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MITIGATING STUDENT DEBT: A CASE FOR DIFFERENTIAL  
TUITION BY MAJOR

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## **ABSTRACT**

This paper presents a model to link the cost of a college degree with the income-earning potential of the related major. The rise in the level of student debt in recent decades is forcing many to reconsider the value of higher education. The causes of this sharp increase and potential remedies are explored. A benefits received approach through differential tuition is proposed as a solution to mitigate the issue of mounting student debt. I consider the implications and effects of implementing such a system, and how students and universities would be affected.

## TABLE OF CONTENTS

List of Figures .....	iii
Acknowledgements.....	iv
Chapter 1 Introduction .....	1
Chapter 2 The Rise of Student Debt .....	4
Causes .....	5
Chapter 3 Mitigating Student Debt .....	11
Current Remedies.....	12
Differential Tuition .....	17
Chapter 4 Proposal.....	20
Chapter 5 Model .....	24
Methodology and Data.....	24
Results.....	28
Chapter 6 Consequences of Implementation .....	30
Effect of Debt-to-Income Ratio .....	30
Enrollment Considerations.....	33
Majors Matter.....	35
Chapter 7 Conclusion.....	38
Appendix A Median Earnings per Major Starting Salary, Recent College Graduate .....	40
Appendix B Median Earnings per Major Salary, Experienced College Graduate .....	42
Appendix C	
Unemployment Rates, Recent College Graduates, Experienced College Graduates.....	44
Appendix D	
Data Results: Average Tuition Cost of Major, A to Z .....	46
Appendix E	
Data Results: Average Tuition Cost of Major, Lowest to Highest.....	48
BIBLIOGRAPHY .....	50

**LIST OF FIGURES**

Figure 1 Households with Outstanding Student Debt, 1989-2010 .....	4
Figure 2 Annual Percent Change in Public Four-Year Tuition and State Support (1990-91 to 2010-11; inflation adjusted).....	7
Figure 3 Public Four-Year and Private Nonprofit Four-Year Institutions Enrollment Figures.....	9
Figure 4 Federal Student Loan Interest Rate Schedule for 2013-2014.....	14
Figure 5 Number of Institutions with Differential Tuition by Year.....	17
Figure 6 Example of Model Calculation.....	27
Figure 7 Graph of Data Results: Average Yearly Tuition by Major.....	29
Figure 8 Percentage of Graduates Reporting Specific Life Events Delayed .....	31

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## Chapter 1

### Introduction

*“It is generally recognized in the halls of government and in rich and poor communities that access to higher education of high quality is an absolutely essential building block for the egalitarian ideals of Western democracies.” –*

David Ward and John A. Douglass, University of California, Berkeley –

May, 2005

Mary graduated from Tulane University in 1997 with a Bachelor’s of Science in the humanities. She consolidated her student loans under Sallie Mae, and has never missed a payment over the last fourteen years. After repaying more than \$61,000 over that period, she has more than covered the initial cost of her education. She contacted Sallie Mae and learned that she still owes \$25,000 due to an interest rate of 8%, which, as the employee puts it, they “certainly don’t go out of [their] way to put that in big bright red letters across the front page” (Yahoo Finance, 2012). Or take John, a Bachelor’s, Master’s, and PhD degree holder, who self-financed his education with Pell Grants, scholarships, and part-time jobs while attending school. His \$90,000 in subsidized and unsubsidized loans at the time seemed like a promising investment. As a public school teacher, a large portion of his take-home income needs to be siphoned towards repayment, yet he has made every monthly payment over the last ten years, totaling more

than \$40,000. Currently, his balance stands at \$105,000, almost 17% higher than his original loan.

The issue of student debt has never been more alarming with the staggering amount of loans that are now crippling this country's recent graduates. Considering the national student debt level has exceeded \$1 trillion, with an average of \$29,400 per graduate in 2012, there is a necessity to reevaluate both the cost of a college education and the benefits received by the students. The college degree has long been a staple of our credential society, offering the supposed value of employment. Yet, over time, it has developed as a signal of employee potential to the market, which does not seem to reward it commensurately.

