck	243	1.6	1.4	1.3	1.5	--	--
Payoff		1.5	1.7	1.8	1.7	1.7	--
Roofer	223	1.2	1.4	1.3	1.6	--	--
Payoff		1.1	1.3	--	--	--	--
Sales Reps	191	--	1.8	2.4	2.3	3.4	3.5
Payoff		--	2.0	2.2	2.2	3.2	4.1
Cost Estimators (CON)	183	3.4	1.9	2.7	2.4	3.3	2.3
Cost Estimators (ALL)	267	2.5	1.9	2.3	2.3	3.0	2.3
Payoff		--	--	2.5	--	3.0	--
Bkpping, Acctg & Aud (const only)	143	--	1.4	1.6	1.8	1.7	--
Bkpping, Acctg & Aud (ALL ind)	1776	1.3	1.4	1.5	1.5	1.5	2.1
Payoff		--	1.5	1.6	1.5	1.7	--
Mgr. General & Ops (const only)	118	--	3.1	2.7	2.5	5.0	6.4
Mgr. General & Ops (ALL ind)	2121	2.2	2.4	2.6	2.6	3.3	4.4
Payoff		--	2.5	2.8	2.8	3.7	4.5

Exhibit 3: College Comparison with Cost Build Up Summary Sheet

College Net Pricing Calculations and Comparison Information Sheet								
	National Median	Florida State University	University of Central Florida	University of Florida	University of South Florida	Lake - Sumter State	Valencia College	Seminole State College
		FSU Home Page	UCF Home Page	UF Home Page	USF Home Page	LSS Home Page	Valencia Home Page	Seminole Home Page
Location		Tallahassee, FL	Orlando, FL	Gainesville, FL	Tampa, FL	Leesburg, FL	Orlando, FL	Sanford, FL
Type		4-yr. public, city, large	4- yr, public, suburban, large	4 -yr. public, city, Large	4-yr. public, city, large	2-yr. public, medium	2-yr. public, large	Certificate, public, large
Enrollment		32,229	54,091	32,376	30,282	3,797	37,925	15,747
% Full-time		90%	69%	92%	78%	35%	40%	38%
Graduation Rate		79%	70%	87%	68%	37%	44%	38%
Salary after attending(+10 yrs on)	\$34,300	\$44,900	\$43,300	\$53,100	\$41,800	\$28,900	\$31,000	\$31,400
% above HS Threshold(+6 yrs. On)		70%	71%	75%	69%	46%	50%	53%
"List" Price		\$21,724	\$21,840	\$21,210	\$18,930	\$16,825	\$16,003	\$11,444
Avg. Annual Cost		FSU Net Price Calculator	UCF Net Price Calculator	UF Net Price Calculator	USF Net Price Calculator	LSSC Net Price Calc	Valencia Net Price Calc	Seminole Net Price Calc
"Net" Price	\$16,099	\$15,664	\$14,221	\$12,022	\$11,232	\$4,731	\$6,451	\$8,654
Family Income:								
\$0-\$30,000		\$12,155	\$11,028	\$7,024	\$7,544	\$4,229	\$6,125	\$7,270
\$30,001-\$48,000		\$13,215	\$12,570	\$7,176	\$9,007	\$5,221	\$6,904	\$8,551
\$48,001-\$75,000		\$15,990	\$15,062	\$8,578	\$12,287	\$9,090	\$8,831	\$10,984
\$75,001-\$110,000		\$18,400	\$17,636	\$11,982	\$16,094	\$8,375	\$9,711	\$12,690
\$110,000+		\$19,286	\$18,045	\$17,099	\$17,088	\$10,136	\$5,299	\$12,941
Students Receiving Fed Loans		46%	44%	31%	46%	5%	21%	30%
Typical Debt After Graduation		\$20,750	\$18,271	\$15,815	\$19,148	\$7,847	\$8,250	\$10,027
Typical Monthly Loan Payment		\$215/mo.	\$189/mo	\$164/mo.	\$198/mo.	\$81/mo.	\$85/mo.	\$104/mo.
% Students paying down their debt	47%	63%	59%	68%	57%	46%	21%	31%
Top 3 Academic Programs		Business, Mgmt, Mktg 17%	Business, Mgmt, Mktg 20%	Engineering 13%	Health Professions 18%	Liberal Arts/Humanities 75%	Liberal Arts/Humanities 51%	Liberal Arts/Humanities 35%
		Social Sciences 17%	Health Professions 15%	Social Sciences 11%	Business, Mgmt, Mktg 17%	Health Professions 14%	Business, Mgmt, Mktg 22%	Business, Mgmt, Mktg 23%
		Biological/Biomedical 8%	Psychology 9%	Biological/Biomedical 10%	Social Sciences 13%	Computer & IS 3%	Computer & IS 7%	Health Professions 11%

Annual Cost Build Up:							Tuition/Books only
Tuition		\$5,656	\$5,954	\$6,380	\$4,580	Sum	\$22,570
Room & Board		\$10,304	\$9,764	\$10,120	\$8,750		
Books/Supplies		\$1,000	\$1,152	\$1,030	\$1,500	Sum	\$4,682
Transportation				\$2,570		Total Tuition & Books	\$27,252
Personal Expenses		\$4,764	\$4,970	\$2,570	\$4,100	Annual Average	\$6,813
Total		\$21,724	\$21,840	\$21,210	\$18,930	4 year total	\$27,252
<hr/>							
Grant (free \$\$)		\$4,033	\$3,773	\$5,000	\$4,676		
"Net"		\$17,691	\$18,067	\$18,210	\$14,254		
<hr/>							
Loan* indicated from calcaultro				\$5,500			
Student Work		\$3,000	\$3,000	\$3,000	\$3,000		
Balance/parents* derived from totals		\$14,691	\$15,067	\$7,710	\$11,254		
Loans- all (student + parent) x 4 yrs.		\$58,764	\$60,268	\$52,840	\$45,016		
<hr/>							
Average Loan: Total 4 yrs.	\$54,222					Jeff Bezos:	
Loan Payment (10 yr)						Princeton 1986	
Citizen's Bank website:		Citizens Bank Student Loan Calculator					Electrical Engineering/ Computer Science
Fixed Rate: 7.74-10.74							
Payment: 651-736/mo	\$694						
Annual Payments	\$8,322						
Total Repayment: \$78,000-88,000	\$83,220						

Exhibit 4: Occupation Skill Matrix

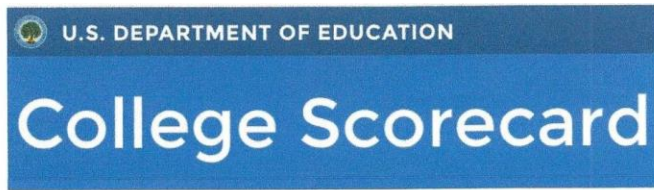
SKILL OCCUPATION MATRIX													
Category*	DOT*	Tasks*	Construction Occupation	Lifetime Earnings	Lifetime Earnings	Sample Total	% of sample	Earnings Differentials	Individual NPV 10 loan yr. 3% @ \$8322/yr	FL Sector Population	NPV Govt Revenue/Deficit Tuition/books only	Total Govt. Expenditures	
				4-yr degree / median (mill \$)	HS diploma / median (mill \$)								
Non Routine:	General Educational Development, Mathematics												
Cognitive Analytic		Low level: Basic Computations Mid level: Formulas, quality defect calc. High Level: Aerodynamic analysis	Bookkeeping & Audit	1.7	1.4	143	1.39	0.3	(\$34,780)	2707	(\$2,381)	\$26,366,310	
			Total (wtd avg.)	1.7	1.4	143	1.39	0.3		2707	(\$2,381)	\$26,366,310	
Non Routine:	Adaptability to accepting Responsibility for the Direction, Control or Planning of an activity												
Cognitive Interactive		ALL: Plans and designs buildings Applies Acctg Principles to install sys Prosecution Attorney General & Operations Mgr. Sales	Supervision Construction Mgr. Misc Mgr. CEO & Legislatures General & Operations Mgr. Sales	2.2 3.0 3.1 4.0 5.0 3.4	2.0 2.3 2.2 2.7 3.1 1.8	1256 1247 833 342 118 191	12.20 12.11 8.09 3.32 1.15 1.85	0.2 0.7 0.9 1.3 1.9 1.6	(\$28,272) \$65,194 \$94,033 \$145,400 \$233,771 \$240,959	25044 26587 17520 6325 2310 3547	\$7,717 \$1,410,305 \$341,891 \$135,653 \$82,395 \$150,587	\$261,139,565 \$399,811,367 \$234,230,940 \$97,226,960 \$36,035,320 \$51,318,241	
			Total (wtd avg.)	2.93	2.22	3987	38.72	0.71		81333	\$2,128,548	\$1,079,762,393	
Routine Cognitive	Adaptability to situations requiring the precise attainment of Set Limits, Tolerances, or Standards												
		ALL: Equipment Mechanical Set-up Prepares and verifies voter lists Operates transcription machine	Cost Estimator Sec & Office Admin.	3.3 1.5	1.9 1.3	183 383	1.78 3.72	1.4 0.2	\$162,778 (\$51,823)	3598 7065	\$107,697 (\$51,050)	\$2,021,343 \$85,345,088	
			Total (wtd avg.)	2.08	1.49	566	5.50	0.59		10663	\$56,647	\$87,366,431	
Non Routine Manual	Ability to move the hand and foot coordinately with each other in accordance with visual stimuli												
		Low Level: Machine Operator- crimper Mid Level: Pilot airplanes/prunes trees High Level: Gymnastics	Carpenter Electrician HVAC Plumber Equipment Operators* Drivers *	1.6 2.3 1.7 1.8 1.6 1.5	1.4 1.5 1.7 1.6 1.5 1.4	940 771 587 573 276 243	9.13 7.49 5.70 5.56 2.68 2.36	0.20 0.80 0.00 0.20 0.10 0.10	(\$33,744) \$80,024 (\$65,144) (\$38,912) *no data* *no data*	24898 19252 13830 14286	\$14,075 \$508,509 (\$98,659) (\$4,193)	\$231,560,244 \$185,400,806 \$129,226,259 \$128,871,983	
			Total (wtd avg.)	1.80	1.52	3390	32.92	0.29		72266	\$419,732	\$675,059,292	
Routine Manual	Ability to move fingers, and manipulate small objects with fingers, rapidly or accurately												
		ALL: Baker, Seamstress, Machine Operator- material feed Fruit Packer	Laborers Painter Roofer *	1.6 1.6 1.6	1.3 1.4 1.4	1532 456 223	14.88 4.43 2.17	0.30 0.20 0.20	(\$30,743) (\$20,546) *no data*	44755 12784	\$63,251 \$42,873	\$405,711,425 \$115,695,641	
			Total (wtd avg.)	1.60	1.33	2211	21.47	0.27		57539	\$106,124	\$521,407,066	
			Total / Total				10297	100.00		224508	\$2,708,670	\$2,389,961,492	

Exhibit 5: Interviewee Attribute Summary Sheet

Co. ID	Interviewee Education	Yrs. w/ Co.	Sector	Annual Sales Revenue	No of Employees	No of Employees (actual)	Tuition Reimburs	Interns	Degree Req'd-Salary	Degree Req'd Hourly	Alliance
#1	Bachelor	5 yrs.	General Contractor	\$5-10 mil.	<50		??	Yes / 4	No	NA	No
#2	HS	40 yrs,	General Contractor	\$200 mil	>50 / <100	60	Yes	Yes / 4	50 /50	No	No
#3	HS, some no deg	??	Engineering & Mgmt	\$12.7 mil	>50 / <100	65/86	No	Yes / 2	depends	No	Yes
#4	??	2 yrs	Heavy Const. Contract	\$556.2 mil	>500 / <1000		??	Yes /	depends	No	No
#5	Masters	10 yrs	General Contractor	\$12.0 mil	<50	10	N/A	No	depends	N/A	No
#6	MBA	8/++	General Contractor	\$2.6 bil	>2500	235	Yes	Yes / 10	No	No	No
#7	Bachelor	4/28	General Contractor	\$140 mil	<50	19	??	??			No
#8	Bachelor	26	Construction - Trades	\$26.7 mil	>100 / <500	250	Yes	No	No	No	No
#9	Bachelor	30	Construction - Trades	\$14.9 mil	>100 / <500	450	??	No	Yes	No	No
#10	Bachelor	25	General Contractor	\$252.6 mil	>50 / <100	55 /400	No	1-2	depends	No	No
#11	HS, some no deg	10/18	Construction - Trades	\$43.9 mil	>100 / <500	150/300	depends	No	depends	No	No
#12	HS, some no deg	40	Construction - Special Tra	\$59.7 mil	>100 / <500	180/	depends	No	No	No	Yes

Appendix B: Primary Templates and Supportive Backup

Exhibit 1: College Scorecard Template



1. The College Scorecard:
<https://collegescorecard.ed.gov/>

where net price calculators reside...



University of Florida

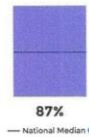
Gainesville, FL
 32,376 undergraduate students
ufl.edu



Average Annual Cost
 ⓘ



Graduation Rate
 ⓘ



Salary After Attending
 ⓘ



Costs

Average Annual Cost
 ⓘ



CALCULATE YOUR PERSONAL NET PRICE

By Family Income

Depending on the federal, state, or institutional grant aid available, students in your income bracket may pay more or less than the overall average costs.

FAMILY INCOME	AVERAGE COST
\$0-\$30,000	\$7,024
\$30,001-\$48,000	\$7,176
\$48,001-\$75,000	\$8,578
\$75,001-\$110,000	\$11,982
\$110,001+	\$17,099

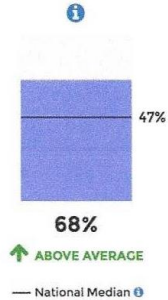
Average Annual Cost
 ⓘ

Average Annual Cost The average annual net price for federal financial aid recipients, after aid from the school, state, or federal government. For public schools, this is only the average cost for in-state students.
 \$16,099



Financial Aid & Debt

Students Paying Down Their Debt



Get Help Paying for College

Submit a free application for Federal Student Aid. You may be eligible to receive federal grants or loans.

[START MY APPLICATION](#)

Students Receiving Federal Loans

31%

At some schools where few students borrow federal loans, the typical undergraduate may leave school with \$0 in debt.

Typical Total Debt After Graduation

\$15,815

For undergraduate borrowers who complete college

Typical Monthly Loan Payment

\$164/mo



Students Paying Down Their Debt

Students Paying Down Their Debt
The share of student borrowers who have paid at least one dollar of the principal balance on their federal loans within three years of leaving school.

Students Receiving Federal Loans

Students Receiving Federal Loans
The share of undergraduate students who borrowed federal loans to help pay for college. Excludes Parent PLUS loans. For students who do not borrow federal loans, the typical undergraduate receives \$0 in federal loans.

Typical Total Debt After Graduation

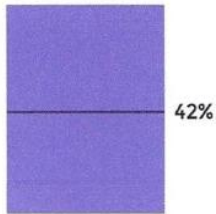
Typical Total Debt After Graduation
The median federal debt of undergraduate borrowers who completed. This figure includes only federal loans; it excludes private student loans and Parent PLUS loans.

Typical Monthly Loan Payment

Monthly Student Loan Payment
The median monthly loan payment for student borrowers who completed, if it were repaid over 10 years at a 4.45% interest rate.

Graduation & Retention

Graduation Rate

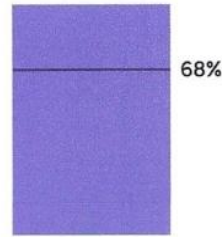


87%

↑ ABOVE AVERAGE

— National Median ⓘ

Students Who Return After Their First Year



96%

↑ ABOVE AVERAGE

— National Median ⓘ

Graduation Rate



Graduation Rate The graduation rate within 150 percent of the expected time to completion (typically six years for schools that award predominantly four-year degrees and three years for schools that award predominantly two-year degrees). These rates are only for full-time students enrolled for the first time.



Students Who Return After Their First Year



Students Who Return After Their First Year The share of first-time, full-time undergraduates who returned to the institution after their freshman year.

National Median The national median is the middle value, with half of schools having a higher value and half having a lower value.

— National Median ⓘ

National Median The national median is the middle value, with half of schools having a higher value and half having a lower value.

— National Median ⓘ

Earnings After School

Percentage Earning Above High School Grad ⓘ

75% of students

who attend this school earned, on average, more than those with only a high school diploma.

Salary After Attending ⓘ



chool Grad ⓘ

Threshold Earnings The share of former students earning more than \$25,000, or about the average earnings of a high school graduate aged 25-34, 6 years after they first enroll.

Salary After Attending ⓘ

Salary After Attending The median earnings of former students who received federal financial aid, at 10 years after entering the school.

Student Body



Large

32,376 undergraduate students



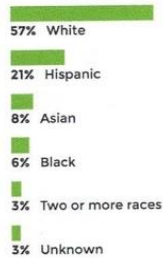
92% / **8%**
Full-time / Part-time

Socio-Economic Diversity

30% of students

received an income-based federal Pell grant intended for low-income students.

Race/Ethnicity ⓘ



Race/Ethnicity ⓘ

Race/Ethnicity The specific race/ethnicity categories (including those for foreign students pursuing postsecondary education at an institution within the U.S.) are either required (1997) and/or approved (2007) by the Office of Management and Budget (2007). Only the race/ethnicity groups of students enrolled in this institution are displayed.

Test Scores

Students who were admitted and enrolled typically had standardized test scores in these ranges.

SAT

Critical Reading



Math



Writing



ACT



Test Scores

Students who were admitted and enrolled typically had standardized test scores in these ranges. At schools that report their test scores, 50 percent had scores within this range. Of the remaining 50 percent, half were above the range and half were below. Not all schools require test scores.

Academic Programs

Most Popular Programs

1. Engineering (13%)
2. Social Sciences (11%)
3. Biological and Biomedical Sciences (10%)
4. Business, Management, Marketing, and Related Support Services (10%)
5. Communication, Journalism, and Related Programs (8%)

Available Areas of Study

- Agriculture, Agriculture Operations, and Related Sciences
- Architecture and Related Services
- Area, Ethnic, Cultural, Gender, and Group Studies
- Biological and Biomedical Sciences
- Business, Management, Marketing, and Related Support Services
- Communication, Journalism, and Related Programs
- Computer and Information Sciences and Support Services



Most Popular Programs

The five largest programs of study, as measured as the share of degrees and certificates awarded.

Available Areas of Study

All available programs of study offered at the school.

Exhibit 2: Cost Calculator Assumptions

Mon Jan 07 10:43:19 CST 2019

1/7/19, 11:44 AM



My Estimated Net Price for Academic Year 2018-19 is \$ 16,210

How did we calculate your net price? Your net price is the cost of attendance (estimated below) minus grants and scholarships (money you do not have to pay back) that you may receive.

Estimated Cost of Attendance

Tuition & Fees	\$	6,380
Room & Board	\$	10,120
Books & Supplies	\$	1,030
Transportation	\$	1,110
Personal Expenses	\$	2,570
Estimated Total Cost of Attendance	\$	21,210

Estimated Grant/Gift Aid

Institutional Grant	\$	5,000
Estimated Total Grant/Gift Aid	\$	5,000
ESTIMATED NET PRICE	\$	16,210

Estimated Self Help

Student Loan	\$	5,500
Student Work	\$	3,000
Estimated Total Self Help	\$	8,500
ESTIMATED REMAINING COST	\$	7,710



■ Grant Aid ■ Self Help ■ Remaining Cost

This chart shows the estimated share of money available to you from grant aid (money that does not have to be repaid) and self-help (money that you earn or borrow). The difference between your cost of attendance and these two sources of funds is the amount you will be responsible for paying. It is the estimated "Remaining Cost," and is the third slice of the pie. This portion includes your calculated "expected family contribution" (EFC). Depending on factors such as your year in college and your financial aid dependency status, you may be able to borrow additional federal or private unsubsidized loans to cover your estimated remaining cost.

NOTE:

The estimate provided using this net price calculator does not represent a final determination, or actual award, of financial assistance. The price of attendance and financial aid availability may change. This estimate shall not be binding on the Secretary of Education, the institution of higher education or the state in which this institution of higher education is located. Students must complete the Free Application for Federal Student Aid (FAFSA) in order to be eligible for, and receive, an actual financial aid award that includes federal grants, loans or work-study assistance. For more information on applying for federal

student aid please go to www.fafsa.ed.gov

Mon Jan 07 10:43:19 CST 2019



Office for Student Financial Affairs

My Next Steps

Listed below are suggested tasks for you to consider as you prepare to plan for and attend college.

My Next Steps

[Complete Your FAFSA](#)

[Schedule a visit to UF](#)

[Apply for Admission](#)

HELPFUL INFORMATION

You will be required to complete the FAFSA (Free Application for Federal Student Aid) if you wish to be considered for financial aid based on need. Start this process in October of your senior year in high school. Complete requested applications for state grant programs and college financial aid forms as well.