For decades, the philosophy has been, "Attend college to get a good job." However, that is not always the case in today's increasingly competitive and globalized economy. Students are taking on a mountain of debt to secure a degree that often times will not pay for itself. Currently, there are about 37 million student loan borrowers. Of that total, 14%, or 5.4 million, have at least one past due student loan account (ASA, 2013). With the national unemployment rate above 7.0%, job security is now an ironic term. In 2011, over 50% of bachelor degree-holders under 25 years old were jobless or underemployed. As many recent graduates do not fully utilize their degrees, over 40% will become delinquent at some point in the first five years after entering repayment. While college degree-holders still earn more than their high school-only counterparts, the weight of student debt affects their life decisions, burdens their families, and negatively impacts the broader economy.

Despite the obvious disparity of income-earning potential across different majors, tuition costs are generally the same for all students at a university, albeit some petty marginal variations do exist. By and large, a student of accounting will pay the same for her education as a student of sociology, regardless of her long-term career outlook. Differential tuition has been proposed and debated for years, but only until recently have a larger proportion of colleges and universities begun to adopt such policies. While it would be impossible to completely eradicate student debt in the near future, a sensible alternative would be to at least make the debt manageable, and no longer a lifelong financial anvil. The best way to mitigate the student debt problem is for tuition to be directly correlated with the selected major's income-earning capacity.

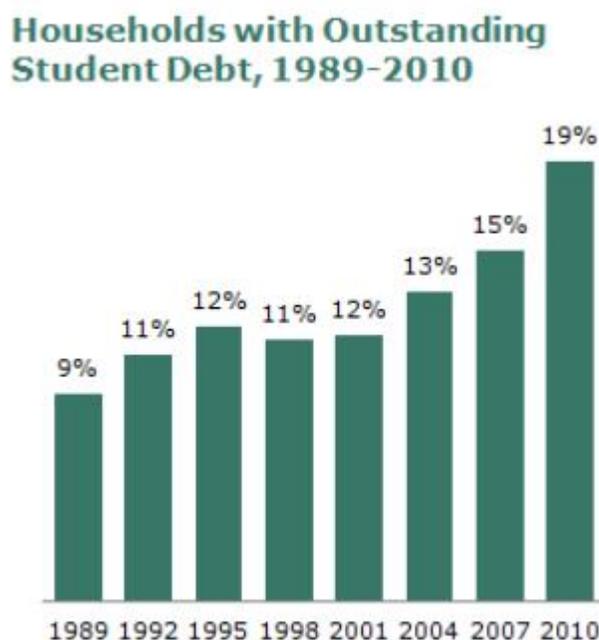
This paper provides a model to price academic majors by market prices of employment, using such factors as median income levels and unemployment rates, amongst others. This tool can be used so students can make more informed decisions about majors and fully realize income considerations. It can be said that the purposes of education are two-fold: to further equip an individual for employment, and for the overall betterment of society. This model advances these principles by creating a system so that student loans can be repaid, as the initial cost of education is calibrated by the expected returns on that investment.

## Chapter 2

### The Rise of Student Debt

The last decade has borne witness to an unprecedented rise in the level of student debt. Of the roughly 20 million Americans who attend college each year, almost 60% borrow money annually to cover the rising costs (ASA, 2013). From 2002 to 2012, the sheer volume of student loans grew by 77%, and consequently, there are currently over 37 million individuals with outstanding student loans (Brookings Institute, 2013). In the third quarter of 2013 the overall national student debt level surpassed \$1 trillion (Bloomberg, 2014). Upon graduation, the Class of 2012 was subjected to an average student loan debt of \$29,400 (Gallegos, 2013).

Student debt is now present in one out of every five households, and in nearly 40% of households headed by someone under 35 years old (Fry, 2012). This is more than double the amount in 1989. While every income level has been affected, it's those in the lowest fifth—the households earning less than \$21,044—that bear the brunt of the burgeoning loans. The average outstanding student debt as a share of household income is 6%, but for that lowest quintile, it is about 24%. Macroeconomic conditions clearly have had an impact on this, as wages are



**Figure 1 Households with Outstanding Student Debt, 1989-2010**

(Brookings Institute, 2013)

stagnant and income-inequality grows. Yet, total household debt over the same period has declined. Student debt is becoming one of the dominant factors affecting decision-making, burdening households, and stalling the broader economy.

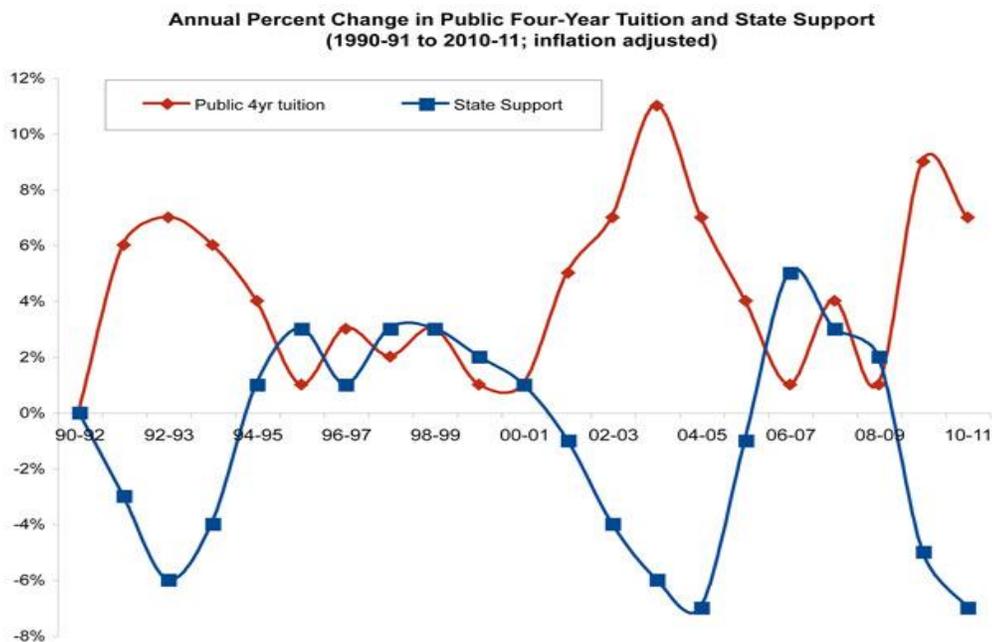
### **Causes**

As the level of student debt has been sharply rising over the last decade, plenty of research has been conducted to both explain the root causes of the issue and offer proposals that would help to mitigate it. In turn, through identification of the origins, actions are now being undertaken to moderate its explosive growth. Generally, the main elements behind the student debt explosion are threefold: rising tuition prices, increase in college attendance levels, and a damaged economy.

The deterioration of college affordability has resulted from substantial tuition spikes over the past few decades. Since 1978, the price paid for a college degree is up 1,120%, double the upsurge of Medical care and four times greater than the Consumer Price Index (Jamrisko, 2012). Uninhibited, rising institutional spending is a prevalent factor in mounting tuition costs. This phenomenon is best explained by Howard Bowen, known for Bowen's Revenue Theory of Costs, or simply, Bowen's Law (Bowen, 1980). This theory says, in essence, that universities will seek to gain as much revenue as possible, and spend whatever they can. This has been the case at both private and public universities. In order to improve the quality of the academic institutions, universities will spend more rather than reduce costs or reallocate funds in certain areas (Ehrenberg, 2000). However, oftentimes, this spending is in support of non-academic amenities,

rather than towards functions directly related towards instruction (Selingo, 2013). Spending on student services is up 19%, administrative positions 15%, and operations and maintenance over 20%. There is a “build it, they will come” approach by colleges and universities, as they have taken on more than \$300 billion in debt to finance construction, such as recreational facilities, student spas, and movie theaters. The universities’ “blank check” is only further fueled by the quasi-arms race of institutional spending in order to outpace competitors. The more lavish the facilities, fancier the dorms, and scenic the campus, the more students apply to the university. Quality is seen less through the lens of instruction, but rather, by which school offers the most favorable services.