Visiting colleges and taking campus tours can give you a sense of "fit." You may also be able to attend a class and interact with current students.

Ready to take the next step? Visit our website for information about how to apply for admission and financial aid.

Mon Jan 07 10:43:19 CST 2019



Office for Student Financial Affairs

My Information

This page displays the answers you provided that determined your cost of attendance, estimated financial aid and net price. Review your answers and click "Edit" if there is information you wish to correct or update. When you have finished making your changes, you may recalculate your results.

[CollapseAll](#) [ExpandAll](#)

Student information

What is your first name?	Sheila
---------------------------------	--------

HELPFUL INFORMATION

This page can be used to keep your personal information up-to-date.

Simply click on one of the headers to review your information, and use the "edit" button to make any corrections or updates that you find necessary.

What year were you born?	2000
What grade are you in?	12th grade
What is your state of legal residence?	Florida
What is your marital status?	Never married
Do you have any dependent children?	No
Where do you plan to live while you are in college?	On campus
Are you an orphan or ward of the court?	No
Are you a veteran of the U.S. Armed Forces or currently serving on active duty for purposes other than training?	No
If you expect to receive a Florida Bright Futures Scholarship, what level of award do you expect to receive?	I do not expect to receive a Florida Bright Futures Scholarship.
What is your status at this school?	I'm just looking

Not correct? Click the edit button to make changes.

Parent Household Information

What is your parents' marital status?	Married or in a domestic partnership
What is your older parent's year of birth?	1977
What is your parents' state of legal residence?	Florida
How many people are in your parents' household?	4
How many people in your parents' household are planning to attend college at least half-time while you are in college? Include yourself.	1

Not correct? Click the edit button to make changes.

Parent Income Information

What federal income tax form did your parents file?	I'm not sure
What is your parents' combined adjusted gross income (AGI) or income earned from work (if they are not required to file a tax return)?	64000
How much did your parents pay in federal taxes?	14750
How much did parent 1 earn from work?	64000
How much did parent 2 earn from work?	0
How much did your parents receive in interest and dividend income?	0
How much did your parents report in education tax	0

credits?	
How much did your parents contribute to non-taxable retirement plans and/or receive in untaxed income and benefits, such as child support?	0
Not correct? Click the edit button to make changes.	

Parent Assets Information

How much do your parents currently have in cash, savings, and checking accounts?	50000
Not correct? Click the edit button to make changes.	

Student Finances information

How much did you earn from work?	5000
What is your adjusted gross income (AGI)?	5000
How much did you pay in federal taxes?	0
How much did you receive in untaxed income and benefits?	0
How much do you currently have in cash, savings, checking accounts, and investments? (Do not include retirement funds.)	10000
Not correct? Click the edit button to make changes.	

REGULATIONS

The estimate provided using this net price calculator does not represent a final determination, or actual award, of financial assistance. The price of attendance and financial aid availability may change. This estimate shall not be binding on the Secretary of Education, this institution of higher education or the state in which this institution of higher education is located. Students must complete the Free Application for Federal Student Aid (FAFSA) in order to be eligible for, and receive, an actual financial aid award that includes federal grants, loans or work-study assistance. For more information on applying for federal student aid, please go to www.fafsa.ed.gov.

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Exhibit 3: Occupational Analysis Worksheets

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																			
State of Florida		960,000		1. For All FLA Sectors excl. Construction: 2016 constant dollar differences indicate a \$2.4 million difference between the lowest and highest lifetime earnings among respondents. 2. For ALL FLA sectors: those with a Master's degree earned nearly \$1 million more over a lifetime than those in Group 5 (Bachelor's). 3. For ALL FLA sectors: Group 5 (Bachelor's), earned nearly \$1.4 million over the lowest ED attainment level, Group 1 (<HS) (~+117%) 4. For ALL FLA sectors: Group 5 (Bachelor's), earned over \$750,000 over the next lowest ED attainment level, Group 4 (Assoc) (~+42%)																			
State of Florida (Age 24-65)		490,000																					
State of Florida (Age 24-65) Employed		180,000																					
State of Florida (Age 24-65) Employed in Construction Industry		15,415																					
Employed min wage floor in Construction		13,108																					
ALL Sectors excl. CON		147051																					
Florida		Age Grp 1	Age Grp 2	Age Grp 3	Age Grp 4	Age Grp 5	Age Grp 6	Age Grp 7	Age Grp 8	Total	Lifetime	%	Industry	Industry									
		(25-29)	(30-34)	(35-39)	(40-44)	(45-49)	(50-54)	(55-59)	(60-64)	Count	Earnings	ED Level	Earnings	Earnings									
Education Attainment (EDrecode)	ED	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	2016 \$\$ State of FLA		Total	Proportion		
H. S. or Below - no dipl	1	25559	705	26899	856	29569	960	30670	1160	30418	1316	31145	1419	30670	1315	30625	877	8608	\$1,177,775	5.9%	10,138,287,200	3.3%	
HS Diploma	2	29069	3156	31681	3569	35266	3626	36273	4343	37374	5302	37827	6063	38288	5350	38225	3292	34701	\$1,420,015	23.6%	49,275,940,515	16.3%	
some college, no diploma	3	30802	3448	35905	3368	40894	3705	42561	4080	46005	4501	47357	5161	46718	4550	47028	3132	31945	\$1,686,350	21.7%	53,870,450,750	17.8%	
Associate's Degree	4	32445	1798	38849	2159	42584	2151	44983	2362	49105	2488	50696	2706	51117	2291	50379	1487	17442	\$1,800,790	11.9%	31,409,379,180	10.4%	
Bachelor's Degree	5	42,319	4189	51387	4571	62290	4511	67481	4904	71564	5006	73609	5327	72672	4363	70596	2877	35748	\$2,559,590	24.3%	91,500,223,320	30.2%	
Mas, Prof, Doc Degree	6	55765	1409	70542	2280	86899	2416	96211	2712	99514	2800	102234	2672	105301	2459	100759	1859	18607	\$3,586,125	12.7%	66,727,027,875	22.0%	
Total		35266	14705	40894	16803	46640	17369	48668	19561	50379	21413	50696	23348	50696	20328	50379	13524	147051		100.0%	302,921,308,840	100.0%	
		color denotes value derived from total proportional change to next age group.																					

All Sectors excluding Construction

Analysis: TESTS

NPV

Kruskall-Wallis Test of differences between medians #REF!

One Way ANOVA: Wtdwage by Factor: ED

F Ratio: 5285.264 Significant at .000 level, lack of variance between groups due to ED factor
Effect Size: 0.1523256 Cohen large effect (.06 break point) (Pallent: p264 Small = .01, Medium = .06, Large = .14)

Median

Post Hoc Significant differences in means exist between nearly all Groups

T
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k
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Y

Dependent Variable:
WTDWAGE

Significant Relationships highlighted in green

Chi-Square tests: both tests yield values Significant, indicating significant differences exist between groupings. (All Groups included in analysis)

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
Strength of Relationship: Spearman's rho (non parametric (given reliance on median) = .450 (for this sector) Strength medium (range .30-.49) per Pallent p.139 ((Cohen (1988, pp.79-81))
Coefficient of Determination: r squared = .203 20.3% variance overlap

Small: r = .10-.29
Medium: r = .30-.49
Large: r = .50-1.0

Linear Regression

Dependent: WTDWAGE
Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(ED recode, AgeGroup)
Annual earnings are a function of Education Attained and Age Group

M
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WTDWAGE = -17347 + 16573 (ED recode) + 5212 (Age Group)

Incremental increases in education and age impact annual earnings by \$16500 and \$5200 respectively.

Adj. R Square = .156 Approximately 15.6% of earnings variance is determined by education level and age

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ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																		
State of Florida		960,000		1. For the total Construction sector: 2016 constant dollar differences indicate a \$1.7 million difference between the lowest and highest lifetime earnings among respondents. 2. For this sector: those with a Master's degree earned the highest level of lifetime earnings and \$450,000 over those in Group 5 (Bachelor's). 3. For this sector: Group 5 (Bachelor's), earned nearly \$1.2 million over the lowest ED attainment level, Group 1 (<HS) (~+92%) 4. For this sector: Group 5 (Bachelor's), earned nearly \$700,000 over the next lowest ED attainment level, Group 4 (Assoc) (~+31.6%)																		
State of Florida (Age 24-65)		490,000																				
State of Florida (Age 24-65) Employed		180,000																				
State of Florida (Age 24-65) Employed in Construction Industry		15,415																				
Employed min wage floor in Construction		13,108																				
NAISCP = 23 (Recode= 19)																						
ALL CONSTRUCTION		13108																				
Education Attainment (EDrecode)	ED	Age Grp 1 (25-29)		Age Grp 2 (30-34)		Age Grp 3 (35-39)		Age Grp 4 (40-44)		Age Grp 5 (45-49)		Age Grp 6 (50-54)		Age Grp 7 (55-59)		Age Grp 8 (60-64)		Total Count	Lifetime Earnings	% ED Level	Industry Earnings	Industry Earnings
		Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	2016 \$\$ State of FLA	Total	Proportion		
H. S. or Below - no dipl	1	26401	209	29069	307	31145	336	32445	349	36804	330	36072	317	36961	210	34779	131	2189	\$1,318,380	16.7%	2,885,933,820	12.4%
HS Diploma	2	31035	484	33737	575	38017	598	40129	699	41311	787	42627	830	43961	670	45409	381	5024	\$1,581,130	38.3%	7,943,597,120	34.2%
some college, no diploma	3	35266	234	40557	326	41572	373	42117	346	48364	386	47654	471	51117	383	55417	269	2788	\$1,810,320	21.3%	5,047,172,160	21.7%
Associate's Degree	4	37535	98	40304	113	45626	119	46043	143	47028	163	50696	160	47439	140	54464	90	1026	\$1,845,675	7.8%	1,893,662,550	8.1%
Bachelor's Degree	5	45,842	138	56229	199	70531	221	60835	223	67586	225	70542	276	69587	198	66452	178	1658	\$2,538,020	12.6%	4,208,037,160	18.1%
Mas, Prof, Doc Degree	6	50696	27	71564	57	79401	54	80607	55	97542	64	60194	69	70531	53	87725	44	423	\$2,991,300	3.2%	1,265,319,900	5.4%
Total		32445	1190	36273	1577	40557	1701	41527	1815	44641	1955	45626	2123	47028	1654	50870	1093	13108		100.0%	23,243,722,710	100.0%

Construction Sector Total

NAISCP Construction Only

Analysis: TESTS

Kruskal-Wallis Test of differences between medians

One Way ANOVA: Wtdwage by Factor: ED

Median

F Ratio: 262.972 **Significant** at .000 level, lack of variance between groups due to ED factor
 Effect Size: 0.09121042 Cohen medium effect (.06 break point)

Post Hoc Tukey **Significant** differences in means exist between nearly all Groups

Dependent Variable: WTDWAGE

Significant Relationships highlighted in green

Chi-Square tests: both tests yield values **Significant**, indicating significant differences exist between groupings. (All Groups included in analysis)

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric

Strength of Relationship: Spearman's rho (non parametric (given reliance on median) = .330
 (for this sector) Strength medium (range .30-.49) per Pallant p.139 ((Cohen (1988, pp.79-81))

Coefficient of Determination: r squared=.109
 10.9% variance overlap

Small: r=.10-.29
 Medium: r=.30-.49
 Large: r=.50-1.0

Linear Regression

Dependent: WTDWAGE

Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
 Annual earnings are a function of Education Attained and Age Group

MODEL:
 WTDWAGE = 10502 + 10370 (EDrecode) + 3723 (Age Group)
 Incremental increases in education and age impact annual earnings by \$10400 and \$3700 respectively.

Adj. R Square = .104
 Approximately 10.4% of earnings variance is determined by education level and age

Collinearity: Tolerance > .10 / VIF < 10
 Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .277
 Age Group Standardized Beta: .154
 ED **significant** at .000 level.
 Age **significant** at .

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																	
State of Florida	960,000	<p>1. For this occupation: Bookkeeping, Acctg & Audit - 2016 constant dollar differences indicate a \$780,000 difference between the lowest and highest lifetime earnings among respondents. vs. Georgetown Study: \$220,000 difference between similar groups.</p> <p>2. For this occupation: those with a Master's degree earned the highest level of lifetime earnings. vs. Georgetown Study :those with a Bachelor's degree earning the highest level of lifetime earnings.</p> <p>3. For this occupation: beyond Group 6 (Masters+), little disparity existed between Groups (\$240,000) vs. Georgetown Study: a slightly higher \$220,000 differential was found between like groups.</p> <p>Georgetown study did not report earnings in Group 1 (below HS) nor Group 6 (Masters+) due to lack of data representation.</p>																			
State of Florida (Age 24-65)	490,000																				
State of Florida (Age 24-65) Employed	180,000																				
State of Florida (Age 24-65) Employed in Construction Industry	15,415																				
Employed min wage floor in Construction	13,108																				
SOC Occupation(433031) Recode:268																					
Bookkeeping, Acctg & Audit	1776																				
ALL INDUSTRIES																					
Education Attainment (EDrecode)	ED	Age Grp 1 (25-29)		Age Grp 2 (30-34)		Age Grp 3 (35-39)		Age Grp 4 (40-44)		Age Grp 5 (45-49)		Age Grp 6 (50-54)		Age Grp 7 (55-59)		Age Grp 8 (60-64)		Total Count	Lifetime Earnings	NPV	Lifetime Earnings
		Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	2016 \$\$ State of FLA	Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$	
H. S. or Below - no dipl	1	17180		19008	3	27753	6	32631	5	32097	6	37035	10	53057	16	41916	10	56	\$1,303,385		\$0
HS Diploma	2	25559	23	33221	31	37432	44	35843	64	36501	96	36653	112	36647	113	40303	67	550	\$1,410,795	1,300,000	\$1,454,251
some college, no diploma	3	29069	43	33741	49	36804	67	40304	89	37620	90	40304	117	40557	133	42584	95	683	\$1,504,915	1,400,000	\$1,566,117
Associate's Degree	4	31145	17	35057	20	40304	13	35216	38	40894	21	43782	46	44990	40	38334	21	216	\$1,548,610	1,300,000	\$1,454,251
Bachelor's Degree	5	31,681	28	34760	27	36336	19	40129	39	37374	33	45626	31	45626	29	30625	17	223	\$1,510,785	(\$4,977)	\$1,677,982
Mas, Prof, Doc Degree	6	54184	3	38628	6	67928	6	35487	7	39073	9	103817	7	42584	8	35652	2	48	\$2,086,765		\$0
Total		30544	114	33767	136	37374	155	38017	242	36961	255	40303	323	40303	339	40303	212	1776			
color denotes value derived from total proportional change to next age group.																					

Bookkeeping, Accounting, Audit

Analysis: TESTS

Kruskal-Wallis Test of differences between medians

Median

Chi-Square tests: both tests yield values **Significant**, indicating significant differences exist between groupings. (All Groups included in analysis)

One Way ANOVA: Wtdwage by Factor: ED

F Ratio: 8.173 **Significant** at .000 level, lack of variance between groups due to ED factor
Effect Size: 0.022565598 Cohen small effect (.06 break point)

Post Hoc Tukey **Significant** differences exist between Masters+ Group and all other groups
Significant differences exist between Group 5 (Bachelor's) and Group 2 (HS)

Dependent Variable:
WTDWAGE

Significant Relationships highlighted in green

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric

Strength of Relationship: Spearman's rho (non parametric (given reliance on median) = .105
(for this occupation) Strength very small (range .10-.29) per Cohen (1988, pp.79-81)

Coefficient of Determination: r squared=.011
1.1% variance overlap

Linear Regression

Dependent: WTDWAGE
Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
Annual earnings are a function of Education Attained and Age Group

MODEL:
WTDWAGE = 20795 + 4064 (EDrecode) + 2026 (Age Group)
Incremental increases in education and age impact annual earnings by \$4000 and \$2000 respectively.

Adj. R Square = .033
Approximately 3.3% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF<10
Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .149
Age Group Standardized Beta: .134
ED **significant** at .000 level.
Age **significant** at .000

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																		
State of Florida		960,000		<p>1. For this occupation: Cost Estimators (ALL Industries)- Education Group 1 (below HS) and Group 5 (Bachelor's) reported the highest overall earnings. Bachelor's earned incremental +\$400,000. vs. Georgetown Study: reported earnings for only two Education Groups: Group 3 (Some College) and Group 5 (Bachelor's)</p> <p>2. For this occupation: those with a Bachelor's degree earned \$600,000 more over a lifetime than the next lowest level of educational attainment. (25.6%) vs. Georgetown Study : \$600,000 differential found between like groups. Difference of \$300,000 over a lifetime.</p> <p>3. For this occupation: those with a Bachelor's degree earned approximately \$1 million more over a lifetime than those with the lowest level of earnings (Group 2 HS)(~+53%) vs. Georgetown Study: \$550,000 differential found between those groups reported.</p>																		
State of Florida (Age 24-65)		490,000																				
State of Florida (Age 24-65) Employed		180,000																				
State of Florida (Age 24-65) Employed in Construction Industry		15,415																				
State of Florida (Age 24-65) Employed min wage floor in Construction		13,108																				
SOC Occupation(131051) Recode:35																						
Cost Estimators ALL INDUSTRIES		267																				
Education Attainment (EDrecode)	ED	Age Grp 1 (25-29)		Age Grp 2 (30-34)		Age Grp 3 (35-39)		Age Grp 4 (40-44)		Age Grp 5 (45-49)		Age Grp 6 (50-54)		Age Grp 7 (55-59)		Age Grp 8 (60-64)		Total Count	Lifetime Earnings	NPV	Lifetime Earnings	
		Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count		2016 \$\$ State of FLA		Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$
High School or Below - no diploma	1	106461	1	40894	1	102273	1	44244		47521	1	63362	2	45931	2	58082	5	13	\$2,543,840			\$0
HS Diploma	2	39918	5	45626	5	47525	4	46552	6	52062	10	46470	16	47044	13	52802	5	64	\$1,889,995			\$0
some college, no diploma	3	36336	7	56615	8	54518	6	53054	14	73922	9	61373	20	70618	8	57528	8	80	\$2,319,820		2,200,000	\$2,461,041
Associate's Degree	4	41571	6	76100	2	76212	2	51909	3	61800	6	53162	3	44983	5	63385	3	30	\$2,345,610			\$0
Bachelor's Degree	5	46,718	11	76577	5	73922	13	79725	10	112457	3	71449	10	53190	8	77863	7	67	\$2,959,505	\$986,293	2,700,000	\$3,020,368
Masters, Professional, Doctorate Degree	6	60318	1	53985	3	51117	1	47399	2	75537	2	74500	2	20278	1	67481	1	13	\$2,253,075			\$0
Total		45341	31	53190	24	62290	27	53162	35	57099	31	53162	53	52395	37	58082	29	267				
color denotes value derived from total proportional change to next age group.																						

Cost Estimators

Analysis: TESTS

Kruskall-Wallis Test of differences between medians

One Way ANOVA: Wtdwage by Factor: ED

Median

F Ratio: 2.936 Significant to the .015 level, indicates variance greater between groups caused by factor(educations).
 Effect Size: 0.053243893 Cohen small effect (.06 break point)

Post Hoc Tukey Significant differences exist between Group 2 versus Group 5 (Bachelor)
 Non significant at .05 level between all other Groups

Dependent Variable:
 WTDWAGE

Significant Relationships highlighted in green

Chi-Square tests are both significant to the .006 level, .033 level respectively, indicating significant differences exist between groupings.

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
 Strength of Relationship: (for this occupation) Spearman's rho (non parametric (given reliance on median) = .185
 Strength small (range .10- .29) per Cohen (1988, pp.79-81)
 Coefficient of Determination: r squared=.034
 3.4% variance overlap

Linear Regression

Dependent: WTDWAGE
 Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
 Annual earnings are a function of Education Attained and Age Group

MODEL:
 WTDWAGE = 37254 + 5202 (EDrecode) + 2147 (Age Group)
 Incremental increases in education and age impact annual earnings by \$5200 and \$2100 respectively.

Adj. R Square = .024
 Approximately 2.4% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF<10
 Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .162
 Age Group Standardized Beta: .109
 ED significant at .009 level and makes statistically significant unique contribution to earnings
 Age is not significant at .077 level and does not make a significant and unique contribution to earnings.

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:												NPV		LifETIME					
ALL INDUSTRIES		Age Grp 1	Age Grp 2	Age Grp 3	Age Grp 4	Age Grp 5	Age Grp 6	Age Grp 7	Age Grp 8	Total	Lifetime												
		(25-29)	(30-34)	(35-39)	(40-44)	(45-49)	(50-54)	(55-59)	(60-64)	Count	Earnings												
Education Attainment (EDrecode)	ED	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	2016 \$\$ State of FLA	Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$					
State of Florida		960,000																					
State of Florida (Age 24-65)		490,000																					
State of Florida (Age 24-65) Employed		180,000																					
State of Florida (Age 24-65) Employed in Construction Industry		15,415																					
State of Florida (Age 24-65) Employed min wage floor in Construction		13,108																					
SOC Occupation(111021) Recode:3		Georgetown study did not report earnings in Group 1 (below HS).																					
Managers, General & Operations		2121																					
H. S. or Below - no dipl		1	42181	53057	6	48266	6	67481	15	46718	7	68519	5	67670	12	43603	5	56	\$2,187,475				
HS Diploma		2	47860	17	53066	30	55417	43	54326	52	68946	55	55417	62	70030	56	72151	34	349	\$2,386,065		2,200,000	\$2,461,041
some college, no diploma		3	45484	36	50534	52	55417	61	76676	65	67475	95	70974	85	74983	70	73609	47	511	\$2,575,760		2,500,000	\$2,796,637
Associate's Degree		4	43961	13	60835	25	63885	24	66452	35	63922	38	83832	41	64418	27	81113	15	218	\$2,642,090		2,500,000	\$2,796,637
Bachelor's Degree		5	52,874	64	64989	94	83054	81	85761	108	95043	101	93067	112	98181	78	91875	60	698	\$3,324,220	\$419,402	3,300,000	\$3,691,561
Mas, Prof, Doc Degree		6	48050	11	85538	29	81382	48	123125	56	121670	49	153101	49	142496	24	121443	23	289	\$4,384,025		4,000,000	\$4,474,619
Total			48364	141	60835	236	65474	263	78072	331	79743	345	77863	354	80607	267	82712	184	2121				
color denotes value derived from total proportional change to next age group.																							

Managers, General & Operations

Analysis: TESTS
 Kruskal-Wallis Test of differences between medians

One Way ANOVA: Wtdwage by Factor: ED

Median

F Ratio: 30.642 **Significant** at .000 level, lack of variance between groups due to ED factor
 Effect Size: 0.067543228 Cohen medium effect (.06 break point)

Post Hoc **Significant** differences exist between Bachelor's & Masters+ versus all other groups
 Tukey
 Dependent Variable: WTDWAGE

Significant Relationships highlighted in green

Chi-Square tests: both tests yield values **Significant**, indicating significant differences exist between groupings. (All Groups included in analysis)

Correlation Analysis
 Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
 Strength of Relationship: Spearman's rho (non parametric (given reliance on median) = .292
 (for this occupation) Strength small (range .10-.29) per Cohen (1988, pp.79-81)
 Coefficient of Determination: r squared=.085
 8.5% variance overlap

Linear Regression
 Dependent: WTDWAGE
 Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
 Annual earnings are a function of Education Attained and Age Group

MODEL:
 WTDWAGE = -1314 + 14483 (EDrecode) + 8687 (Age Group)
 Incremental increases in education and age impact annual earnings by \$14500 and \$8700 respectively.

Adj. R Square = .102
 Approximately 10.2% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF<10
 Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .254
 Age Group Standardized Beta: .216
 ED **significant** at .000 level.
 Age **significant** at .000 level.

3	.043	8.098	.99	.67	.38
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a. Dependent Variable: WTDWAGE

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																			
State of Florida		960,000		1. For this occupation: Bookkeeping, Acctg & Audit - 2016 constant dollar differences indicate a \$375,000 difference between the lowest and highest lifetime earnings among respondents. vs. Georgetown Study: \$220,000 difference between similar groups. 2. For this occupation: those with an Associate's degree earned the highest level of lifetime earnings. vs. Georgetown Study :those with a Bachelor's degree earning the highest level of lifetime earnings. 3. For this occupation: those with a Bachelor's degree earned slightly lower (~\$100,000) over a lifetime than those with the next lowest level of education attainment. vs. Georgetown Study: a slightly higher \$220,000 differential was found between like groups. Neither study reported earnings in Group 1 (below HS) nor Group 6 (Masters+) due to lack of data representation.																			
State of Florida (Age 24-65)		490,000																					
State of Florida (Age 24-65) Employed		180,000																					
State of Florida (Age 24-65) Employed in Construction Industry		15,415																					
Employed min wage floor in Construction		13,108																					
SOC Occupation(433031)																							
Recode:268																							
Bookkeeping, Acctg & Audit																							
		143																					
Education Attainment (EDrecode)		Age Grp 1 (25-29)		Age Grp 2 (30-34)		Age Grp 3 (35-39)		Age Grp 4 (40-44)		Age Grp 5 (45-49)		Age Grp 6 (50-54)		Age Grp 7 (55-59)		Age Grp 8 (60-64)		Total Count	Lifetime Earnings	NPV	Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$	
ED	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count		2016 \$\$ State of FLA			
H. S. or Below - no dipl (2 records excl)	1																		0	\$0			\$0
HS Diploma	2	28584	32243	1	40303	3	32183	11	32142	6	40129	7	32653	12	42472	2	42	\$1,403,545			1,300,000	\$1,454,251	
some college, no diploma	3	30923	37768	6	35827	4	34777	10	51710	9	33793	15	51117	11	46005	9	66	\$1,609,600			1,400,000	\$1,566,117	
Associate's Degree	4	31145	44983	1	40304	1	39601	6	35038	2	47437	5	60835	2	55765	3	21	\$1,775,540			1,300,000	\$1,454,251	
Bachelor's Degree	5	40,304	31681	3	29777	2	31392		54919	2	57025	1	45626	1	48160		10	\$1,694,420	\$70,717		1,500,000	\$1,677,982	
Mas, Prof, Doc Degree (2 records excl.)	6																	0	\$0			\$0	
Total		33205	4	36501	11	36571	10	33737	27	42241	19	35392	28	45626	26	44612	14	139					
color denotes value derived from total proportional change to next age group.																							

Bookkeeping, Acctg. & Audit

Analysis: TESTS

Kruskal-Wallis Test of differences between medians

One Way ANOVA: Wtdwage by Factor: ED

Median

F Ratio: 0.759 **Non Significant** lack of variance between groups due to ED factor
 Effect Size: 0.026953468 Cohen small effect (.06 break point)

Post Hoc Tukey **Non significant** variances in means between all groups.

Dependent Variable: WTDWAGE

Significant Relationships highlighted in green

Chi-Square tests: both tests yield values **Non Significant**, indicating significant differences do not exist between groupings. (Group 1 and Group 6 excluded from analysis)

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
 Strength of Relationship: (for this occupation) Spearman's rho (non parametric (given reliance on median) = .113
 Strength very small (range .10-.29) per Cohen (1988, pp.79-81)
 Coefficient of Determination: r squared=.013
 1.3% variance overlap

Linear Regression

Dependent: WTDWAGE
 Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
 Annual earnings are a function of Education Attained and Age Group

MODEL:
 WTDWAGE = 30857 + 1801 (EDrecode) + 1357 (Age Group)
 Incremental increases in education and age impact annual earnings by \$1800 and \$1400 respectively.

Adj. R Square = .001
 Approximately .1% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF<10
 Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .072
 Age Group Standardized Beta: .108
 ED **non significant** at .395
 Age **non significant** at .203 level.

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																			
State of Florida		960,000		1. For this occupation: Carpenters - 2016 constant dollar differences indicate a \$380,000 difference between the lowest and highest lifetime earnings among respondents. vs. Georgetown Study: \$220,000 difference between similar groups. 2. For this occupation: those with a Bachelor's degree earned \$130,000 more over a lifetime than the next lowest level of educational attainment. (+8.4%) vs. Georgetown Study : reported reduced earnings by \$110,00 for those with Bachelors degree like groups. 3. For this occupation: those with a Bachelor's degree earned approximately \$380,000 more over a lifetime than those with the lowest level of education attainment (~+30.9%) vs. Georgetown Study: no differential found between like groups.																			
State of Florida (Age 24-65)		490,000																					
State of Florida (Age 24-65) Employed		180,000																					
State of Florida (Age 24-65) Employed in Construction Industry		15,415																					
State of Florida (Age 24-65) Employed min wage floor in Construction		13,108																					
SOC Occupation(472031) Recode:321																							
Carpenters				940																			
		Age Grp 1		Age Grp 2		Age Grp 3		Age Grp 4		Age Grp 5		Age Grp 6		Age Grp 7		Age Grp 8		Total	Lifetime	NPV	Lifetime		
		(25-29)		(30-34)		(35-39)		(40-44)		(45-49)		(50-54)		(55-59)		(60-64)		Count	Earnings		Earnings		
Education Attainment (EDrecode)		ED	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count		2016 \$\$ State of FLA		Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$
High School or Below - no diploma		1	24211	18	28201	36	31681	48	36059	30	37164	36	30228	27	30670	27	29404	9	231	\$1,238,090		1,100,000	\$1,230,520
HS Diploma		2	27883	44	31681	58	30670	53	35782	63	36501	61	35420	68	38569	56	38412	27	430	\$1,374,590		1,300,000	\$1,454,251
some college, no diploma		3	30323	18	41185	17	42565	25	39576	26	33828	20	40430	32	35487	27	54914	10	175	\$1,591,540		1,200,000	\$1,342,386
Associate's Degree		4	62290	3	25190	3	38412	7	40304	5	43260	10	36758	8	33686	6	30338	2	44	\$1,551,190		1,200,000	\$1,342,386
Bachelor's Degree		5	39,543	2	36617	6	45626	7	40430	4	42051	6	31145	7	42241	3	46349	7	42	\$1,620,010	\$91,108	1,100,000	\$1,230,520
Masters, Professional, Doctorate Degree		6	20152	1	29419	2	25559	1	43488	2	38678	2	26401	3	20698	3	45860	4	18	\$1,251,275			\$0
Total			27923	86	31681	122	33221	141	38849	130	36501	135	35487	145	34276	122	36501	59	940				
color denotes value derived from total proportional change to next age group.																							

Carpenters

Analysis: TESTS

Kruskal-Wallis Test

Median Test

Chi-Square: significant for both tests, indicating differences in medians across all six education groupings.

One Way ANOVA: WTDWAGE by Factor: ED

Rationale: One independent variable (education) with multiple levels and different participants, one dependent continuous variable (wtd wage)

Comparison of Means

F Ratio: 4.335 Significant and indicates variance greater between groups caused by factor(educations).

Effect Size: 0.027537556 Cohen small effect (.06 break point)

Post Hoc Significant differences exist between Group 3 (some College) versus Group 1 (below HS) and Group 2 (HS)

Tukey

Non significant at .05 level between Group 6 (Master+) and all other Group ED levels

Non significant at .05 level between Group 4 (Assoc) and all other Group ED levels

Dependent Variable:

WTDWAGE

Significant Relationships highlighted in green

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship:

Positive: as Education increases, wages increase - both Parametric and Nonparametric

Strength of Relationship: (for this occupation)

Spearman's rho (non parametric (given reliance on median) = .149
Strength small (range .10-.29) per Cohen (1988, pp.79-81)

Coefficient of Determination:

r squared=.022
2.2% variance overlap

Linear Regression

Dependent: WTDWAGE

Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)

Annual earnings are a function of Education Attained and Age Group

MODEL:

WTDWAGE = 31439 + 2581 (EDrecode) + 916 (Age Group)

Incremental increases in education and age impact annual earnings by \$2600 and \$900 respectively.

Adj. R Square = .013

Approximately 1.3% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF<10

Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .091

Age Group Standardized Beta: .059

Sig = .005 education as independent variable makes a statistically significant unique contribution to earnings

Sig = .070 Age as independent variable **does not** make a statistically significant unique contribution to earnings.

ACS 2012-2016	Records	Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																				
State of Florida	960,000	1. For this occupation: Construction Manager - 2016 constant dollar differences indicate a \$1.3 million difference between the lowest and highest lifetime earnings among respondents. vs. Georgetown Study: \$2.35 million difference between similar groups. Difference of : \$1 million over a lifetime																				
State of Florida (Age 24-65)	490,000																					
State of Florida (Age 24-65) Employed	180,000	2. For this occupation: those with a Bachelor's degree earned approximately \$500,000 more over a lifetime than the next lowest level of educational attainment. (~+20%)																				
State of Florida (Age 24-65) Employed in Construction Industry	15,415	vs. Georgetown Study : \$900,000 differential found between like groups. Difference of : \$400,000 over a lifetime																				
Employed min wage floor in Construction	13,108	3. For this occupation: those with a Bachelor's degree earned approximately \$820,000 more over a lifetime than those with the lowest level of education attainment (~+40%) vs. Georgetown Study: \$1,800 million differential found between like groups. Difference: \$1 million over a lifetime.																				
SOC Occupation																						
Construction Manager	1247																					
		Age Grp 1	Age Grp 2	Age Grp 3	Age Grp 4	Age Grp 5	Age Grp 6	Age Grp 7	Age Grp 8	Total	Lifetime	NPV	Lifetime									
		(25-29)	(30-34)	(35-39)	(40-44)	(45-49)	(50-54)	(55-59)	(60-64)	Count	Earnings		Earnings									
Education Attainment (EDrecode)	ED	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	2016 \$\$ State of FLA	Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$		
High School or Below - no diploma	1	42938	3	31145	11	62290	13	50696	12	62134	10	52802	18	74631	12	58807	5	84	\$2,177,215	1,500,000	\$1,677,982	
HS Diploma	2	34668	8	56229	19	51278	28	61563	46	63362	45	63922	66	60835	60	76115	30	302	\$2,339,860	2,000,000	\$2,237,310	
some college, no diploma	3	45626	9	52946	25	63877	24	51144	36	62290	48	65140	52	63882	44	73272	50	288	\$2,390,885	2,300,000	\$2,572,906	
Associate's Degree	4	48116	10	45626	11	65905	14	65905	15	65493	16	66722	20	56628	22	95261	14	122	\$2,548,280	2,300,000	\$2,572,906	
Bachelor's Degree	5	60,834	33	65474	55	84560	52	69521	48	83054	47	73710	55	103817	43	70974	27	360	\$3,059,720	\$366,248	3,100,000	\$3,467,830
Masters, Professional, Doctorate Degree	6	57099	5	80663	10	84482	19	80607	13	88449	12	89762	15	116547	9	96293	8	91	\$3,469,510	3,600,000	\$4,027,157	
Total		50006	68	60318	131	70643	150	62826	170	66967	178	66685	226	69745	190	74121	134	1247				

Construction Managers

Analysis: TESTS

Kruskal-Wallis Test of median differences

One Way ANOVA: Wtdwage by Factor: ED

Median Test

F Ratio: 12.361 Significant and indicates variance greater between groups caused by factor(educations).
Effect Size: 0.04743498 Cohen small to medium effect (.06 break point)

Post Hoc Non Significant differences between Education Groupings 1-4 (Ed below Bachelor's)
Tukey Significant Relationships highlighted in green below.

Significance at .000 between Grouping 1-4 versus Group 5 (Bachelor degree)
Significance at .000 between Grouping 1-4 versus Group 6 (Master, Prof, Doc degree)
Significance at .030 level between Grouping 5 and Grouping 6

Dependent Variable: WTDWAGE

Chi-Square significant in both tests at .000 level indicating median differences exist between groups.

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric

Strength of Relationship: Spearman's rho (non parametric (given reliance on median)) = .197
(for this occupation) Strength small (range .10-.29) per Cohen (1988, pp.79-81)

Coefficient of Determination: r squared=.039
only 4% variance overlap

Linear Regression

Dependent: WTDWAGE
Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
Annual earnings are a function of Education Attained and Age Group

MODEL:
WTDWAGE = 25893.212 + 8408.348 (EDrecode) + 4909.137 (Age Group)
Incremental increases in education and age impact annual earnings by \$8400 and \$4900 respectively.

Adj. R Square = .0643
Approximately 6.4% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF<10
Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .213
Age Group Standardized Beta: .173
Sig = .000 both independent variables make statistically significant unique contribution to earnings
Ed makes has a relatively higher impact on earnings than age.

ACS 2012-2016		Records	Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:														NPV	Lifetime Earnings		
			<p>1. For this occupation: Chief Exec & Legislatures - 2016 constant dollar differences indicate a \$3.2 million difference between the lowest and highest lifetime earnings among respondents. vs. Georgetown Study: \$2.5 million difference between similar groups.</p> <p>2. For this occupation: those with a Bachelor's degree earned \$300,000 more over a lifetime than the next lowest level of educational attainment. (+7.6%) vs. Georgetown Study : reported reduced earnings by \$1,500,00 for those with like groups.</p> <p>3. For this occupation: those with a Bachelor's degree earned approximately \$1.7 million more over a lifetime than those with the lowest level of education attainment (~+74.5%) vs. Georgetown Study: reported \$1.9 million differential found between like groups.</p>																	
SOC Occupation(1110XX) Recode:2																				
Chief Execs & Legislatures		342																		
General and Operations																				
		Age Grp 1 (25-29)	Age Grp 2 (30-34)	Age Grp 3 (35-39)	Age Grp 4 (40-44)	Age Grp 5 (45-49)	Age Grp 6 (50-54)	Age Grp 7 (55-59)	Age Grp 8 (60-64)	Total Count	Lifetime Earnings									
Education Attainment (EDrecode)		ED	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	2016 \$\$ State of FLA	Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$	
High School or Below - no diploma		1	42241	2	91358	2	26600	1	41527	5	105447	1	34637	2	100759	1	15	\$2,315,080	\$0	
HS Diploma		2	37318		50379	5	67168	4	50379	7	51117	17	95206	18	87921	25	91	\$2,704,400	2,600,000	\$2,908,503
some college, no diploma		3	44353	3	53857	3	111531	3	101379	11	76676	13	75712	16	88944	13	69	\$3,237,475	3,200,000	\$3,579,695
Associate's Degree		4	60455	1	60455	3	62290	1	201518	3	66511	4	142496	4	63580	8	27	\$3,752,925	3,000,000	\$3,355,964
Bachelor's Degree		5	28,247	2	60834	3	86899	9	102604	14	116600	17	143128	23	157065	18	105	\$4,039,175	4,500,000	\$5,033,947
Masters, Professional, Doctorate Degree		6	122422	2	75065	2	103419	7	129582	4	394505	5	42938	5	120911	3	35	\$5,551,425	5,100,000	\$5,705,140
Total			43297	10	58440	18	86899	25	82112	44	79202	57	105603	68	97918	68	342			
color denotes value derived from total proportional change to next age group.																				

Chief Executives & Legislatures, General

Analysis: TESTS

Kruskal-Wallis Test

Median Test

Chi-Square: significant for both tests, indicating differences in medians across all six education groupings.

One Way ANOVA: WTDWAGE by Factor: ED

Rationale: One independent variable (education) with multiple levels and different participants, one dependent continuous variable (wtd wage)

Comparison of Means

F Ratio: 5.162 Significant and indicates variance greater between groups caused by factor(educations).
Effect Size: 0.071343069 Cohen **medium** effect (.06 break point)

Post Hoc

Tukey Significant differences exist between Group 5 (Bach) and Group 6 (Mas+) versus Group 1 (below HS) and Group 2 (HS)
Non significant at .05 level between other ED Groups.

Non significant at .05 level between Group 4 (Assoc) and all other Group ED levels

Dependent Variable:
WTDWAGE

Significant Relationships
highlighted in green

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric

Strength of Relationship: Spearman's rho (non parametric (given reliance on median) = .330
(for this occupation) Strength medium (range .30-.49) per Cohen (1988, pp.79-81)

Coefficient of Determination: r squared= .109
10.9% variance overlap

Linear Regression

Dependent: WTDWAGE
Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
Annual earnings are a function of Education Attained and Age Group

MODEL:
WTDWAGE = 12323 + 18646 (EDrecode) + 8487 (Age Group)
Incremental increases in education and age impact annual earnings by \$18000 and \$8500 respectively.

Adj. R Square = .078
Approximately 7.8% of earnings variance is determined by education level and age

Collinearity: Tolerance > .10 / VIF < 10
Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .253
Age Group Standardized Beta: .143
Sig = .000 education as independent variable makes a statistically significant unique contribution to earnings
Sig = .006 Age as independent variable makes a statistically significant unique contribution to earnings.