Tuition costs, more recently, have also been raised in response to a reduction of state appropriations. As budgets tighten, discretionary spending in the form of support to state universities is often the first to be slashed. In 2012, the average state funding per student dropped 9% (WSJ, 2013), and 29 states allocated less discretionary spending to higher education than in 2007 (Selingo, 2013). Flagship public universities, such as the University of Virginia and the University of Michigan, now only have 6% and 7%, respectively, of their budgets supported by the state. In 2011, public universities received more revenue from tuition than funds from their state for the first time (NYT, 2011). Additionally, universities can use the decline of appropriations as a scapegoat for raising tuition even higher than needed. With over three-fourths of American students attending public higher education institutions, this shift to privatization has transferred the burden from public investment to the students.



**Figure 2 Annual Percent Change in Public Four-Year Tuition and State Support (1990-91 to 2010-11; inflation adjusted)**

A third contributory factor to rising costs involves the practice of tuition discounting (Davis, 2003). This form of price discrimination, more renowned for its use in the airline industry, has made bigger strides in public universities of late. Tuition discounting involves an intricate balance of what some students are able to pay, and what others are willing to pay. In an effort to attract more low-income students and minorities, universities will raise the “sticker price” for attending their institution. Tuition appears to be higher, but then they give a large portion back to the students in the form of financial aid. The intended success of this is two-fold: wealthier students subsidize those who would not be able to afford it otherwise, and the higher tuition prices signal quality to those entering the market of higher education. However, this may only work in theory. In the years following the Great Recession, first-year students at private universities were receiving, on average, 42% in discounts (Selingo, 2013). Yet, research indicates that middle-income students and their families are now receiving greater marginal percent increases in financial aid than lower-income students, causing the latter to borrow more

to support their cost of education. As institutions continue to increase their “sticker price,” they will gradually widen the rift between wealthy and poor students, forcing more student loans on those of lower socioeconomic standing.

Congressional measures may have abetted the rise of tuition prices in the form of federal financial aid. In 2007, Congress voted to raise the annual loan limit for incoming freshman, inadvertently signaling to colleges and universities that they can continue to raise tuition, because the guaranteed student loans will keep flowing (Watts, 2009). This idea, known as Bennett’s Hypothesis, was made prominent by former Secretary of Education William J. Bennett, who said, “If anything, increases in financial aid in recent years have enabled colleges and universities blithely to raise their tuitions, confident that Federal loan subsidies would help cushion the increase” (Gillen, 2012). Non-profit institutions, which is to say the majority of the well-known colleges and universities, tend to deny such a claim. Over the last 25 years however, evidence has arisen to both support and oppose the controversial suggestion.

With such an upsurge in the total volume of student loans, it is worthwhile to note the amount of people now enrolling in college as a contributing reason. The National Center for Education Statistics (NCES) calculated that the last decade of the 20th century saw an increase in enrollment of 11% at degree-granting institutions, compared to a 37% increase from 2000 to 2010. The number of students swelled from about 15 million to 21 million during that same time period. Any student who has had an economics class understands the simple functions of supply and demand. With such an increase in the amount of students demanding higher education, tuition could rise especially as credit, in the form of loans, was made more accessible.