ACS 2012-2016		Records	Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																			
State of Florida	960,000		1. For this occupation: Con Laborers - 2016 constant dollar differences indicate a \$500,000 difference between the lowest and highest lifetime earnings among respondents.																			
State of Florida (Age 24-65)	490,000		vs. Georgetown Study: \$340,000 difference between similar groups.																			
State of Florida (Age 24-65) Employed	180,000		2. For this occupation: those with a Bachelor's degree earned \$170,000 more over a lifetime than the next lowest level of educational attainment. (+14.5%)																			
State of Florida (Age 24-65) Employed in Construction Industry	15,415		vs. Georgetown Study : no differential found between like groups.																			
Employed min wage floor in Construction	13,108		3. For this occupation: those with a Bachelor's degree earned approximately \$460,000 more over a lifetime than those with the lowest level of education attainment (~+39.5%)																			
			vs. Georgetown Study: \$340,000 differential found between like groups.																			
SOC Occupation(472061) Recode:324																						
Con Laborers	1532																					
Education Attainment (EDrecode)	ED	Age Grp 1 (25-29)		Age Grp 2 (30-34)		Age Grp 3 (35-39)		Age Grp 4 (40-44)		Age Grp 5 (45-49)		Age Grp 6 (50-54)		Age Grp 7 (55-59)		Age Grp 8 (60-64)		Total Count	Lifetime Earnings	NPV	Lifetime Earnings	
		Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	2016 \$\$ State of FLA	Payoff Study All US 2009 \$\$		Payoff Study All US 2016 \$\$	
High School or Below - no diploma	1	25267	64	25348	84	28626	77	30228	82	31145	53	30417	56	30417	23	31577	20	459	\$1,165,125		1,000,000	\$1,118,655
HS Diploma	2	29898	98	30670	94	31235	81	31145	96	38412	109	32445	89	34473	59	30414	31	657	\$1,293,460		1,200,000	\$1,342,386
some college, no diploma	3	29220	27	30544	32	30670	34	34760	35	38645	32	37121	36	50379	39	41718	12	247	\$1,465,285		1,300,000	\$1,454,251
Associate's Degree	4	31664	12	35400	8	38338	10	33479	10	25954	10	52559	12	39296	10	34491	4	76	\$1,455,905		1,300,000	\$1,454,251
Bachelor's Degree	5	31,145	5	30954	6	50689	15	36961	7	32589	14	51624	4	39217	10	51745	10	71	\$1,624,620	\$90,088	1,300,000	\$1,454,251
Masters, Professional, Doctorate Degree	6	20152	4	51908	1	70531	1	38087	3	54538	2	38931	5	39450	5	20151	1	22	\$1,668,740			\$0
Total		27331	210	30228	225	30670	218	31145	233	34616	220	32445	202	37121	146	32691	78	1532				
color denotes value derived from total proportional change to next age group.																						

Laborers

Analysis: TESTS

Kruskal-Wallis Test: Test for differences of medians

One Way ANOVA: Wtdwage by Factor: ED

F Ratio: 10.844 Significant and indicates variance greater between groups caused by factor(educations).
 Effect Size: 0.034308943 Cohen small effect (.06 break point)
 Post Hoc: Significant differences exist between Group 1 versus all other ED groupings exc Group 3 (Assoc)
 Tukey: Non significant at .05 level between Group 4 (Assoc) and all other Group ED levels

Median

Dependent Variable:
WTDWAGE

Significant Relationships
highlighted in green

Chi-Square significant in both test at .05 level, indicating differences in medians between groupings exists.

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
 Strength of Relationship: Spearman's rho (non parametric (given reliance on median) = .198 (for this occupation) Strength small (range .10-.29) per Cohen (1988, pp.79-81)
 Coefficient of Determination: r squared=.039 3.9% variance overlap

Linear Regression

Dependent: WTDWAGE
Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
Annual earnings are a function of Education Attained and Age Group

MODEL:
WTDWAGE = 22641.663 + 3873.352 (EDrecode) + 1770.065 (Age Group)
Incremental increases in education and age impact annual earnings by \$3800 and \$1800 respectively.

Adj. R Square = .045
Approximately 4.5% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF<10
Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .155
Age Group Standardized Beta: .130
Sig = .000 both independent variables make statistically significant unique contribution to earnings
Ed makes has a relatively higher impact on earnings than age.

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																		
State of Florida		960,000		<p>1. For this occupation: Cost Estimators- Education Group 1 (below HS) and Group 5 (Bachelors) reported nearly identical lifetime earnings and reported the highest overall earnings. vs. Georgetown Study:reported earnings for only two Education Groups: Group 3 (Some College) and Group 5 (Bachelor's)</p> <p>2. For this occupation: those with a Bachelor's degree earned \$900,000 more over a lifetime than the next lowest level of educational attainment. ('39%) vs. Georgetown Study : \$600,000 differential found between like groups. Difference of \$300,000 over a lifetime.</p> <p>3. For this occupation: those with a Bachelor's degree earned approximately \$1.4 million more over a lifetime than those with the lowest level of earnings (Group 2 HS)(**+69%) vs. Georgetown Study: \$550,000 differential found between those groups reported.</p>																		
State of Florida (Age 24-65)		490,000																				
State of Florida (Age 24-65)																						
Employed		180,000																				
State of Florida (Age 24-65)																						
Employed in Construction Industry		15,415																				
Employed min wage floor in Construction		13,108																				
SOC Occupation(131051)																						
Recode:35																						
Cost Estimators		183																				
Education Attainment (EDrecode)	ED	Age Grp 1 (25-29)		Age Grp 2 (30-34)		Age Grp 3 (35-39)		Age Grp 4 (40-44)		Age Grp 5 (45-49)		Age Grp 6 (50-54)		Age Grp 7 (55-59)		Age Grp 8 (60-64)		Total Count	Lifetime Earnings	NPV	Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$
		Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	2016 \$\$ State of FLA	Lifetime Earnings			
High School or Below - no diploma	1	106461	1	124890		102273	1	77057		81422		79202	1	45931	2	61993		5	\$3,396,145			\$0
HS Diploma	2	39918	5	45626	3	46468	2	47099	5	53236	8	48586	13	50966	10	56229	3	49	\$1,940,640			\$0
some college, no diploma	3	43188	5	56615	6	50095	4	53054	8	77090	5	71525	14	87650	5	93435	3	50	\$2,663,260		2,200,000	\$2,461,041
Associate's Degree	4	42584	5	78592	1	49948	2	51909	3	66501	5	53162	1	44983	3	82810	2	22	\$2,352,445			\$0
Bachelor's Degree	5	45,341	6	63464	4	84482	9	95043	7	126724	1	81113	7	80856	3	78474	6	43	\$3,277,485	\$644,880	2,700,000	\$3,020,368
Masters, Professional, Doctorate Degree	6	60318	1	59176	2	51117	1	63362	1	75537	2	61341	1	20278	1	67481	1	10	\$2,293,050			\$0
Total		45341	23	53190	16	73922	19	54038	24	57099	21	56061	37	53402	24	67481	19	183				
color denotes value derived from total proportional change to next age group.																						

Cost Estimators

Analysis: TESTS
 Kruskal-Wallis Test of differences between medians

One Way ANOVA: Wtdwage by Factor: ED

Median

F Ratio: 2.91 Significant to the .015 level, indicates variance greater between groups caused by factor(educations).
 Effect Size: 0.075961905 Cohen medium effect (.06 break point)

Post Hoc Tukey Significant differences exist between Group 2 versus Group 5 (Bachelor)
 Non significant at .05 level between all other Groups
 Dependent Variable: WTDWAGE

Significant Relationships highlighted in green

Chi-Square tests are both significant to the .001 level, indicating significant differences exist between groupings.

Correlation Analysis
 Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
 Strength of Relationship: Spearman's rho (non parametric (given reliance on median) = .224
 (for this occupation) Strength small (range .10-.29) per Cohen (1988, pp.79-81)
 Coefficient of Determination: r squared= .050
 5.0% variance overlap

Linear Regression
 Dependent: WTDWAGE
 Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
 Annual earnings are a function of Education Attained and Age Group
 MODEL:
 WTDWAGE = 30682 + 5334 (EDrecode) + 3959 (Age Group)
 Incremental increases in education and age impact annual earnings by \$5300 and \$4000 respectively.
 Adj. R Square = .064
 Approximately 6.4% of earnings variance is determined by education level and age
 Collinearity: Tolerance >.10 / VIF<10
 Actual calculations within range indicating lack of multicollinearity
 EDrecode Standardized Beta: .192
 Age Group Standardized Beta: .231
 ED significant at .009 level and makes statistically significant unique contribution to earnings
 Age significant at .002 level and makes a significant and unique contribution to earnings.

3	.047	7.690	.99	.67	.47
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a. Dependent Variable: WTDWAGE

ACS 2012-2016		Records	Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																												
State of Florida		960,000	1. For this occupation: Truck Drivers , 2016 constant dollar differences indicate a \$300,000 difference between the lowest and highest lifetime earnings among respondents. vs. Georgetown Study: \$330,000 difference between highest and lowest earning groups.																												
State of Florida (Age 24-65)		490,000																													
State of Florida (Age 24-65) Employed		180,000														2. For this occupation: those in Group 1 (below HS) earned the highest level of lifetime exceeding earnings across all other educational attainment groups.															
State of Florida (Age 24-65) Employed in Construction Industry		15,415	vs. Georgetown Study : Reported no differential in lifetime earnings between Group 4 (Associate's) and Group 5 (Bachelor's)																												
Employed min wage floor in Construction		13,108	3. Both studies excluded earnings in Masters++ education levels, given lack of representative information. vs. Georgetown Study: included reported earnings in Group 5 (Bachelor's)																												
SOC Occupation(533030) Recode:452																															
Drivers, Sales & Truck		243																													
		Age Grp 1	Age Grp 2		Age Grp 3		Age Grp 4		Age Grp 5		Age Grp 6		Age Grp 7		Age Grp 8		Total	Lifetime	NPV		Lifetime										
		(25-29)	(30-34)		(35-39)		(40-44)		(45-49)		(50-54)		(55-59)		(60-64)		Count	Earnings			Earnings										
Education Attainment (EDrecode)		ED	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count		2016 \$\$ State of FLA		Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$										
High School or Below - no diploma		1	49401	2	31149	6	42529	5	49313	4	39772	16	36899	14	35479	4	37911	10	61	\$1,612,265		1,300,000	\$1,454,251								
HS Diploma		2	26219	8	29993	12	39450	17	32737	19	45626	19	38467	18	29220	23	40894	13	129	\$1,413,030		1,500,000	\$1,677,982								
some college, no diploma		3	34510	4	25120	2	35487	3	30107	11	33203	6	36184	2	30228	3	35266	5	36	\$1,300,525		1,600,000	\$1,789,848								
Associate's Degree		4	31930		30417	1	40557		33371		30832	7	62055	2	37129	2	25954	1	13	\$1,461,225	N/A	1,500,000	\$1,677,982								
Bachelor's Degree (4 records excluded)		5																	0	\$0		1,500,000	\$1,677,982								
Masters, Prof, Doc (0 records reported)																			0	\$0			\$0								
Total			31930	14	30417	21	40557	25	33371	34	39908	48	37411	36	29220	32	35266	29	239												
			denotes values extrapolated based on proportional relationships																												

Drivers, Sales & Truck

Kruskal-Wallis Test for differences in medians

One Way ANOVA: Wtdwage by Factor: ED

Median

		Frequencies				
		HS or below	HS Diploma or equiv	EDrecode Some College	Assoc Degree	Bachelor's Degree
WTDWAGE	> Median	38	60	17	4	0
	<= Median	23	69	19	9	0

Chi-Square tests: Neither test provides values of significance at .001 level. (Kruskal-Wallis at .035)
Both indicate there are **not significant** differences between median groupings.

F Ratio: 1.569
Effect Size: 0.019636421
Not Significant, indicating variances between means does nto exist
Cohen very small effect (.06 break point to medium effect)

Post Hoc
Tukey
Dependent Variable:
WTDWAGE
Not Significant differences exist between all group means

Significant Relationships highlighted in green

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: **NEGATIVE**: as Education increases, wages **decrease** - both Parametric and Nonparametric
Strength of Relationship: (for this occupation) Spearman's rho (non parametric (given relaince on median)) = -.182
Strength small (range .10-.29) per Cohen (1988, pp.79-81)
Coefficient of Determination: r squared= .033
only 3.3% variance overlap

Linear Regression

Dependent: WTDWAGE
Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
Annual earnings are a function of Education Attained and Age Group
MODEL:
WTDWAGE = 40153 - 1873 (EDrecode) + 367(Age Group)
Incremental increases in education annual earnings by \$1800. Incremental increases in age increase annual earnings by \$400
Adj. R Square = .002
Approximately .2% of earnings variance is determined by education level and age
Collinearity: Tolerance >.10 / VIF<10
Actual calculations within range indicating lack of multicollinearity
EDrecode Standardized Beta: -.091
Age Group Standardized Beta: .045
ED coefficient is **not significant**. This variable does not contribute a unique and significant impact on earnings.
Age coefficient is **not significant** at .000 level and does not contribute a unique and significant impact on earnings.

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:												NPV		LifETIME								
				1. For this occupation: Electrician Rev1 - 2016 constant dollar differences indicate a \$980,000 difference between the lowest and highest lifetime earnings among responenets. vs. Georgetown Study: \$780,000 difference between highest and lowest earning groups. 2. For this occupation: those with a Bachelor's degree earned \$730,000 more over a lifetime than the next lowest level of educational attainment. vs. Georgetown Study : \$300,000 differential found those with a Bachelor's degree earned LESS. Both studies excluded earnings in Masters++ education levels, given lack of representatice information.																						
		Age Grp 1		Age Grp 2		Age Grp 3		Age Grp 4		Age Grp 5		Age Grp 6		Age Grp 7		Age Grp 8		Total		LifETIME		NPV		LifETIME		
		(25-29)		(30-34)		(35-39)		(40-44)		(45-49)		(50-54)		(55-59)		(60-64)		Count		Earnings				Earnings		
Education Attainment (EDrecode)		ED	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	2016 \$\$ State of FLA				Payoff Study All US 2009 \$\$		Payoff Study All US 2016 \$\$	
High School or Below - no diploma		1	27205	7	29648	10	33159	15	31235	8	39543	19	40871	14	32715	5	35266	5	83	\$1,348,210			1,400,000	\$1,566,117		
HS Diploma		2	29239	39	32715	47	33793	41	40129	49	40557	70	41923	64	42822	46	46005	23	379	\$1,535,915			1,800,000	\$2,013,579		
some college, no diploma		3	33221	23	32445	27	38153	44	39790	22	40934	26	45294	32	51909	21	38892	12	207	\$1,603,190			2,000,000	\$2,237,310		
Associate's Degree		4	32183	8	41008	5	35487	9	46574	8	42241	13	45119	11	48051	8	27173	1	63	\$1,589,180			2,100,000	\$2,349,175		
Bachelor's Degree		5	93,360	2	30417	7	48617	6	46752	7	50379	7	39450	7	34828	2	120910	1	39	\$2,323,565	\$409,899		1,800,000	\$2,013,579		
																			0	\$0				\$0		
Total			30418	79	31558	96	35782	115	39373	94	40894	135	42452	128	45341	82	43866	42	771							

Electricians

Analysis: TESTS

Kruskal-Wallis Test for differences in medians

One Way ANOVA: Wtdwage by Factor: ED

F Ratio: 4.01 Significant and indicates variance greater between groups caused by factor(educations).
Effect Size: 0.02051252 Cohen small effect (.06 break point)

Median

Non Significant differences exist between most groups

Post Hoc Significance at .004 between Group 1 versus Group 3 (less than HS vs. Some college)
Tukey Significance at .042 between Grouping 2 versus Group 3 (HS vs. Some College)
Dependent Variable: WTDWAGE

Chi-Square both tests significant to the .005 level, indicating differences between median groupings.

Significant Relationships highlighted in green

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
Strength of Relationship: Spearman's rho (non parametric (given reliance on median) = .126
(for this occupation) Strength small (range .10-.29) per Cohen (1988, pp.79-81)
Coefficient of Determination: r squared=.016
only 1.6% variance overlap

Linear Regression

Dependent: WTDWAGE
Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
Annual earnings are a function of Education Attained and Age Group

MODEL:
WTDWAGE = 27143.532 + 3030.139 (EDrecode) + 1787.912 (Age Group)
Incremental increases in education and age impact annual earnings by \$3000 and \$1800 respectively.

Adj. R Square = .035
Approximately 3.5% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF<10
Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .124
Age Group Standardized Beta: .154
Sig = .000 both independent variables make statistically significant unique contribution to earnings
Ed makes has a relatively higher impact on earnings than age.

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																		
State of Florida	960,000	1. For this occupation: Eqmt Operators - 2016 constant dollar differences indicate a \$125,000 difference between the lowest and highest lifetime earnings among respondents.																				
State of Florida (Age 24-65)	490,000	vs. Georgetown Study: 550,000 difference between highest and lowest earning groups. Difference between findings: \$400,000																				
State of Florida (Age 24-65) Employed	180,000	2. Both studies excluded earnings in three levels of education attainment, given lack of representative information.																				
State of Florida (Age 24-65) Employed in Construction Industry	15,415	Groups excluded: Group 4 (Assoc) Group 5 (Bachelor's) and Group 6 (Master's+) - 11 records total Final N= 265																				
State of Florida (Age 24-65) Employed min wage floor in Construction	13,108																					
SOC Occupation(47207X)		Recode:326																				
Eqmt Operators excl. Pavement & Tamp Eqmt.		276																				
Education Attainment (EDrecode)	ED	Age Grp 1 (25-29)		Age Grp 2 (30-34)		Age Grp 3 (35-39)		Age Grp 4 (40-44)		Age Grp 5 (45-49)		Age Grp 6 (50-54)		Age Grp 7 (55-59)		Age Grp 8 (60-64)		Total	Lifetime	NPV	Lifetime	
		Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Count	Earnings		Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$
High School or Below - no diploma	1	32341	8	32215	10	34473	13	29443	14	36961	15	43326	9	40280	12	46005	9	90	\$1,475,220		1,400,000	\$1,566,117
HS Diploma	2	36059	12	34760	11	33942	14	41527	18	36273	17	40304	19	40894	31	40343	20	142	\$1,520,510		1,600,000	\$1,789,848
some college, no diploma	3	31938	4	32428	4	21594	5	38017	5	27172	4	45837	6	40713	2	81787	3	33	\$1,597,430		1,800,000	\$2,013,579
Associate's Degree (7 records excluded)	4																	0	\$0			\$0
Bachelor's Degree (3 records excluded)	5																	0	\$0	N/A		\$0
Masters, Prof, Doc (1 record excluded)	6																	0	\$0			\$0
Total		32983	24		25	33869	32	36273	37		36		34	40868	45	41474	32	265				

Equipment Operators excl. Paving

Analysis: TESTS

Kruskal-Wallis Test for differences in medians

One Way ANOVA: Wtdwage by Factor: ED

F Ratio: 0.388 **Not Significant** at the .001 level indicating variances between means does not exist
 Effect Size: 0.002956948 Cohen negligible effect (.06 break point to medium effect)

Median

Post Hoc
 Tukey **No significant** variances in means exist between any group.
 Dependent Variable:
 WTDWAGE

Significant Relationships highlighted in green

Chi-Square tests: Both test values are non significant at .001 and .05 level. Both indicate there are **not significant** differences between median groupings.

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
 Strength of Relationship: (for this occupation) Spearman's rho (non parametric (given reliance on median) = .091
 Strength small (range .10-.29) per Cohen (1988, pp.79-81)
 Coefficient of Determination: r squared=.008
 only 0.8% variance overlap
 Note: Pearson correlation is **not significant**
 Spearman rho significant at .142 level

Linear Regression

Dependent: WTDWAGE
 Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
 Annual earnings are a function of Education Attained and Age Group

MODEL:
 WTDWAGE = 29858 + 1582 (EDrecode) + 2463 (Age Group)
 Incremental increases in education negatively impact annual earnings by \$1500.
 Incremental increases in age positively impact annual earnings by \$2400

Adj. R Square = .013
 Approximately 1.3% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF<10
 Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: -.027
 Age Group Standardized Beta: .141
 ED coefficient is **not significant at .662 level**. This variable **does not** contribute a unique and significant impact on earnings.
 Age coefficient is **significant at .022 level** and makes a unique impact on earnings.