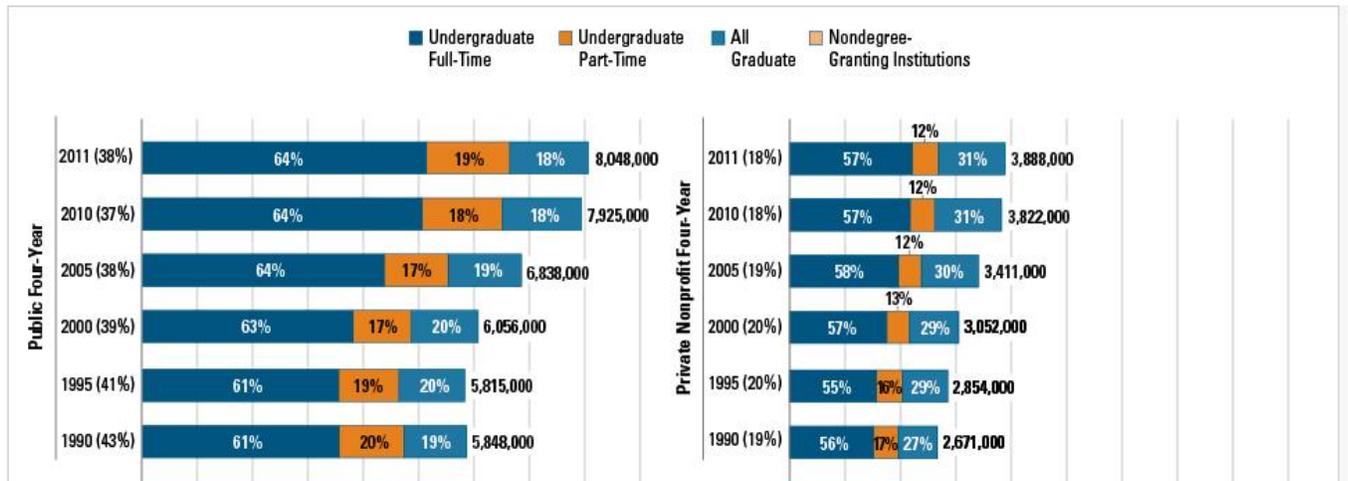


Figure 3 Public Four-Year and Private Nonprofit Four-Year Institutions Enrollment Figures

Source: (College Board, 2012)

*(Depicted here is public four-year and private nonprofit four-year institutions.*

*Public two-year and for-profit colleges account for the remainder of enrollment.)*

The NCES also projects an increase in enrollment of students under 25 years old by 11% from 2010 to 2020, and growth of 20% in enrollment by those over 25. As these numbers continue to multiply, the amount of student loans being taken on is expected to increase in proportion.

The state of the economy has negatively affected graduates income-earning capacity as well as induced individuals to reconsider their options and alternatives. While tuition was rising for decades, median family income levels increased at a fraction of that rate (Measuring Up, 2008), requiring more financial aid and loans to cover the costs.

With a weak job market during the Financial Crisis, more students turned to higher education in hopes of a more favorable future. From 2005 to 2010, over a million more

students decided to attend a public four-year institution. Instead of paying out-of-pocket, student loans were sought to fund degrees (Brookings Institute, 2013). Even as students finish college today, unemployment remains high, while interest on their loans begins accruing only six months after graduation. More debt is accumulating on the national level as bachelor-degree holders work as baristas.

## Chapter 3

### Mitigating Student Debt

Alleviating the issues fueling the skyrocketing of student debt gets progressively more complex as the number swells. Curbing the rise of tuition has neither a simple nor straightforward answer. If states would provide funding like they had previously, the burden would not fall on students and their families as much. Reducing spending on non-academic amenities like student services or the unnecessary amount of deans and administrators that are now running universities would add relief to budgets. A modern modification to the way higher education is governed, through shifting from central control to more autonomous parts could hasten what is currently a slow reaction to cost pressures (Ehrenberg, 2000). In the future, universities may need to grow by substitution rather than expansion, which is to say reallocate funds instead of raising more through tuition spikes. The federal government could provide more grants, instead of loans, to students that would not need to be paid back. Proposals on reigning in rising tuition, appropriating more state funds, interventions from Congress, new types of loan contracts, and instituting consumer protections continue to spark debate and grab headlines. Academics, politicians, and the public alike want to see this problem alleviated, as the effects of a generation in debt are already plaguing the economy.