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																			
State of Florida		960,000		<p>1. For this occupation: RPR HVAC - 2016 constant dollar differences indicate a \$200,000 difference between the lowest and highest lifetime earnings among respondents. vs. Georgetown Study: \$225,000 difference between highest and lowest earning groups.</p> <p>2. For this occupation: those in Group 4 (Associate's) earned the highest level of lifetime exceeding earnings of those with the next highest level of educational attainment (Bachelor's). vs. Georgetown Study : Reported no differential in lifetime earnings between Group 3 (Some College) and Group 4 (Associate's)</p> <p>3. Both studies excluded earnings in Masters++ education levels, given lack of representative information. vs. Georgetown Study: excluded earnings in 3 Groups: Group 1 (below HS), Group 5 (Bachelor's) and Group 6 (Master's+)</p>																			
State of Florida (Age 24-65)		490,000																					
State of Florida (Age 24-65) Employed		180,000																					
State of Florida (Age 24-65) Employed in Construction Industry		15,415																					
Employed min wage floor in Construction		13,108																					
SOC Occupation(499021) Recode:369																							
RPR HVAC		587																					
Education Attainment (EDrecode)		ED	Age Grp 1 (25-29)		Age Grp 2 (30-34)		Age Grp 3 (35-39)		Age Grp 4 (40-44)		Age Grp 5 (45-49)		Age Grp 6 (50-54)		Age Grp 7 (55-59)		Age Grp 8 (60-64)		Total Count	Lifetime Earnings	NPV	Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$
High School or Below - no diploma	1	29404	4	30417	15	41416	4	31145	9	41527	9	42319	7	44828	10	51117	3	61	\$1,560,865			\$0	
HS Diploma	2	30323	36	41892	36	42179	41	42319	43	43101	50	51302	36	41224	26	49422	14	282	\$1,708,810		1,600,000	\$1,789,848	
some college, no diploma	3	34980	20	40303	27	40304	32	38632	14	46005	19	43603	17	48158	20	48262	7	156	\$1,701,235		1,800,000	\$2,013,579	
Associate's Degree	4	40318	10	50696	5	41822	6	37081	10	30670	7	58379	6	46935	8	45953	4	56	\$1,759,270		1,800,000	\$2,013,579	
Bachelor's Degree	5	47,344	2	43091	2	46005	3	40304	1	44566	8	30417	7	36501	4	44891	2	29	\$1,665,595	(\$39,438)	0	\$0	
Masters, Prof, Doc (3 records excluded)																		0	\$0			\$0	
Total		31686	72	38471	85	41210	86	38529	77	41527	93	49072	73	46349	68	48465	30	584					

HVAC

Kruskal-Wallis Test for differences in medians

One Way ANOVA: Wtdwage by Factor: ED

F Ratio: 1.21
 Effect Size: 0.008286632 **Not Significant**, indicating variances between means does nto exist
 Cohen extremely small effect (.06 break point to medium effect)

Median

Post Hoc Tukey **Not Significant** differences exist between all group means
 Dependent Variable: WTDWAGE

Chi-Square tests: Neither test provides values of significance. Both indicate there are **not significant** differences between median groupings.

Significant Relationships highlighted in green

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
 Strength of Relationship: Spearman's rho (non parametric (given relaince on median) = .072
 (for this occupation) Strength extremely mall (range .10-.29) per Cohen (1988, pp.79-81)
 Coefficient of Determination: r squared=.005
 only .5% variance overlap

Linear Regression

Dependent: WTDWAGE
 Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
 Annual earnings are a function of Education Attained and Age Group

MODEL:
 WTDWAGE = 35716 + 759 (EDrecode) + 1803(Age Group)
 Incremental increases in education and age impact annual earnings by \$800 and \$1800 respectively.

Adj. R Square = .022
 Approximately 2.2% of earnings variance is determined by education level and age

Collinearity: Tolerance > .10 / VIF<10
 Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .031
 Age Group Standardized Beta: .155
 ED coefficient is **not significant**. This variable does not contribute a unique and significant impact on earnings.
 Age coefficient is significant at .000 level and makes a unique impact on earnings.

a. Dependent Variable: WTDWAGE

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																			
State of Florida		960,000		1. For this occupation: First Line Supervision - 2016 constant dollar differences indicate a \$1.3 million difference between the lowest and highest lifetime earnings among respondents. vs. Georgetown Study: \$670,000 difference between similar groups. 2. For this occupation: those with a Bachelor's degree earned nearly the same over a lifetime than the next lowest level of educational attainment. vs. Georgetown Study : \$ negligible differential found between like groups over a lifetime. 3. For this occupation: those with a Bachelor's degree earned approximately \$460,000 more over a lifetime than those with the lowest level of education attainment (~+27%) vs. Georgetown Study: \$680,000 differential found between like groups. Difference: \$200,000 over a lifetime.																			
State of Florida (Age 24-65)		490,000																					
State of Florida (Age 24-65) Employed		180,000																					
State of Florida (Age 24-65) Employed in Construction Industry		15,415																					
Employed min wage floor in Construction		13,108																					
SOC Occupation(471011) Recode:319																							
First Line Supervision		1256																					
		Age Grp 1 (25-29)		Age Grp 2 (30-34)		Age Grp 3 (35-39)		Age Grp 4 (40-44)		Age Grp 5 (45-49)		Age Grp 6 (50-54)		Age Grp 7 (55-59)		Age Grp 8 (60-64)		Total Count	Lifetime Earnings	NPV	Lifetime Earnings		
Education Attainment (EDrecode)		ED	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count		2016 \$\$ State of FLA	Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$	
High School or Below - no diploma		1	32010	8	34980	20	39808	22	50610	36	49884	34	42401	32	50696	23	44207	10	185	\$1,722,980	1,700,000	\$1,901,713	
HS Diploma		2	40606	25	45140	40	47439	58	52395	79	50030	68	56229	95	52395	85	52152	56	506	\$1,981,930	2,000,000	\$2,237,310	
some college, no diploma		3	36544	17	46718	35	45626	41	52802	33	49105	47	50748	54	64428	44	68234	42	313	\$2,071,025	2,200,000	\$2,461,041	
Associate's Degree		4	40396	8	47318	12	46995	16	47521	13	60835	16	62151	10	60455	17	57099	7	99	\$2,113,850	2,200,000	\$2,461,041	
Bachelor's Degree		5	49,372	10	58228	12	52801	17	60835	17	57433	21	61250	17	42241	16	54245	14	124	\$2,182,025	\$77,946	2,300,000	\$2,572,906
Masters, Professional, Doctorate Degree		6	40303	3	102260	2	94510	2	42319	3	79202	5	76984	6	91691	6	81211	2	29	\$3,042,400		\$0	
Total			40304	71	45341	121	45626	156	51908	181	52724	191	52355	214	52724	191	57099	131	1256				

First Line Supervision

Analysis: TESTS

Kruskal-Wallis Test of Differences in Medians

One Way ANOVA: Wtdwage by Factor: ED

F Ratio: 7.097 Significant and indicates variance greater between groups caused by factor(educations).
 Effect Size: 0.027602622 Cohen small effect (.06 break point)

Median Test

Post Hoc Non Significant differences between Education Groupings 4 (Assoc) and all other groups excluding Masters+
 Tukey Non Significant differences between Education Groupings 5 (BS/BA) and all other groups excluding below HS
 Significance at .000 between Grouping 1-5 versus Group 6 (Ma++ degrees)
 Dependent Variable: WTDWAGE

Chi-Square significant in both tests, indicating significant differences in group medians.

Significant Relationships highlighted in green

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
 Strength of Relationship: (for this occupation) Spearman's rho (non parametric (given reliance on median) = .128
 Strength small (range .10-.29) per Cohen (1988, pp.79-81)
 Coefficient of Determination: r squared=.016
 only 1.6% variance overlap

Linear Regression

Dependent: WTDWAGE
 Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
 Annual earnings are a function of Education Attained and Age Group

MODEL:
 WTDWAGE = 28293.079 + 5128.101 (EDrecode) + 3956.269 (Age Group)
 Incremental increases in education and age impact annual earnings by \$5100 and \$4000 respectively.

Adj. R Square = .043
 Approximately 64.3% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF<10
 Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .133
 Age Group Standardized Beta: .167
 Sig = .000 both independent variables make statistically significant unique contribution to earnings
 AGE makes has a relatively higher impact on earnings than age.

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:												NPV		Lifetime							
				1. For this occupation: Managers, General & Ops- 2016 constant dollar differences indicate a \$3.9 million difference between the lowest and highest lifetime earnings among responents. vs. Georgetown Study: \$1.8 million difference between similar groups.																					
				2. For this occupation: those with a Master's degree earned the highest level of lifetime earnings and \$1.3 million over those in Group 5 (Bachelor's). vs. Georgetown Study :those with a Master's + degree earned \$700,000 over Group 5 (Bachelor's) .																					
				3. For this occupation: beyond Group 5 (Bachelor's), earned over double (\$2.5 million) over the next lowest ED attainment level , Group 4 (Assoc). (~+102%) vs. Georgetown Study: Group 5 (Bachelor) earned \$800,000 over the next lowest ED attainment level, Group 4 (Assoc) (+32%)																					
SOC Occupation(111021) Recode:3				Neither study reported earnings in Group 1 (below HS). This study required a relatively arge number of extrapolations.																					
Managers, General & Operations		118																							
CONSTRUCTION		Age Grp 1		Age Grp 2		Age Grp 3		Age Grp 4		Age Grp 5		Age Grp 6		Age Grp 7		Age Grp 8		Total		Lifetime		NPV		Lifetime	
		(25-29)		(30-34)		(35-39)		(40-44)		(45-49)		(50-54)		(55-59)		(60-64)		Count		Earnings				Earnings	
Education Attainment (EDrecode)		ED	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count		2016 \$\$ State of FLA		Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$		
H. S. or Below - no dipl (5 records excl.)		1																	0	\$0			\$0		
HS Diploma		2	64538		87772		58807	3	57793	5	68946	1	105797	7	62290	5	122681	3	24	\$3,143,120		2,200,000	\$2,461,041		
some college, no diploma		3	41713	1	81113	1	49832	5	30670	1	60683	6	53985	7	93706	7	124580	3	31	\$2,681,410		2,500,000	\$2,796,637		
Associate's Degree		4	49960		67932	2	42758	2	52144		55765	8	50689	1	49280		127793	3	16	\$2,481,605		2,500,000	\$2,796,637		
Bachelor's Degree		5	81,787	1	83964	2	81113	7	93705	9	76825	3	394505	1	105078	4	90048	4	31	\$5,035,125	\$853,628	3,300,000	\$3,691,561		
Mas, Prof, Doc Degree		6	82888		112706		75569	1	121717	4	153665	4	204468	1	231745	1	292515		11	\$6,376,365		4,000,000	\$4,474,619		
Total			61750	2	81113	5	57388	18	82798	19	67699	22	74562	17	93706	17	122681	13	113						

color denotes value derived from total proportional change to next age group.

Managers, General & Operations

Analysis: TESTS

Kruskall-Wallis Test of differences
between medians

One Way ANOVA: Wtdwage by Factor: ED

Median

F Ratio: 2.494 **Significant** at .035 level, variance exists at low level between groups due to ED factor
Effect Size: 0.100190567 Cohen medium effect (.06 break point)

Post Hoc **No Significant** differences exist between any of the reported groups. All Groups represented.
Tukey
Dependent Variable:
WTDWAGE

Significant Relationships
highlighted in green

Chi-Square tests: both tests yield values
Significant at .003 level, indicating
significant differences exist between
groupings. (All Groups included in analysis)

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
Strength of Relationship: Spearman's rho (non parametric (given reliance on median) = .260
(for this occupation) Strength small (range .10-.29) per Cohen (1988, pp.79-81)
Coefficient of Determination: r squared=.068
6.8% variance overlap

Linear Regression

Dependent: WTDWAGE
Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
Annual earnings are a function of Education Attained and Age Group

MODEL:
WTDWAGE = -16575 + 15909 (EDrecode) + 10872 (Age Group)
Incremental increases in education and age impact annual earnings by \$16000 and \$11000 respectively.

Adj. R Square = .192
Approximately 11.9% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF<10
Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .306
Age Group Standardized Beta: .265
ED **significant** at .001 level.
Age **significant** at .003 level.

ACS 2012-2016	Records	Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations: 1. For this occupation: Painter, Paperhanger - 2016 constant dollar differences indicate a \$550,000 difference between the lowest and highest lifetime earnings among respondents. vs. Georgetown Study: \$220,000 difference between highest and lowest earning groups. Difference between findings: \$230,000 2. For this occupation: those in Group 5 (Bachelor's) earned \$500,000 above those in the next lowest level of education attainment (Associate's). vs. Georgetown Study : Reported minimal differential in lifetime earnings between all Groups reported. 3. Both studies excluded earnings in Masters++ education levels, given lack of representative information. vs. Georgetown Study: excluded earnings in 3 Groups: Group 4 (Assoc) Group 5 (Bachelor's) and Group 6 (Master's+)
State of Florida	960,000	
State of Florida (Age 24-65)	490,000	
State of Florida (Age 24-65) Employed	180,000	
State of Florida (Age 24-65) Employed in Construction Industry	15,415	
Employed min wage floor in Construction	13,108	
SOC Occupation(472140) Recode:331		

Painters and Paperhangers 456

	Age Grp 1		Age Grp 2		Age Grp 3		Age Grp 4		Age Grp 5		Age Grp 6		Age Grp 7		Age Grp 8		Total Count	Lifetime Earnings	NPV	Lifetime Earnings					
	ED	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median					Count				
High School or Below - no diploma	1	23412	17	27300	14	25954	27	22709	22	30953	20	30686	22	28085	11	32243	9	142	\$1,106,710		900,000	\$1,006,789			
HS Diploma	2	25756	18	29648	25	35266	29	31681	25	36336	36	35487	29	31795	26	44629	8	196	\$1,352,990		1,100,000	\$1,230,520			
some college, no diploma	3	30215	10	35817	8	30954	10	30063	10	25954	11	29220	11	30397	10	32715	7	77	\$1,226,675		1,000,000	\$1,118,655			
Associate's Degree	4	25345	1	23412	1	34250	6	31145	3	34473	5	30533	2	25572	2	25348	1	21	\$1,150,390			\$0			
Bachelor's Degree	5			26401	1	40304	3	27205	3	56425	3	39540	4	52444	4	88764	2	20	\$1,655,415	\$75,921	0	\$0			
Masters, Prof, Doc (4 records excluded)																		0	\$0			\$0			
Total			46		49		75		30417	63		34980	75		32391	68		30417	53		32715	27		456	

Painters and Paperhangers

Analysis: TESTS

Kruskal-Wallis Test for differences in medians

One Way ANOVA: Wtdwage by Factor: ED

F Ratio: 0.844
Effect Size: 0.00742764 **Not Significant** at the .001 level indicating variances between means does not exist
Cohen negligible effect (.06 break point to medium effect)

Median

Post Hoc
Tukey **No significant** variances in means exist between any group.
Dependent Variable:
WTDWAGE

Chi-Square tests: Both test values are significant at .001 and .034 level respectively.
Both indicate there are **significant** differences between median groupings.

Significant Relationships highlighted in green

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
Strength of Relationship: Spearman's rho (non parametric (given reliance on median) = .116
(for this occupation) Strength small (range .10-.29) per Cohen (1988, pp.79-81)
Coefficient of Determination: r squared=.013
only 1.3% variance overlap
Note: Pearson correlation is **not significant**
Spearman rho significant at .013 level

Linear Regression

Dependent: WTDWAGE
Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
Annual earnings are a function of Education Attained and Age Group

MODEL:
WTDWAGE = 27504 - 337 (EDrecode) + 2585 (Age Group)
Incremental increases in education negatively impact annual earnings by \$400.
Incremental increases in age positively impact annual earnings by \$2600
Adj. R Square = .022
Approximately 2.1% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF<10
Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: -.011
Age Group Standardized Beta: .160
ED coefficient is **not significant** at .022 level. This variable **does not** contribute a unique and significant impact on earnings.
Age coefficient is **significant** at .001 level and makes a unique impact on earnings.

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																		
State of Florida	960,000	1. For this occupation: Misc Managers - 2016 constant dollar differences indicate a \$2.6 million difference between the lowest and highest lifetime earnings among respondents. vs. Georgetown Study: \$2.8 million difference between similar groups.																				
State of Florida (Age 24-65)	490,000																					
State of Florida (Age 24-65) Employed	180,000	2. For this occupation: those with a Bachelor's degree earned \$800,000 more over a lifetime than the next lowest level of educational attainment. (~34%) vs. Georgetown Study : \$1 million differential found between like groups. Difference of \$200,000 over a lifetime.																				
State of Florida (Age 24-65) Employed in Construction Industry	15,415																					
Employed min wage floor in Construction	13,108	3. For this occupation: those with a Bachelor's degree earned approximately \$1.2 million more over a lifetime than those with the lowest level of education attainment (~+64%) vs. Georgetown Study: \$2 million differential found between like groups. Difference of \$800,000 over a lifetime.																				
SOC Occupation(119XX) Recode:28																						
Misc. Managers		833																				
Education Attainment (EDrecode)	ED	Age Grp 1 (25-29)		Age Grp 2 (30-34)		Age Grp 3 (35-39)		Age Grp 4 (40-44)		Age Grp 5 (45-49)		Age Grp 6 (50-54)		Age Grp 7 (55-59)		Age Grp 8 (60-64)		Total Count	Lifetime Earnings	NPV	Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$
		Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	2016 \$\$ State of FLA	Lifetime Earnings			
High School or Below - no diploma	1	36498	0	46718	3	39644	6	44199	12	46718	19	45140	11	60835	3	62182	0	54	\$1,909,670		1,400,000	\$1,566,117
HS Diploma	2	33376	12	44472	16	58617	24	50696	31	54751	39	60455	54	67481	30	67463	22	228	\$2,186,555		1,900,000	\$2,125,444
some college, no diploma	3	40304	9	45788	16	58785	30	53159	20	62290	31	61088	42	58273	35	58630	36	219	\$2,191,585		2,200,000	\$2,461,041
Associate's Degree	4	36804	5	40557	5	73002	7	62290	19	51513	12	61373	18	51749	8	91184	10	84	\$2,342,360		2,300,000	\$2,572,906
Bachelor's Degree	5	54,914	9	60835	19	79202	25	66411	20	88244	34	84482	45	121670	27	71449	22	201	\$3,136,035	\$454,846	3,200,000	\$3,579,695
Masters, Professional, Doctorate Degree	6	65493	1	73567	4	88490	6	135017	4	142564	13	100759	9	96728	3	201518	7	47	\$4,520,680		3,900,000	\$4,362,754
Total		40430	36	51710	63	66973	98	53906	106	66452	148	62863	179	70974	106	72546	97	833				
color denotes value derived from total proportional change to next age group.																						

Miscellaneous Managers

Analysis: TESTS

Kruskall-Wallis Test of differences between medians

One Way ANOVA: Wtdwage by Factor: ED

Median

F Ratio: 12.118 Significant and indicates variance greater between groups caused by factor(educations).
 Effect Size: 0.682527451 Cohen small to medium effect (.06 break point)

Post Hoc Significant differences exist between Group 5 & 6 versus all other ED groupings (Bach/Master+ vs. all others)
 Tukey Non significant at .05 level between Group 5 (Bachelor) and Group 6 (Master) ED levels

Dependent Variable:
 WTDWAGE

Significant Relationships highlighted in green

Chi-Square tests are both significant to the .000 level, indicating significant differences exist between groupings.

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
 Strength of Relationship: Spearman's rho (non parametric (given reliance on median) = .289
 (for this occupation) Strength small (range .10-.29) per Cohen (1988, pp.79-81)
 Coefficient of Determination: r squared=.083
 8.3% variance overlap

Linear Regression

Dependent: WTDWAGE
 Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
 Annual earnings are a function of Education Attained and Age Group

MODEL:
 WTDWAGE = 11585.731 + 13304.117 (EDrecode) + 5767.041 (Age Group)
 Incremental increases in education and age impact annual earnings by \$13300 and \$5800 respectively.

Adj. R Square = .075
 Approximately 7.5% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF<10
 Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .237
 Age Group Standardized Beta: .141
 Sig = .000 both independent variables make statistically significant unique contribution to earnings
 Ed makes has a relatively higher impact on earnings than age.

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																			
State of Florida		960,000		1. For this occupation: Pipelayer et, el. - 2016 constant dollar differences indicate a \$450,000 difference between the lowest and highest lifetime earnings among respondents. vs. Georgetown Study: \$780,000 difference between highest and lowest earning groups. Difference between findings: \$230,000 2. For this occupation: those in Group 5 (Bachelor's) earned \$220,000 above those in the next lowest level of education attainment (Associate's). vs. Georgetown Study : Reported no differential in lifetime earnings between Group 3 (Some College) and Group 4 (Associate's) 3. Both studies excluded earnings in Masters++ education levels, given lack of representative information. vs. Georgetown Study: excluded earnings in 2 Groups: Group 5 (Bachelor's) and Group 6 (Master's+)																			
State of Florida (Age 24-65)		490,000																					
State of Florida (Age 24-65) Employed		180,000																					
State of Florida (Age 24-65) Employed in Construction Industry		15,415																					
Employed min wage floor in Construction		13,108																					
SOC Occupation(472150)																							
Recode:332																							
Pipelayer, Plumbers,Pipefitters and Steamfitters																							
		573																					
		<u>Age Grp 1</u>	<u>Age Grp 2</u>	<u>Age Grp 3</u>	<u>Age Grp 4</u>	<u>Age Grp 5</u>	<u>Age Grp 6</u>	<u>Age Grp 7</u>	<u>Age Grp 8</u>	<u>Total</u>	<u>Lifetime</u>	NPV		<u>Lifetime</u>									
		(25-29)	(30-34)	(35-39)	(40-44)	(45-49)	(50-54)	(55-59)	(60-64)	Count	Earnings			Earnings									
Education Attainment (EDrecode)		ED	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	2016 \$\$ State of FLA		Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$			
High School or Below - no diploma		1	28766	16	30417	17	36649	12	36961	20	31681	22	37322	18	37920	10	29819	4	119	\$1,347,675	1,300,000	\$1,454,251	
HS Diploma		2	32445	39	34772	32	39262	34	42938	24	45368	56	45707	48	43934	34	37827	19	286	\$1,611,265	1,700,000	\$1,901,713	
some college, no diploma		3	38529	15	33855	16	43830	15	40511	16	42901	16	40557	19	47207	10	62457	4	111	\$1,749,235	1,900,000	\$2,125,444	
Associate's Degree		4	36907	3	36804	11	45341	5	33881	2	40386	4	38839	6	45626	3	36885	2	36	\$1,573,345	2,000,000	\$2,237,310	
Bachelor's Degree		5	41,182	2	50379	3	35487	3	35637	2	60835	1	49763	2	42241	4	42584	4	21	\$1,790,540	\$48,993	0	\$0
Masters, Prof, Doc (3 records excluded)																			0	\$0		\$0	
Total			35266	75	34521	79	39917	69	40129	64	40894	99	40894	93	43326	61	33450	33	573				

Pipelayer, Plumber & Steamfitter

Analysis: TESTS
Kruskal-Wallis Test for differences in medians

One Way ANOVA: Wtdwage by Factor: ED

F Ratio: 4.553 Significant at the .001 level indicating variances between means does exist
 Effect Size: 0.031066043 Cohen small effect (.06 break point to medium effect)

Median

Post Hoc: Significant differences exist between Group 1 (HS and below) and Group 2 (HS) and Group 3 (Some College)
 Tukey: No other significant variances in means exist between groups.
 Dependent Variable: WTDWAGE

Chi-Square tests: Both test values are significant at .000 level. Both indicate there are significant differences between median groupings.