### **Current Remedies**

In recent years, Washington has begun paying more attention to the blossoming bubble of student debt. In an attempt to alleviate some of the debt, the federal government has been enacting various reforms and measures through Congressional action. The College Cost Reduction and Access Act (CCRA) was signed into law in 2007, offering graduates several alternatives for repayment of federal loans (FinAid, 2008). If you can prove financial hardship, it is possible to qualify for an income-based repayment plan, by which you pay 15% of your disposable income for 25 years, after which all remaining debt is forgiven. For loanees that do not meet its strict requirements, one could try to meet the criteria for the income-contingent repayment plan. It is similar to the previous plan, except that payment is 20% of disposable income for 25 years. Lastly, the CCRA initiated a public service loan forgiveness plan. Borrowers that are employed full-time in a public service job, such as law enforcement, public health, or the military, for each of the 120 monthly payments (10 years), are then forgiven for their remaining principal and interest.

The Higher Education Opportunity Act was reauthorized in August of 2008, making amendments to the original reform act passed in 1965 (Duke-Benfield et al., 2008). Primarily, this revision affected disabled Americans, who could now discharge their loans if they met the same requirements set by the Social Security Administration. While impactful for some, many were hoping it would have a more expansive role. A year later, the House passed the Student Aid and Fiscal Responsibility Act of 2009, which then was worked into the Health Care and Education Reconciliation Act of 2010

(US News, 2010). A key reform laid out in this act is discontinuing the practice of the federal government providing subsidies to private banks to dole out federally ensured loans, and instead having the loans managed directly by the Department of Education (Washington Post, 2010). Moreover, Pell Grants were increased to a maximum of \$5,550 per year, however roughly 70% of those funds went to predatory for-profit colleges. Starting in 2014, borrowers eligible for the income-based repayment plan will now only owe 10% of their disposable income, instead of the previous 15% that was set, and the repayment period is reduced to 20 years. As the economy was offering recent graduates dismal prospects, the government was forced to lower their own standards for what they considered the worth of students' debt and degrees.

In July of 2013, interest rates on subsidized federal direct loans doubled from 3.4% to 6.8%. By August, after a month of contentious debate, Congress had passed and President Obama had signed the Bipartisan Student Loan Certainty Act (US News, 2013). This bill first corrected the interest rate spike by establishing a rate of 3.86% for undergraduates receiving either subsidized or unsubsidized Stafford Loans (US Joint Economic Committee, 2013). Going forward, it links the interest rates with the 10-year Treasury bill, plus a small margin. Even while setting a maximum limit on those rates, assuming interests rates rise in the future, undergraduate loans will not be capped until they hit 8.25%, and graduate students and PLUS loans are even higher. In principle, a market-based yet regulated solution using capped interest rates seemed viable, but really this is simply pushing off the underlying issue to a later date.

<b>Federal Student Loan Interest Rate Schedule for 2013-2014</b>					
	<b>2013-2014 Interest Rate Formulas</b>			<b>In Future Years, Rates Cannot Exceed:</b>	<b>Rates For Loans Issued in 2012-2013<sup>#</sup></b>
	<b>Margin</b>	<b>+ Index<sup>*</sup></b>	<b>= Rates For Loans Issued in 2013-2014<sup>^</sup></b>		
<b>Subsidized Stafford</b>	2.05%	+ 1.81%	= <b>3.86%</b>	8.25%	3.40%
<b>Unsubsidized Stafford for Undergraduates</b>	2.05%	+ 1.81%	= <b>3.86%</b>	8.25%	6.80%
<b>Unsubsidized Stafford for Graduate Students</b>	3.60%	+ 1.81%	= <b>5.41%</b>	9.50%	6.80%
<b>Graduate PLUS</b>	4.60%	+ 1.81%	= <b>6.41%</b>	10.50%	7.90%
<b>Parent PLUS</b>	4.60%	+ 1.81%	= <b>6.41%</b>	10.50%	7.90%

Figure 4 Federal Student Loan Interest Rate Schedule for 2013-2014

(CollegeUp, 2013)

As discretionary spending for higher education continues to be curtailed by state legislators, some have sought a more unique alternative: human-capital contracts. Like its name implies, an individual may receive a loan now and, under contract, be obligated to pay back the amount based on their future income earned over a mutually agreed upon period of time. By pledging themselves, a loanee is only worth however much their salary dictates, preventing them from worrying about repaying back a set amount each month or year. Oregon legislation recently passed HB3472, or the “Pay It Forward” plan (Oregon, 2013). Under this, students would attend public education institutes for free and graduates of four-year programs would pay back 3% of their income for 20 years. In this way, the state would increase their spending to cover the cost of education in return for future payment. However, opponents of this and other types of human-capital contracts point out that the nature of the loan is uncomfortably comparable to indentured servitude. They moreover suggest that this proposal may disincentivize students to achieve their

maximum income potential, and instead encourage them to seek out other benefits of work, such as non-wage inducements like a better work-life balance.