Significant Relationships highlighted in green

Correlation Analysis
 Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
 Strength of Relationship: Spearman's rho (non parametric (given reliance on median) = .179 (for this occupation) Strength small (range .10-.29) per Cohen (1988, pp.79-81)
 Coefficient of Determination: r squared=.032 only 3.2% variance overlap
 Note: Pearson significant at .021 level Spearman rho significant at .01 level

Linear Regression
 Dependent: WTDWAGE
 Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
 Annual earnings are a function of Education Attained and Age Group
 MODEL:
 WTDWAGE = 32300 + 1797 (EDrecode) + 1230(Age Group)
 Incremental increases in education and age impact annual earnings by \$1800 and \$1200 respectively.
 Adj. R Square = .026 Approximately 2.6% of earnings variance is determined by education level and age
 Collinearity: Tolerance >.10 / VIF<10 Actual calculations within range indicating lack of multicollinearity
 EDrecode Standardized Beta: .095
 Age Group Standardized Beta: .142
 ED coefficient is significant at .022 level. This variable contributes a unique and significant impact on earnings.
 Age coefficient is significant at .001 level and makes a unique impact on earnings.

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																				
State of Florida		960,000		<p>1. For this occupation: Roofer - 2016 constant dollar differences indicate a \$400,000 difference between the lowest and highest lifetime earnings among respondents. vs. Georgetown Study: \$200,000 difference between highest and lowest earning groups. Difference between findings: \$200,000</p> <p>2. For this occupation: those in Group 5 (Bachelor's) earned \$350,000 above those in the next lowest level of education attainment (Associate's). vs. Georgetown Study : Reported minimal differentail in lifetime earnings between two Groups reported.</p> <p>3. Both studies excluded earnings in ED Groupings 5 (Bachelor) & Group 6 Masters++ education levels, given lack of representative information. vs. Georgetown Study: excluded earnings in 4 Groups:Group 3 (Some College), Group 4 (Assoc), Group 5 (Bachelor's), and Group 6 (Master's++)</p>																				
State of Florida (Age 24-65)		490,000																						
State of Florida (Age 24-65) Employed		180,000																						
State of Florida (Age 24-65) Employed in Construction Industry		15,415																						
Employed min wage floor in Construction		13,108																						
SOC Occupation(472181) Recode:334																								
Roofer		223																						
Education Attainment (EDrecode)		ED		Age Grp 1 (25-29)		Age Grp 2 (30-34)		Age Grp 3 (35-39)		Age Grp 4 (40-44)		Age Grp 5 (45-49)		Age Grp 6 (50-54)		Age Grp 7 (55-59)		Age Grp 8 (60-64)		Total Count	Lifetime Earnings	NPV	Lifetime Earnings	
		Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count		2016 \$\$ State of FLA		Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$
High School or Below - no diploma	1	30228	15	25776	18	30670	23	32715	17	30417	11	40894	9	30227	11	26260	4	108	\$1,235,935			1,000,000	\$1,118,655	
HS Diploma	2	31054	16	33872	14	36443	16	37964	12	40596	6	42095	8	22167	7	27883	2	81	\$1,360,370			1,200,000	\$1,342,386	
some college, no diploma	3	25190	5	26363	4	35782	4	20278	1	40868	3	42965	6	31326		30327		23	\$1,265,495				\$0	
Associate's Degree	4	31807		33473	2	55765	1	53025		60455	1	32715	1	29404	1	28467		6	\$1,625,555				\$0	
Bachelor's Degree (5 records deleted)	5																	0	\$0	N/A			\$0	
Masters, Prof, Doc (0 records reported)	6																	0	\$0				\$0	
Total		30323	36	29733	38	35266	44	33533	30	35782	21	40894	24	28801	19	27883	6	218						

Roofer

Analysis: TESTS
 Kruskal-Wallis Test for differences in medians

One Way ANOVA: Wtdwage by Factor: ED

F Ratio: 0.22 **Not Significant** at the .001 level indicating variances between means does not exist
 Effect Size: 0.003080094 Cohen negligible effect (.06 break point to medium effect)

Median

Post Hoc
 Tukey **No significant** variances in means exist between any group.
 Dependent Variable:
 WTDWAGE

Significant Relationships highlighted in green

Chi-Square tests: Neither test values are significant at either .001 and .050 level. Both indicate there is **not a significant** differences between median groupings.

Correlation Analysis
 Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
 Strength of Relationship: Spearman's rho (non parametric (given reliance on median) = .211
 (for this occupation) Strength small (range .10-.29) per Cohen (1988, pp.79-81)
 Coefficient of Determination: r squared=.044
 only 4.4% variance overlap
 Note: Pearson correlation is **not significant**
 Spearman rho significant at .002 level

Linear Regression
 Dependent: WTDWAGE
 Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
 Annual earnings are a function of Education Attained and Age Group

MODEL:
 WTDWAGE = 35743 + 1740 (EDrecode) - 574 (Age Group)
 Incremental increases in education positively impact annual earnings by \$1700.
 Incremental increases in age negatively impact annual earnings by \$600

Adj. R Square = .022
 Approximately 2.1% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF<10
 Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta:- .043
 Age Group Standardized Beta: -.037
 ED coefficient is **not significant**. This variable **does not** contribute a unique and significant impact on earnings.
 Age coefficient is **not significant**. This variable **does not** contribute a unique and significant impact on earnings.

ACS 2012-2016		Records		Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations:																		
State of Florida	960,000	1. For this occupation: Sales Representatives - 2016 constant dollar differences indicate a \$1.7 million difference between the lowest and highest lifetime earnings among respondents.																				
State of Florida (Age 24-65)	490,000	vs. Georgetown Study: \$2.2 million difference between similar groups. Difference between findings :\$400,000																				
State of Florida (Age 24-65) Employed	180,000	2. For this occupation: those with a Bachelor's degree earned \$1.1 million more over a lifetime than the next lowest level of educational attainment. (48%)																				
State of Florida (Age 24-65) Employed in Construction Industry	15,415	vs. Georgetown Study : \$1 million differential found between like groups. Nearly identical findings.																				
Employed min wage floor in Construction	13,108	3. For this occupation: those with a Bachelor's degree earned approximately \$1.5 million more over a lifetime than those with the lowest level of education attainment.																				
		vs. Georgetown Study: \$1.2 million differential found between like groups.																				
SOC Occupation(413099)		Neither study reported earnings in Group 1 (below HS) due to lack of data representation.																				
Recode:254																						
Sales Reps	191																					
Education Attainment (EDrecode)	ED	Age Grp 1 (25-29)		Age Grp 2 (30-34)		Age Grp 3 (35-39)		Age Grp 4 (40-44)		Age Grp 5 (45-49)		Age Grp 6 (50-54)		Age Grp 7 (55-59)		Age Grp 8 (60-64)		Total Count	Lifetime Earnings	NPV	Lifetime Earnings	
		Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Count	State of FLA		Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$
H. S. or Below - no dipl (2 records excl)	1																	0	\$0			\$0
HS Diploma	2	36839	2	31437	5	31145	1	48668	5	36961	5	50696	11	51909	5	81113	7	41	\$1,843,840		1,800,000	\$2,013,579
some college, no diploma	3	73256	2	52947	11	51117	3	65905	5	54768	6	80977	10	54038	12	52032	10	59	\$2,425,200		2,000,000	\$2,237,310
Associate's Degree	4	49794		50379	1	71115	4	56488	4	63835	2	45626	3	45679	5	73509	4	23	\$2,282,125		2,000,000	\$2,237,310
Bachelor's Degree	5	88,582	2	88244	9	95217	8	84092	11	105506	6	70542	7	70974	3	70531	11	57	\$3,368,440	\$948,831	2,900,000	\$3,244,099
Masters, Professional, Doctorate Degree	6	71564	1	101392	3	125023		131535		107942		58082	3	76044	1	31145	1	9	\$3,513,635		3,700,000	\$4,139,023
Total		65905	7	63362	29	71047	16	74748	25	61341	19	57757	34	54038	26	70531	33	189				
color denotes value derived from total proportional change to next age group.																						

Sales Rep

Analysis: TESTS

Kruskall-Wallis Test of differences between medians

One Way ANOVA: Wtdwage by Factor: ED

Median

F Ratio: 3.543 Significant to .004 level and indicates variance greater between groups caused by factor(educations).
 Effect Size: 0.087379266 Cohen medium effect (.06 break point)

Post Hoc Tukey Significant differences exist between Group 5 (Bachelor's) versus Group 2 (HS diploma)
 Non significant at .05 level between all other Groups
 Dependent Variable: WTDWAGE

Significant Relationships highlighted in green

Chi-Square tests are both significant to the .001 level, indicating significant differences exist between groupings. (Group 1 excluded from analysis)

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship: Positive: as Education increases, wages increase - both Parametric and Nonparametric
 Strength of Relationship: Spearman's rho (non parametric (given reliance on median) = .295 (for this occupation) Strength small (range .10-.29) per Cohen (1988, pp.79-81)
 Coefficient of Determination: r squared=.087 8.7% variance overlap

Linear Regression

Dependent: WTDWAGE
 Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)
 Annual earnings are a function of Education Attained and Age Group

MODEL:
 WTDWAGE = 23285 + 13979 (EDrecode) + 3544 (Age Group)
 Incremental increases in education and age impact annual earnings by \$14000 and \$3500 respectively.

Adj. R Square = .031
 Approximately 3.1% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF <10
 Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .197
 Age Group Standardized Beta: .085
 ED significant at .007 level and makes unique contribution to earnings.
 Age non significant at .236 level.

ACS 2012-2016	Records	Data Comparison ACS 2012-2016 (FLA only) with Georgetown Study ACS 2006-2009 (All US, 2016 adj\$) : General Calculations / Observations: 1. For this occupation: OFF Sec & Adm Asst. - 2016 constant dollar differences indicate a \$700,000 difference between the lowest and highest lifetime earnings among respondents. vs. Georgetown Study: \$550,000 difference between similar groups. 2. For this occupation: those with a Bachelor's degree earned \$130,000 more over a lifetime than the next lowest level of educational attainment. vs. Georgetown Study : reported reduced earnings by \$100,000 for those with like groups. 3. For this occupation: a substantial difference (\$500,000) existed between those having a Masters+ degree vs. a Bachelor's degree. In addition, the category of below HS exhibited notable extreme median values. vs. Georgetown Study: reported a difference of \$100,000 between Masters+ and Bachelor degree categories.
State of Florida	960,000	
State of Florida (Age 24-65)	490,000	
State of Florida (Age 24-65) Employed	180,000	
State of Florida (Age 24-65) Employed in Construction Industry	15,415	
Employed min wage floor in Construction	13,108	
Recode:301		
OFF Sec & Admin Asst	383	

Education Attainment (EDrecode)	ED	Age Grp 1		Age Grp 2		Age Grp 3		Age Grp 4		Age Grp 5		Age Grp 6		Age Grp 7		Age Grp 8		Total	Lifetime	NPV	Payoff Study All US 2009 \$\$	Payoff Study All US 2016 \$\$
		Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Median	Count	Count	Earnings			
High School or Below - no diploma	1	19401		19725	1	23116	2	43603	1	103817	1	31575	4	41527	1	58487	2	12	\$1,706,255		1,100,000	\$1,230,520
HS Diploma	2	29917	8	29129	6	31431	11	33459	15	38017	24	33763	27	29588	18	39450	23	132	\$1,323,770		1,300,000	\$1,454,251
some college, no diploma	3	26929	6	29569	15	32350	16	33872	18	35487	17	39073	17	40962	11	40129	7	107	\$1,391,855		1,300,000	\$1,454,251
Associate's Degree	4	27603	5	35782	3	35645	10	41392	10	36702	7	26701	9	46640	5	31145	5	54	\$1,408,050		1,400,000	\$1,566,117
Bachelor's Degree	5	32,414	12	32391	7	43297	7	36808	12	38776	2	32733	10	46718	9	43868	8	67	\$1,535,025	\$42,797	1,500,000	\$1,677,982
Masters, Professional, Doctorate Degree	6	30417	1	153351	1	42938	1	25190	1	54049	2	30417	1	39397	4	38908		11	\$2,073,335		1,600,000	\$1,789,848
Total		29917	32	30417	33	34473	47	35694	57	37789	53	32733	68	40633	48	40129	45	383				

color denotes value derived from total proportional change to next age group.

OFF Sec & Admin Asst.

Analysis: TESTS

Kruskal-Wallis Test

Median Test

Chi-Square: **non significant** results for both tests, indicating a lack of differences in medians across all six education groupings.

One Way ANOVA: WTDWAGE by Factor: ED

Rationale: One independent variable (education) with multiple levels and different participants, one dependent continuous variable (wtd wage)

Comparison of Means

Dependent Variable: WTD WAGE

Factor: Educaton Attainment Group

F Ratio: 1.95
 Effect Size: 0.025214239
NON Significant results at the .05 level and indicates a lack of variance between groups.
 Cohen **small** effect (.06 break point)

Post Hoc

Tukey **NO** Significant differences exist between means of any groups

Dependent Variable:
WTDWAGE

Significant Relationships
highlighted in green

Correlation Analysis

Correlation between WTDWAGE and ED

Correlation Results

Direction of Relationship:

Positive: as Education increases, wages increase - both Parametric and Nonparametric

Strength of Relationship:
(for this occupation)

Spearman's rho (non parametric (given reliance on median)) = .115
 Strength small per Cohen (1988, pp.79-81)

Coefficient of Determination:

r squared= 0.013225
 1.3% variance overlap

Linear Regression

Dependent: WTDWAGE

Independent: AgeGroup / EDrecode

Results:

WTDWAGE = f(EDrecode, AgeGroup)

Annual earnings are a function of Education Attained and Age Group

MODEL:

WTDWAGE = 23049 + 2349 (EDrecode) + 1836 (Age Group)

Incremental increases in education and age impact annual earnings by \$2300 and \$1800 respectively.

Adj. R Square = .046

Approximately 4.6% of earnings variance is determined by education level and age

Collinearity: Tolerance >.10 / VIF<10

Actual calculations within range indicating lack of multicollinearity

EDrecode Standardized Beta: .146

Age Group Standardized Beta: .194

Sig = .004 education as independent variable makes a statistically significant unique contribution to earnings

Sig = .000 Age as independent variable makes a statistically significant unique contribution to earnings.

Exhibit 4: Construction Sector Definitions

Website: [BuzzFile](#)

Sector:

Construction - General Contractors & Operative Builders sector in the U.S.

The Construction - General Contractors & Operative Builders sector covers 5 categories including Residential Construction, nec, Operative Builders, and Industrial Buildings and Warehouses. With 342,348 companies representing 3.00% of the companies in the U.S., this is one of the larger sectors. In terms of the number of companies, the Construction - General Contractors & Operative Builders sector is currently ranked 20 out of 81 sectors in the U.S.

Engineering, Accounting, Research, and Management Services sector in the U.S.

The Engineering, Accounting, Research, and Management Services sector covers 13 categories including Surveying Services, Testing Laboratories, and Facilities Support Services. With 1,160,329 companies representing 6.42% of the companies in the U.S., this is one of the largest sectors. In terms of the number of companies, the Engineering, Accounting, Research, and Management Services sector is currently ranked 5 out of 81 sectors in the U.S.

Heavy Construction, Except Building Construction, Contractor sector in the U.S.

The Heavy Construction, Except Building Construction, Contractor sector covers 4 categories including Bridge, Tunnel, and Elevated Highway, Water, Sewer, and Utility Lines, and Heavy Construction, nec. With 55,627 companies representing 0.32% of the companies in the U.S., this is a midsize sector. In terms of the number of companies, the Heavy Construction, Except Building Construction, Contractor sector is currently ranked 50 out of 81 sectors in the U.S.

Construction - Special Trade Contractors sector in the U.S.

The Construction - Special Trade Contractors sector covers 17 categories including Structural Steel Erection, Wrecking and Demolition Work, and Installing Building Equipment. With 806,455 companies representing 4.48% of the companies in the U.S., this is one of the largest sectors. In terms of the number of companies, the Construction - Special Trade Contractors sector is currently ranked 6 out of 81 sectors in the U.S.

Category:

Nonresidential Construction, nec category in the U.S.

The Nonresidential Construction, nec category (SIC 1542) is in the Construction - General Contractors & Operative Builders sector. This category has 47,091 companies across 27 industries, and employs approximately 638,715 people in the U.S.

Architectural Services category in the U.S.

The Architectural Services category (SIC 8712) is in the Engineering, Accounting, Research, and Management Services sector. This category has 38,530 companies across 4 industries, and employs approximately 271,551 people in the U.S.

Highway and Street Construction category in the U.S.

The Highway and Street Construction category (SIC 1611) is in the Heavy Construction, Except Building Construction, Contractor sector. This category has 26,252 companies across 15 industries, and employs approximately 405,188 people in the U.S.

Plumbing, Heating, Air-conditioning category in the U.S.

The Plumbing, Heating, Air-conditioning category (SIC 1711) is in the Construction - Special Trade Contractors sector. This category has 186,923 companies across 18 industries, and employs approximately 1,078,174 people in the U.S.

Concrete Work category in the U.S.

The Concrete Work category (SIC 1771) is in the Construction - Special Trade Contractors sector. This category has 41,858 companies across 17 industries, and employs approximately 326,085 people in the U.S.

Electrical Work category in the U.S.

The Electrical Work category (SIC 1731) is in the Construction - Special Trade Contractors sector. This category has 115,336 companies across 24 industries, and employs approximately 886,408 people in the U.S.

Industry:

Commercial and Office Building Contractors industry in the U.S.

The Commercial and Office Building Contractors industry is in the Nonresidential Construction, nec category, and the Construction - General Contractors & Operative Builders sector. With 11,477 companies, this industry employs approximately 146,989 people in the United States. The Commercial and Office Building Contractors industry is disproportionately concentrated in the states of Alaska, Hawaii, South Dakota, and District of Columbia.

Architectural Services category in the U.S.

The Architectural Services category (SIC 8712) is in the Engineering, Accounting, Research, and Management Services sector. This category has 39,530 companies across 4 industries, and employs approximately 271,551 people in the U.S.

General Contractor, Highway and Street Construction industry in the U.S.

The General Contractor, Highway and Street Construction industry is in the Highway and Street Construction category, and the Heavy Construction, Except Building Construction, Contract sector. With 7,889 companies, this industry employs approximately 119,453 people in the United States. The General Contractor, Highway and Street Construction industry is disproportionately concentrated in the states of Alaska, Hawaii, North Dakota, and Texas.

General Electrical Contractor industry in the U.S.

The General Electrical Contractor industry is in the Electrical Work category, and the Construction - Special Trade Contractors sector. With 24,349 companies, this industry employs approximately 320,490 people in the United States. The General Electrical Contractor industry is disproportionately concentrated in the states of Delaware, Idaho, North Dakota, and Wyoming.

Warm Air Heating and Air Conditioning Contractor industry in the U.S.

The Warm Air Heating and Air Conditioning Contractor industry is in the Plumbing, Heating, Air-conditioning category, and the Construction - Special Trade Contractors sector. With 27,526 companies, this industry employs approximately 177,922 people in the United States. The Warm Air Heating and Air Conditioning Contractor industry is disproportionately concentrated in the states of Arizona, Arkansas, Florida, and Missouri.