There is a growing opinion that, with default rates high and many graduates seen as having studied “worthless” majors, student loans should be evaluated using risk-based credit strategies (Simkovic, 2013). Cost of capital, risks, and rewards are all interrelated in capitalist markets, yet notably are not so in the area of student loan markets. Since different majors each have varying labor market values, job placements, and potential for income earned, the interest rates on their loans should act correspondingly. A benefit of this would be to drive interest in certain academic areas, such as the STEM fields – science, technology, engineering, and math. Universities would begin allotting their resources based on this shift to a few select majors, eventually slashing budgets in most other areas. Eventually, would all students opt for these less expensive majors that pay the most, causing an oversupply in the labor market? At the onset, these types of loans would allow some high-income potential students to escape college not buried in debt, but many in the fields of the humanities, social sciences, and the like, would be left with even more unmanageable debt. Key aspects of education are for the development of cultural literacy and good citizenship, which are the two components that could be lost in the pursuit of exclusively market solutions.

Criticisms have been made about lending practices to borrowers and the lack of consumer protections. Of all consumer loans, student loans are one of the only ones that are non-dischargeable in bankruptcy (Collinge, 2009). While federal loans have not been eligible for bankruptcy since 1978, private lenders were granted the same immunity in 2005 with the passing of the Bankruptcy Abuse Prevention and Consumer Protection Act.

Private loans often charge higher interest rates and have no income-based repayment plans, yet operate free of market forces as it is nearly impossible for a graduate to be exonerated of that debt. Lenders have the freedom to garnish incomes, such as from wages and social security, while interest and penalties continue to peg more to the total bill. If bankruptcy protection were to be reinstated, the threat of a student default would cause lenders to be more cautious about their loans, reducing the influx of money to colleges and universities, subsequently forcing them to limit tuition increases. However, the ability for students to have their debt absolved through bankruptcy is a recipe for abuse, thus creating the need for a fair market value-based solution.

Several of these proposals offer suggestions for positive outcomes, but none would truly mitigate the problem. Tuition increases need to be restrained by limiting out-of-control institutional spending and drifting away from the idea of a resort campus, while instead focusing on the core of its existence: higher education. Colleges should again become a major recipient of public investment. The federal government needs to take more steps in reducing the burden on students, by keeping interest rates low and offering some forms of consumer protection, while preventing the rise of indentured servitude contracts. These remedies would all be advantageous to students and graduates, yet to mitigate the problem on a national level would require entwining education to the economy. The model in this paper goes further than any of these proposed solutions, as it addresses the subject not regularly considered: calibrating the cost of education by the expected income earned from it. Instead of solely focusing on managing costs, this model introduces market outcomes in a non-discriminating way to evaluate and manage the costs of a major.

### Differential Tuition

The concept of differential tuition as an alternative pricing model for higher education has been proposed and debated for decades, but until only recently has it been adopted by colleges and universities on a larger scale. With comparisons often made highlighting the similarities of universities to profit-seeking firms, the lack of differential tuition has been recognized by researchers Rothschild and White in 1993 as one of the “puzzles” in the higher education system.