Concrete Work industry in the U.S.

The Concrete Work industry is in the Concrete Work category, and the Construction - Special Trade Contractors sector. With 81,382 companies, this industry employs approximately 326,806 people in the United States. The Concrete Work industry is disproportionately concentrated in the states of Arizona, Colorado, North Dakota, and South Dakota.

Electrical Work industry in the U.S.

The Electrical Work industry is in the Electrical Work category, and the Construction - Special Trade Contractors sector. With 75,049 companies, this industry employs approximately 385,797 people in the United States. The Electrical Work industry is disproportionately concentrated in the states of Alaska, Colorado, Louisiana, and North Dakota.

Exhibit 5: Interview Tool – Employer: General

Employer Interview Questions

General –

1. General Nature and Scope of Business
 - Duration of existence
 - Business Organization Structure
 - Role within industry - product and/or services provided and performed and typical suppliers, partners and, customers.
2. Current Labor Force Composition- number and type of positions
 - Exempt salaried / Hourly, Skilled and unskilled
 - Approx. Number of hires each year (growth vs. attrition)
 - Most difficult to hire / retain
3. Changing Skill Requirements due to increased technology
 - How has technology changed the nature of your business in the past 5 -10 years?
 - Have these changes had an impact on your workforce composition?
 - Have these changes had an impact on the type of skills required of your workforce?
 - Skills that are more or less Cognitive? Interactive? Manual?
4. Educational Requirements for labor force
 - Has the proportion of total hires that require post-secondary education remained the same over the past 5 - 7 years?
 - What positions typically require post-secondary education as a pre-condition to employment?

- What is the most important skill a college graduate brings to your firm? Technical or Soft? Does the school matter? Does the degree matter?
5. Recruitment Feedback based on hiring those with post-secondary education
- When you hire college graduates are they adequately trained with desired skills both technical and soft?
 - Define SuccessesDefine Gaps
 - How much training does your firm provide to augment a college education? TechnicalSoft (Interpersonal)
 - Do you have a tuition reimbursement program? Is there active utilization?
 - Do you have any relationships (either formal or informal) with post secondary institutions where you provide input into curriculums?
6. Interns
- How many each year?
 - Where do you get them?
 - What skills do you target?
 - Length of time?
 - Nature of assignment?
 - How many permanent job offers are typically made?
7. Post-Secondary Alliances
- How many and who - post secondary relationships?
 - How long?
 - Nature and Purpose of this relationship?

- What works? What doesn't?
- Have you seen the institution change anything as a result of your relationship?
- How many of your new hires come from this institution?
- Is retention higher or lower than other hires?

8. Future Trends

- How do you envision skill needs changing in the next 5-7 years?
- Source for Developing Future Skills
- Recruitment Strategies
- Moderating Factors (unions, regulations, etc.)
- Internal Training

Exhibit 6: Interviewee Attribute Sheet Detail

Interviewee List participant Attributes							Source:	Buzzfile	website	Interviewee											
Co. ID	Interviewee Role	Interviewee Education	Yrs. w/ Co.	Sector	Category	Industry	Construction Type	Year Founded	Annual Sales Revenue	Ownership Model	Organization Structure	Locations	No of Employees	Geographic Range of Work	SIC	No of Employees (actual)	Tuition Reimburse	Interns	Degree Req-Salary	Degree Reqd Hourly	Alliance
#1	Operations, VP	Bachelor	5 yrs.	General Contractor	Construction Mgmt	Multi-Family Structures	vertical	1986	\$5-10 mil.	Private-single	HQ	Single	<50	Central Fla/ SE US	??		??	Yes / 4	No	NA	No
#2	Operations, VP	HS	40 yrs.	General Contractor	Non Residential /Concrete	Commerical & Ofc Bldg	Self-perform	1999	\$200 mil	ESOP - 100%	HQ	Single	>50 / <100	Central Fla/SE US	1542	60	Yes	Yes / 4	50 /50	No	No
#3	Dir. Operations	HS, some no degree	??	Engineering & Mgmt	Architectural Servcs	Architectural Servcs	vertical	1987	\$12.7 mil	Private-partnership	HQ	Multi-FL	>50 / <100	Florida	8712	65/86	No	Yes / 2	depends	No	Yes
#4	Recruitig Specialist	??	2 yrs	Heavy Const. Contractor	Hwy & Street Const.	Hwy & Street Const.	horizontal	1988	\$556.2 mil	Public- Subsid	Subsid - HQ	East Coast	>500 / <1000	Easy Coast - Florida	1611, 2951 1623	??	Yes /	depends	No	No	
#5	Owner	Masters	10 yrs	General Contractor	Construction Mgmt	Multi-Family Structures	vertical	2009	\$12.0 mil	Private - single	HQ	Single	<50	Central FL / South US		10	N/A	No	depends	N/A	No
#6	Operations, VP	MBA	8/++	General Contractor	Industrial Bldg.& Whs	New Construct. Various	vertical	1908	\$2.6 bil	Private- single	Branch	Multi-intl	>2500	No. America / Intl	1541,1542, 8741 6512,6513	235	Yes	Yes / 10	No	No	No
#7	Operations, VP	Bachelor	4/28	General Contractor	Construction Mgmt	Multi-Family Structures	vertical	1999	\$140 mil	Private - single	HQ	Single	<50	Florida	1542	19	??	??			No
#8	Owner/CFO	Bachelor	26	Construction - Special Trades	HVAC, Plumb, Elec	Commercial & Residential	vertical	2000	\$26.7 mil	Private - single	HQ	Multi-FL	>100 / <500	Central FL	1711, 1731	250	Yes	No	No	No	No
#9	Sr. VP	Bachelor	30	Construction - Special Trades	Concrete	Concrete	horiz/vert	1987	\$14.9 mil	Private - single	HQ	Multi - SE US	>100 / <500	FL / SE US	1771	450	??	No	Yes	No	No
#10	Operations, VP	Bachelor	25	General Contractor	Non Residential	Commercial & Ofc. Bldg.	vertical	1949	\$252.6 mil	Private - Family	Branch	Multi - East US	>50 / <100	East, SE US	1542	55 /400	No	1-2	depends	No	No
#11	HR	HS, some no degree	10/18	Construction - Special Trades	Electrical	Electrical	vertical	1971	\$43.9 mil	Private - single	HQ	Single	>100 / <500	Florida	1731	150/300	depends	No	depends	No	No
#12	Operations, VP	HS, some no degree	40	Construction - Special Trades	Electrical	Electrical	vertical	2006	\$59.7 mil	Private -Partnership	Branch	Multi- SE US	>100 / <500	FL / SE US	1731	180/	depends	No	No	No	Yes

Exhibit 7: Content Analysis: Node Design Hierarchy

Name	Sources	References
▼ ● College Alliances, Connections	1	5
● Interns	1	4
● College Purpose	2	9
▼ ● Company Labor Strategies	0	0
● Labor Market - Trades Sup...	2	8
● Retention - Salaried 	2	4
● Salaried Structure	1	3
● Superintendent	2	6
● Trades as Subcontractor	1	2
▼ ● Company Operating Strategies	0	0
● Construction Demand	2	9
▼ ● Company Profile	1	6
● Company Culture	1	12
● Company scope of work	1	6
● Company Staffing- Salaried	1	2
▼ ● Industry Dynamics	0	0
● Construction Demand	2	9
● Front End Integration	1	1
● General Contractor	2	11
● Labor Market Salaried	1	1
● Risk	2	10
● Trades Labor Mkt Wages	1	1
▼ ● Internal Growth & Development	2	7
● Financial Commitment	1	1
● Internal Training	2	9
● Tuition Reimbursement	1	3
● Interviewee Attributes 	1	1
● Memo	1	7
▼ ● Recruitment	0	0
● College requirements	2	3
● Field Experience	1	3
● Millineals	1	1
● Recruitment - Field Supervi...	1	3
● Recruitment - Soft Skill Req...	2	18


▼ ● Skills - Soft		0	0
● Common Sense		0	0
● Communication		1	6
● Critical Thinking		0	0
● Integrity		0	0
● Leadership		0	0
● Quality of Work		0	0
● Work Ethic		2	9
▼ ● Technology		0	0
● Quality		1	1
● Technology - Future		2	5
● Technology Productivity		2	13
● Technology today		2	15
▼ ● Trades		0	0
● Trades Semi-skilled		1	3
● Trades Unskilled		1	1

Exhibit 8: Occupational Tax Workbooks

ACS 2012-2016															
SOC Occupation() Recode:301		Sample Records=383													
Off Sec & Admin Asst															
Age Grp 1					Age Grp 2					Age Grp 3					
(25-29)					(30-34)					(35-39)					
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	29,917	19567	2471	1497	3968	29129	18779	2353	1437	3790	31431	21081	2698	1613	4311
Bachelor's Degree	32,414				3026	32391	22041	2842	1686	4529	43297	32947	4478	2520	6999
Differential	2,497				-942	3262				739	11866				2688
Total					-1588225					1245468					4530570
Age Grp 4					Age Grp 5					Age Grp 6					
(40-44)					(45-49)					(50-54)					
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	33,459	23109	3003	1768	4770	38017	27667	3686	2117	5803	33763	23413	3048	1791	4839
Bachelor's Degree	36,808	26458	3505	2024	5529	38776	28426	3800	2175	5975	32733	22383	2894	1712	4606
Differential	3,349				759	759				172					-233
Total					1278685					289795					-393265
Age Grp 7					Age Grp 8					Totals					
(55-60)					(60-64)										
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Pop Incrmtl @ 30%				
HS Diploma	29,588	19238	2422	1472	3894	39450	29100	3901	2226	6127	< Bachelor	305	5619	1686	
Bachelor's Degree	46,718	36368	4991	2782	7774	43868	33518	4564	2564	7128	>= Bachelor	78	1446	1446	
Differential	17,130				3880	4418				1001					
Total					6540423					1686841	Total	383	7065	3132	
INDIVIDUAL															
NPV @3% \$8322 x 10 yrs.=	-\$83,220														
Earnings Differentials:	\$216,405.00														
POPULATION															
Govt. Cost: \$6813 x 4 yrs. =	\$ 85,345,088														
21.336 million each year- 4 years															
Incremental tax revenue stream/ age															
NPV for incremental Population Ed	\$ (51,049,935)														

ACS 2012-2016															
SOC Occupation(433031)															
Recode:268 Sample Records=143															
Bookkeeping, Acctg & Audit															
<u>Age Grp 1</u>						<u>Age Grp 2</u>					<u>Age Grp 3</u>				
<u>(25-29)</u>						<u>(30-34)</u>					<u>(35-39)</u>				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	28,584	18234	2271	1395	3666	32243	21893	2820	1675	4495	40303	29953	4029	2291	6321
Bachelor's Degree	40,304	29954	4029	2291	6321	31681	21331	2736	1632	4368	29777	19427	2450	1486	3936
Differential	11,720				2655	-562				-127	-10526				-2384
Total					1978989					-94897					-177376
<u>Age Grp 4</u>						<u>Age Grp 5</u>					<u>Age Grp 6</u>				
<u>(40-44)</u>						<u>(45-49)</u>					<u>(50-54)</u>				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	32,183	21833	2811	1670	4481	32142	21792	2805	1667	4472	40129	29779	4003	2278	6281
Bachelor's Degree	31,392	21042	2693	1610	4302	54919	44569	6914	3410	10323	57025	46675	7440	3571	11011
Differential	-791				-179	22777				5851					4729
Total					-133565					4361839					3525801
<u>Age Grp 7</u>						<u>Age Grp 8</u>					<u>Totals</u>				
<u>(55-60)</u>						<u>(60-64)</u>					Sample		Pop @ 30%		
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total					
HS Diploma	32,653	22303	2882	1706	4588	42472	32122	4355	2457	6812	< Bachelor	131	2485	746	
Bachelor's Degree	45,626	35276	4828	2699	7526	48160	37810	5208	2892	8100	>= Bachelor	12	222	222	
Differential	12,973				2938	5688				1288	Total	143	2707	968	
Total					2190566					960452					
INDIVIDUAL - All Costs incl Room & Board															
NPV @3% \$8,322 x 10 yr loan repayment (\$34,780)															
POPULATION - Tuition/Books only															
Govt. Cost: \$6813 x 4 yrs. = \$27,252 \$26,366,310															
6.592 million each year- 4 years															
Incremental tax revenue stream/ age															
NPV for incremental Population Ed (\$2,381,138)															

ACS 2012-2016															
SOC Occupation(472031)															
Recode:321															
Sample Records=940															
Carpenters															
Age Grp 1 (25-29)						Age Grp 2 (30-34)					Age Grp 3 (35-39)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	27,883	17533	2166	1341	3507	31681	21331	2736	1632	4368	30670	20320	2584	1554	4139
Bachelor's Degree	39,543	29193	3915	2233	6148	36617	26267	3476	2009	5486	45626	35276	4828	2699	7526
Differential	11,660				2641	4936				1118	14956				3388
Total					18563519					7858450					23810976
Age Grp 4 (40-44)						Age Grp 5 (45-49)					Age Grp 6 (50-54)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	35,782	25432	3351	1946	5297	36501	26151	3459	2001	5459	35420	25070	3297	1918	5215
Bachelor's Degree	40,430	30080	4048	2301	6349	42051	31701	4289	2425	6715	31145	20795	2656	1591	4246
Differential	4,648				1053	5550				1255					-968
Total					7399934					8821922					-6806093
Age Grp 7 (55-60)						Age Grp 8 (60-64)					Totals				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Pop Incrmtl @ 30%				
HS Diploma	38,569	28219	3769	2159	5928	38412	28062	3746	2147	5892	< Bachelor	880	23430	7029	
Bachelor's Degree	42,241	31891	4320	2440	6760	46349	35999	4936	2754	7690	>= Bachelor	60	1468	1468	
Differential	3,672				832	7937				1798					
Total					5846076					12636248	Total	940	24898	8497	
INDIVIDUAL All Costs Incl Room/Board															
NPV @3% \$8233 x 10 yrs. (\$33,744)															
POPULATION Tuition/Books only															
Govt. Cost: \$6813 x 4 yrs. = \$27252 \$ 231,560,244															
57.890 million each year- 4 years															
Incremental tax revenue stream/ age															
NPV for incremental Population Ed \$ 14,076,215															

ACS 2012-2016															
SOC Occupation(1110XX)															
Recode:2															
Sample Records=342															
CEO & Legislatures															
Age Grp 1 (25-29)						Age Grp 2 (30-34)					Age Grp 3 (35-39)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	37,318	26968	3581	2063	5645	50379	40029	5779	3062	8841	67168	56818	9976	4347	14322
Bachelor's Degree	28,247	17897	2221	1369	3590	60834	50484	8392	3862	12254	86899	76549	14909	5856	20764
Differential	-9,071				-2055	10455				3414	19731				6442
Total					-2427899					4033801					7612714
Age Grp 4 (40-44)						Age Grp 5 (45-49)					Age Grp 6 (50-54)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	50,379	40029	5779	3062	8841	51117	40767	5963	3119	9082	95206	84856	16985	6491	23477
Bachelor's Degree	102,604	92254	18868	7057	25925	116600	106250	22787	8128	30915	143128	132778	30215	9272	39487
Differential	52,225				17085	65483				21833					16010
Total					20188851					25800292					18919179
Age Grp 7 (55-60)						Age Grp 8 (60-64)					Totals				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Pop Incrmtl @ 30%				
HS Diploma	87,921	77571	15164	5934	21098	101392	91042	18532	6965	25496	< Bachelor	202	3939	1182	
Bachelor's Degree	157,065	146715	34117	9474	43591	112065	101715	21517	7781	29298	>= Bachelor	140	2386	2386	
Differential	69,144				22493	10673				3802	Total	342	6325	3568	
Total					26580139					4492451					
INDIVIDUAL- All Costs incl Room/Board															
NPV @3% \$8322 x 10 yrs. \$145,400.74															
POPULATION- Tuition/Books only															
Govt. Cost: \$6813 x 4 yrs. = \$27252 \$ 97,226,960															
24.307 million each year- 4 years															
Incremental tax revenue stream/ age															
NPV for incremental Population Ed \$135,652,855															

ACS 2012-2016															
SOC Occupation(472061)															
Recode:324															
Sample Records=1532															
Con Laborers															
Age Grp 1						Age Grp 2					Age Grp 3				
(25-29)						(30-34)					(35-39)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	29,898	19548	2468	1495	3964	30670	20320	2584	1554	4139	31235	20885	2669	1598	4267
Bachelor's Degree	31,145	20795	2656	1591	4246	30954	20604	2627	1576	4203	50689	40339	5856	3086	8942
Differential	1,247				282	284				64	19454				4675
Total					3615415					823399					59844827
Age Grp 4						Age Grp 5					Age Grp 6				
(40-44)						(45-49)					(50-54)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	31,145	20795	2656	1591	4246	38412	28062	3746	2147	5892	32445	22095	2851	1690	4541
Bachelor's Degree	36,961	26611	3528	2036	5564	32589	22239	2870	1701	4571	51624	41274	6090	3157	9247
Differential	5,816				1317	-5823				-1321					4706
Total					16862274					-16908170					60244359
Age Grp 7						Age Grp 8					Totals				
(55-60)						(60-64)									
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Sample Pop		Pop Incrmtl @ 30%		
HS Diploma	34,473	24123	3155	1845	5000	30414	20064	2546	1535	4081	< Bachelor	1439	42668	12800	
Bachelor's Degree	39,217	28867	3866	2208	6075	51745	41395	6068	3167	9234	>= Bachelor	93	2087	2087	
Differential	4,744				1075	21331				5153	Total	1532	44755	14887	
Total					13754235					65966497					
INDIVIDUAL- all costs incl room/board															
NPV @3% \$8322 x 10 yrs. (\$30,743)															
POPULATION- tuition/books															
Govt. Cost: \$6813 x 4 yrs. = \$27252 \$ 405,711,425															
101.428 million each year- 4 years															
Incremental tax revenue stream/ age															
NPV for incremental Population Ed \$ 63,250,985															

ACS 2012-2016															
SOC Occupation(119021)															
Recode:17															
Sample Records=1247															
Construction Manager															
Age Grp 1					Age Grp 2					Age Grp 3					
(25-29)					(30-34)					(35-39)					
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	34,668	24318	3184	1860	5044	56229	45879	7241	3510	10751	51278	40928	6003	3131	9134
Bachelor's Degree	60,834	50484	8392	3862	12254	65474	55124	9552	4217	13769	84560	74210	14324	5677	20001
Differential	26,166				7210	9245				3018	33282				10867
Total					105777174					44284002					159422406
Age Grp 4					Age Grp 5					Age Grp 6					
(40-44)					(45-49)					(50-54)					
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	61,563	51213	8575	3918	12492	63362	53012	9024	4055	13080	63922	53572	9164	4098	13263
Bachelor's Degree	69,521	59171	10564	4527	15091	83054	72704	13947	5562	19509	73710	63360	11611	4847	16458
Differential	7,958				2598	19692				6429					3196
Total					38119209					94325642					46884998
Age Grp 7					Age Grp 8					Totals					
(55-60)					(60-64)										
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Pop Incrmtl @ 30%				
HS Diploma	60,835	50485	8393	3862	12255	76115	65765	12213	5031	17244	< Bachelor	796	17023	5107	
Bachelor's Degree	103,817	93467	19208	7150	26358	70974	60624	10875	4638	15512	>= Bachelor	451	9564	9564	
Differential	42,982				14103	-5141				-1731	Total	1247	26587	14671	
Total					206905654					-25395863					
INDIVIDUAL all costs incl room/board															
NPV @3% \$8322 x 10 yrs. \$65,194.02															
POPULATION Tuition/Books only															
Govt. Cost: \$6813 x 4 yrs. = \$27252 \$ 399,811,367															
99.953 million each year- 4 years															
Incremental tax revenue stream/ age															
NPV for incremental Population Ed \$1,410,304,645															

ACS 2012-2016															
SOC Occupation(131051)															
Recode:35															
Sample Records=183															
Cost Estimators															
Age Grp 1						Age Grp 2					Age Grp 3				
(25-29)						(30-34)					(35-39)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	39,918	29568	3971	2262	6233	45626	35276	4828	2699	7526	46468	36118	4954	2763	7717
Bachelor's Degree	45,341	34991	4785	2677	7462	63464	53114	9050	4063	13113	84482	74132	14304	5671	19975
Differential	5,423				1228	17838				5587	38014				12258
Total					889173					4044217					8873835
Age Grp 4						Age Grp 5					Age Grp 6				
(40-44)						(45-49)					(50-54)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	47,099	36749	4959	2811	7770	53236	42886	6493	3281	9774	48586	38236	5330	2925	8255
Bachelor's Degree	95,043	84693	16945	6479	23424	126724	116374	25621	8903	34524	81113	70763	13462	5413	18875
Differential	47,944				15654	73488				24751					10620
Total					11331725					17916925					7687865
Age Grp 7						Age Grp 8					Totals				
(55-60)						(60-64)									
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Sample	Pop	Pop Incrmtl @ 30%		
HS Diploma	50,966	40616	5925	3107	9032	56229	45879	7241	3510	10751	< Bachelor	130	2413	724	
Bachelor's Degree	80,856	70506	13398	5394	18791	78474	68124	12750	5211	17961	>= Bachelor	53	1185	1185	
Differential	29,890				9759	22245				7210					
Total					7064602					5219676	Total	183	3598	1909	
INDIVIDUAL- all costs incl room/board															
NPV @3% \$8322 x 10 yrs. \$162,778															
POPULATION tuition/books only															
Govt. Cost: \$6813 x 4 yrs. = \$27252 \$ 52,021,343															
13.005 million each year- 4 years															
Incremental tax revenue stream/ age															
NPV for incremental Population Ed \$107,696,570															

ACS 2012-2016																	
SOC Occupation(47211)																	
Recode:328																	
Sample Records=771																	
Electricians																	
	Age Grp 1						Age Grp 2						Age Grp 3				
	(25-29)						(30-34)						(35-39)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total		Median	Taxable Income	Income Tax	Payroll Tax	Total		Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	29,239	18889	2370	1445	3815		32715	22365	2891	1711	4602		33793	23443	3053	1793	4846
Bachelor's Degree	93,360	83010	16524	6350	22874		30417	20067	2546	1535	4081		48617	38267	5338	2927	8265
Differential	64,121				19059		-2298				-520		14824				3419
Total					101685746						-2776956						18242841
	Age Grp 4						Age Grp 5						Age Grp 6				
	(40-44)						(45-49)						(50-54)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total		Median	Taxable Income	Income Tax	Payroll Tax	Total		Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	40,129	29779	4003	2278	6281		40557	30207	4067	2311	6378		41923	31573	4272	2415	6688
Bachelor's Degree	46,752	36402	4997	2785	7781		50739	40389	5869	3090	8958		39450	29100	3901	2226	6127
Differential	6,623				1500		10182				2580						-560
Total					8003384						13765472						-2988430
	Age Grp 7						Age Grp 8					Totals					
	(55-60)						(60-64)										
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total		Median	Taxable Income	Income Tax	Payroll Tax	Total		Sample	Pop	Pop Incrmtl @ 30%		
HS Diploma	42,822	32472	4407	2484	6891		46005	35655	4885	2728	7612		< Bachelor	732	17784	5335	
Bachelor's Degree	34,828	24478	3208	1873	5081		120910	110560	23994	8458	32451		>= Bachelor	60	1468	1468	
Differential	-7,994				-1811		74905				24839		Total	792	19252	6803	
Total					-9660132						132522540						
INDIVIDUAL- all costs incl room/board																	
NPV @3% \$8322 x 10 yrs. \$80,024.72																	
POPULATION- tuition/books only																	
Govt. Cost: \$6813 x 4 yrs. = \$27252 \$ 185,400,806																	
46.350 million each year- 4 years																	
Incremental tax revenue stream/ age																	
NPV for incremental Population Ed \$ 508,509,040																	

ACS 2012-2016															
SOC Occupation(499021)															
Recode:369															
Sample Records=587															
HVAC															
Age Grp 1 (25-29)						Age Grp 2 (30-34)					Age Grp 3 (35-39)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	30,323	19973	2532	1528	4060	41892	31542	4268	2413	6681	42179	31829	4311	2435	6746
Bachelor's Degree	47,344	36994	5085	2830	7915	43091	32741	4447	2505	6952	46005	35655	4885	2728	7612
Differential	17,021				3855	1199				272	3826				867
Total					15015839					1057752					3375277
Age Grp 4 (40-44)						Age Grp 5 (45-49)					Age Grp 6 (50-54)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	42,319	31969	4332	2446	6777	43101	32751	4449	2505	6954	51302	40952	6009	3133	9142
Bachelor's Degree	40,304	29954	4029	2291	6321	44566	34216	4669	2618	7286	30417	20067	2546	1535	4081
Differential	-2,015				-456	1465				332					-5061
Total					-1777623					1292415					-19710735
Age Grp 7 (55-60)						Age Grp 8 (60-64)					Totals				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Pop Incrmtl @ 30%				
HS Diploma	41,224	30874	4167	2362	6529	49422	39072	5539	2989	8528	< Bachelor	555	12983	3895	
Bachelor's Degree	36,501	26151	3459	2001	5459	44891	34541	4717	2642	7360	>= Bachelor	32	847	847	
Differential	-4,723				-1070	-4531				-1168	Total	587	13830	4742	
Total					-4166606					-4551080					
INDIVIDUAL all costs incl room/board															
NPV @3% \$8322 x 10 yrs. (\$65,144)															
POPULATION tuition/books only															
Govt. Cost: \$6813 x 4 yrs. = \$27252 \$ 129,226,259															
32.307 million each year- 4 years															
Incremental tax revenue stream/ age															
NPV for incremental Population Ed \$ (98,659,030)															

ACS 2012-2016															
SOC Occupation(471011)															
Recode:319															
Sample Records=1256															
First Line Supervision															
Age Grp 1 (25-29)						Age Grp 2 (30-34)					Age Grp 3 (35-39)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	40,606	30256	4075	2315	6389	45140	34790	4755	2661	7416	47439	37089	5100	2837	7937
Bachelor's Degree	49,372	39022	5527	2985	8512	58228	47878	7741	3663	11403	52801	42451	6384	3248	9632
Differential	8,766				2123	13088				3987	5362				1695
Total					14065853					26420994					11229051
Age Grp 4 (40-44)						Age Grp 5 (45-49)					Age Grp 6 (50-54)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	52,395	42045	6283	3216	9499	50030	39680	5691	3036	8727	56229	45879	7241	3510	10751
Bachelor's Degree	60,835	50485	8393	3862	12255	57433	47083	6599	3602	10201	61250	50900	8496	3894	12390
Differential	8,440				2756	7403				1474					1639
Total					18260105					9765852					10863032
Age Grp 7 (55-60)						Age Grp 8 (60-64)					Totals				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Pop Incrmtl @ 30%				
HS Diploma	52,395	42045	6283	3216	9499	52152	41802	6222	3198	9420	< Bachelor	1103	22088	6626	
Bachelor's Degree	42,241	31891	4320	2440	6760	54245	43895	6693	3358	10050	>= Bachelor	153	2956	2956	
Differential	-10,154				-2739	2093				631					
Total					-18152234					4180361	Total	1256	25044	9582	
INDIVIDUAL all costs incl room/board															
NPV @3% \$8322 x 10 yrs. (\$28,272)															
POPULATION tuition/books only															
Govt. Cost: \$6813 x 4 yrs. = \$27252 \$ 261,139,565															
65.285 million each year- 4 years															
Incremental tax revenue stream/ age															
NPV for incremental Population Ed \$7,716,934															

ACS 2012-2016															
SOC Occupation(111021) Recode:3 Sample Records=118															
Managers, Gen & Ops															
<u>Age Grp 1</u>					<u>Age Grp 2</u>					<u>Age Grp 3</u>					
(25-29)					(30-34)					(35-39)					
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	64,538	54188	9318	4145	13464	87772	77422	15127	5923	21050	58807	48457	7886	3707	11592
Bachelor's Degree	81,787	71437	13628	5465	19093	83964	73614	14175	5631	19806	81113	70763	13462	5413	18875
Differential	17,249				5630	-3808				-1243	22306				7283
Total					2382988					-526294					3082855
<u>Age Grp 4</u>					<u>Age Grp 5</u>					<u>Age Grp 6</u>					
(40-44)					(45-49)					(50-54)					
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	57,793	47443	7632	3629	11261	68946	58596	10420	4483	14903	105797	95447	19762	7302	27064
Bachelor's Degree	93,705	83355	16376	6377	22753	76825	66475	12390	5085	17475	394505	384155	110300	14575	124875
Differential	35,912				11491	7879				2572					97811
Total					4864317					1088936					41403581
<u>Age Grp 7</u>					<u>Age Grp 8</u>					<u>Totals</u>					
(55-60)					(60-64)										
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Pop Incrmtl @ 30%				
HS Diploma	62,290	51940	8756	3973	12730	122681	112331	24489	8593	33083	< Bachelor	76	1411	423	
Bachelor's Degree	105,078	94728	19561	7247	26807	90048	79698	15696	6097	21793	>= Bachelor	42	899	899	
Differential	42,788				14078	-32633				-11290	Total	118	2310	1322	
Total					5959057					-4779101					
INDIVIDUAL all costs incl room/board															
NPV @3% \$8322 x 10 yrs. \$233,770.53															
POPULATION tuition/books only															
Govt. Cost: \$6813 x 4 yrs. = \$27252 \$ 36,035,320															
9.009 million each year- 4 years															
Incremental tax revenue stream/ age															
NPV for incremental Population Ed \$82,395,209															

ACS 2012-2016															
SOC Occupation(119XX)															
Recode:28															
Sample Records=833															
Misc. Managers															
<u>Age Grp 1</u>						<u>Age Grp 2</u>					<u>Age Grp 3</u>				
<u>(25-29)</u>						<u>(30-34)</u>					<u>(35-39)</u>				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	33,376	23026	2990	1761	4752	44472	34122	4655	2610	7265	58617	48267	7838	3692	11530
Bachelor's Degree	54,914	44564	6912	3409	10321	60835	50485	8393	3862	12255	79202	68852	12984	5267	18251
Differential	21,538				5570	16363				4990	20585				6721
Total					21304321					19085677					25707835
<u>Age Grp 4</u>						<u>Age Grp 5</u>					<u>Age Grp 6</u>				
<u>(40-44)</u>						<u>(45-49)</u>					<u>(50-54)</u>				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	50,696	40346	5858	3086	8944	54751	44401	6872	3397	10268	60455	50105	8298	3833	12131
Bachelor's Degree	66,411	56061	9787	4289	14075	88244	77894	15245	5959	21204	84482	74132	14304	5671	19975
Differential	15,715				5131	33493				10935					7845
Total					19625874					41828152					30006419
<u>Age Grp 7</u>						<u>Age Grp 8</u>					<u>Totals</u>				
<u>(55-60)</u>						<u>(60-64)</u>									
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Pop Incrmtl @ 30%				
HS Diploma	67,481	57131	10054	4371	14425	67463	57113	10050	4369	14419	< Bachelor	585	12750	3825	
Bachelor's Degree	121,670	111320	24206	8516	32722	71449	61099	10994	4674	15668	>= Bachelor	248	4770	4770	
Differential	54,189				18298	3986				1249					
Total					69989118					4777153	Total	833	17520	8595	
INDIVIDUAL all costs incl room/board															
NPV @3% \$8322 x 10 yrs. \$94,033.38															
POPULATION tuition/books only															
Govt. Cost: \$6813 x 4 yrs. = \$27252 \$ 234,230,940															
58.558 million each year- 4 years															
Incremental tax revenue stream/ age															
NPV for <i>incremental</i> Population Ed \$ 341,891,114															

ACS 2012-2016															
SOC Occupation(472140)															
Recode:331															
Sample Records=456															
Paperhangers															
Age Grp 1					Age Grp 2					Age Grp 3					
(25-29)					(30-34)					(35-39)					
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	25,756	15406	1847	1179	3026	29648	19298	2431	1476	3907	35266	24916	3274	1906	5180
Bachelor's Degree					3026	26401	16051	1944	1228	3172	40304	29954	4029	2291	6321
Differential	-25,756				0	-3247				-735	5038				1141
Total					1065					-2691289					4175767
Age Grp 4					Age Grp 5					Age Grp 6					
(40-44)					(45-49)					(50-54)					
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	31,681	21331	2736	1632	4368	36336	25986	3434	1988	5422	35487	25137	3307	1923	5230
Bachelor's Degree	27,205	16855	2065	1289	3354	56425	46075	7290	3525	10815	39540	29190	3915	2233	6148
Differential	-4,476				-1014	20089				5393					918
Total					-3709951					19733895					3359346
Age Grp 7					Age Grp 8					Totals					
(55-60)					(60-64)										
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Pop Incrmtl @ 30%				
HS Diploma	31,795	21445	2753	1641	4394	44629	34279	4678	2622	7300	< Bachelor	436	12198	3659	
Bachelor's Degree	52,444	42094	6295	3220	9515	88764	78414	15375	5999	21373	>= Bachelor	24	586	586	
Differential	20,649				5121	44135				14073					
Total					18741246					51498654	Total	460	12784	4245	
INDIVIDUAL all costs incl room/board															
NPV @3% \$8322 x 10 yrs. (\$20,546.03)															
POPULATION tuition/books only															
Govt. Cost: \$6813 x 4 yrs. = \$27252 \$ 115,695,641															
28.924 million each year- 4 years															
Incremental tax revenue stream/ age															
NPV for incremental Population Ed \$42,873,020															

ACS 2012-2016															
SOC Occupation(472150)															
Recode:332															
Sample Records=573															
Pipefitter															
Age Grp 1 (25-29)						Age Grp 2 (30-34)					Age Grp 3 (35-39)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	32,445	22095	2851	1690	4541	34772	24422	3200	1868	5068	39262	28912	3873	2212	6085
Bachelor's Degree	41,182	30832	4161	2359	6520	50379	40029	5779	3062	8841	35487	25137	3307	1923	5230
Differential	8,737				1979	15607				3773	-3775				-855
Total					8105501					15453362					-3502148
Age Grp 4 (40-44)						Age Grp 5 (45-49)					Age Grp 6 (50-54)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	42,938	32588	4424	2493	6917	45368	35018	4789	2679	7468	45707	35357	4840	2705	7545
Bachelor's Degree	35,637	25287	3329	1934	5264	60835	50485	8393	3862	12255	49763	39413	5625	3015	8640
Differential	-7,301				-1654	15467				4787					1095
Total					-6773294					19606154					4484945
Age Grp 7 (55-60)						Age Grp 8 (60-64)					Totals				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Sample		Pop	Pop Incrmtl @ 30%	
HS Diploma	43,934	33584	4574	2569	7143	37827	27477	3658	2102	5760	< Bachelor	552	13653	4096	
Bachelor's Degree	42,241	31891	4320	2440	6760	42584	32234	4371	2466	6837	>= Bachelor	24	633	633	
Differential	-1,693				-383	4757				1077					
Total					-1570632					4413170	Total	576	14286	4729	
INDIVIDUAL all costs incl roomboard															
NPV @3% \$8322 x 10 yrs. (\$38,911.90)															
POPULATION tuition/books only															
Govt. Cost: \$6813 x 4 yrs. = \$27252 \$ 128,871,983															
32.218 million each year- 4 years															
Incremental tax revenue stream/ age															
NPV for incremental Population Ed \$ (4,193,366)															

ACS 2012-2016															
SOC Occupation(413099)															
Recode:254 Sample Records=191															
Sales Rep															
Age Grp 1 (25-29)						Age Grp 2 (30-34)					Age Grp 3 (35-39)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	36,839	26489	3510	2026	5536	31437	21087	2699	1613	4312	31145	20795	2656	1591	4246
Bachelor's Degree	88,582	78232	15329	5985	21314	88244	77894	15245	5959	21204	95217	84867	16988	6492	23480
Differential	51,743				15778	56807				16891	64072				19234
Total					11249707					12043415					13713848
Age Grp 4 (40-44)						Age Grp 5 (45-49)					Age Grp 6 (50-54)				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total
HS Diploma	48,668	38318	5351	2931	8282	36961	26611	3529	2036	5564	50696	40346	5858	3086	8944
Bachelor's Degree	84,092	73742	14207	5641	19848	105506	95156	19680	7279	26960	70542	60192	10819	4605	15424
Differential	35,424				11566	68545				21395					6480
Total					8246512					15254972					4620040
Age Grp 7 (55-60)						Age Grp 8 (60-64)					Totals				
Education Attainment (EDrecode)	Median	Taxable Income	Income Tax	Payroll Tax	Total	Median	Taxable Income	Income Tax	Payroll Tax	Total	Sample		Pop	Pop Incrmtl @ 30%	
HS Diploma	51,909	41559	6161	3179	9340	81113	70763	13462	5413	18875	< Bachelor	125	2377	713	
Bachelor's Degree	70,974	60624	10927	4638	15565	70531	60181	10764	4604	15368	>= Bachelor	66	1170	1170	
Differential	19,065				6225	-10582				-3508	Total	191	3547	1883	
Total					4438227					-2500864					
INDIVIDUAL all costs incl room/board															
NPV @3% \$8322 x 10 yrs. \$240,959															
POPULATION tuition/books only															
Govt. Cost: \$6813x 4 yrs. = \$27252 \$51,318,241															
12.830 million each year- 4 years															
Incremental tax revenue stream/ age															
NPV for incremental Population Ed \$150,586,673															

Exhibit 9: Bezos Quiz

Jeff Bezos:		
Princeton 1986		
Electrical Engineering/ Computer Science		

BIBLIOGRAPHY

Library of Congress:

<https://www.loc.gov/rr/program/bib/ourdocs/Morrill.html>

Association of Public and Land Grant Universities:

<http://www.aplu.org/library/the-land-grant-tradition/file>

Autor, David H., Frank Levy, and Richard Murnane, "The Skill Content of Recent Technological Change: An Empirical Exploration." National Bureau of Economic Research Working Paper No. 8337, 2001.

Becker, G. S. (1975) *Human Capital: a theoretical and empirical analysis with special reference to education*. New York, National Bureau of Economic Research: distributed by Columbia University Press, 1975.

Becker, G. S., & Chiswick, B. R. (1966). Education and the Distribution of Earnings, *American Economic Review*, 56(2), 358.

Bell, R. R., Hartgrove, L., Elkins, S. A., & Starnes, D. (2014). Workforce Development: Moving Down the Supply Chain with Strategies of Engagement. *SAM Advanced Management Journal* (07497075), 79(2), 4.

Bowles, Samuel, and Herbert Gintis, *Schooling in Capitalist America: educational reform and the contradictions of economic life*. N.p.: New York: Basic Books, c1976. Georgia State Univ's Catalog, ECSCOhost

Bowles, Samuel, and Herbert Gintis, 2002. "Schooling in Capitalist America Revisited." *Sociology of Education* 75, no. 1:1

Carnevale, Anthony P., and Stephen J. Rose and Ban Cheah, "The College Payoff: Education, Occupations, Lifetime Earnings", The Georgetown University Center on Education and the Workforce, Washington D.C. (2011).

Frey, Carl Benedict, and Michael Osborne. "The Future of Employment: How susceptible are Jobs to computerization?" *Technological Forecasting & Social Change*, 114 (January 1, 2017): 254-280.

Friedman, Milton & Rose (1980) *Free to Choose A Personal Statement*. New York, Harcourt, Brace, Jovanovich, 1980.

Mullin, Bethany P. 2011. "Human Capital as an Economic Development Tool in the Rural vs. Non-rural South." *Review of Management Innovation & Creativity* 4, no. 13: 1-19

Executive Office of the President; Council of Economic Advisers. (2009). Preparing the workers of today for the jobs of tomorrow. Washington, DC: Author. [L]
[SEP]

http://digitalcommons.ilr.cornell.edu/key_workplace/631

PEW Research Center, "The Rising Cost of Not Going to College." *Social and Demographic Trends*, February 11, 2014. (PEW Social Trends).

Schudde, Lauren, and Sara Goldrick-Rab. 2015. "On Second Chances and Stratification: How Sociologists Think About Community Colleges." *Community College Review* 43, no. 1:27.

Simon, Herbert A. 1955. A behavioral model of rational choice. *The Quarterly Journal of Economics*, 69 (February), 99-118.

Vilorio, Dennis. "Education Matters." Career Outlook, U.S. Bureau of Labor Statistics, March 2016. (Education Matters).

Zoellner, Don1. 2012. "Dualism and vocational education and training: Creating the people who require training." *International Journal of Training Research* 10, no. 2: 79-93.

VITA

Sheila Cappel has over 35 years of private sector industry experience concentrated in food and beverage manufacturing. Her career has demonstrated progressive responsibility across multiple disciplines associated with Executive Management, Supply Chain and Operations. She has led a top operational facility with proven results in safety, quality, cost and output, while maintaining exceptional employee relations. Her cross-functional experience includes Procurement, Human Resources, Plant Management and Logistics.

Her ongoing postgraduate academic pursuits has included the Executive Doctorate in Business at Georgia State University which embraces a curriculum that combines management innovation and leading-edge strategies through engaged scholarship. Additional post graduate academic achievements include a dual Master's degree from the University of Delaware in both Business and Economics, as well as a Master's in Liberal Studies from Rollins College.

Sheila is currently seeking opportunities to combine her depth and breadth of industry experience with academic competency to achieve results envisioned by the principles of engaged scholarship.