Differential tuition, as used in this paper, refers to a calculated and purposeful variation of tuition cost, depending on a student’s academic major. While this method of pricing historically has been implemented in comparing in-state residents versus out-of-state residents as well as graduate education versus undergraduate education, the late 1990s and 2000s have seen a massive upsurge in differing program-to-program tuition costs at public universities (CHERI, 2011). The Cornell Higher Education Research

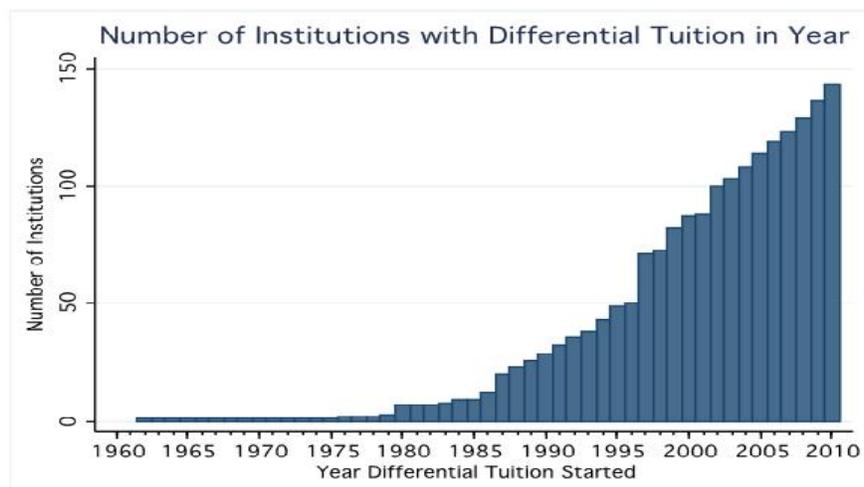


Figure 5 Number of Institutions with Differential Tuition by Year

Institute identified 143 public universities with some form of differential tuition, and that number is expected to continue to grow.

Several factors have been recognized as contributing to this shift in pricing model. First, the varying costs associated with educating students in different majors must be considered, with some using a much greater amount of resources. For example a physics or finance major benefiting from laboratory or trading room services and/or highly paid faculty consume more resources than sociology or philosophy majors. Next, the income-earned by graduates in certain fields is likely to outmatch others. This implies lost opportunities foregone by the university by not charging a higher tuition fee for academic areas that are in high demand. Lastly, programs that directly relate their costs and revenues experience greater self-sufficiency and ability to effectively manage the department (Ward & Douglass, 2005).

Proponents for such a system have, for years, called attention to the current inefficient resource allocation that takes place in higher education. Being such complex organizations, with diversified values and procedures among differing departments, universities have traditionally been centrally focused and managed (Massy, 1996). This has served an important role in carrying out a university's goals and objectives, while staying true to their intrinsic values. At the same time, however, it essentially breaks one of the most fundamental concepts in business: linking revenues with costs.

The basics of a capitalist economy are that prices are determined by the interaction of consumers (demand) and producers (supply). These curves are affected for a myriad of reasons – preferences, growth, competitors, etc. Most importantly, market prices are assumed to work efficiently if and when there is full information by buyers on

the purchased product or service. Student demand for majors and more importantly, the supply of majors have been distorted because these are not calibrated by the market value of a given major. While economists strive to identify the equilibrium price, where price is reflective of clearing quantity demanded and quantity supplied, tuition cost/prices fails in this regard. Conceptually, differential tuition by major would provide a viable solution.

## Chapter 4

### Proposal

In large organizations, cost is a result of allocation procedures. In higher education institutions, the proportion of indirect costs is large relative to the direct costs of educating the student, and tuition costs are generally fixed with respect to the student. As most of the costs attributed to students are assigned through an arbitrary centralized process, there is an absence of cost pressure on a per unit (student) basis (Massy, 1996). This inefficient practice fails to utilize an individual department's attention to market forces. Even without the presence of a student, their cost would still exist.

Cost allocation decisions involve four main criteria: cause and effect, benefits received, fairness or equity, and ability to bear (Horngren et al., 2011). While, traditionally, colleges and universities have opted for a system of fairness or equity on the presumption that all majors are worth the same, the cause and effect and benefits received models have been emphasized for their superiority, as they best adhere to the purpose of cost allocation to "provide information for economic decisions." These two cost allocation processes, while not simple, could be applied in universities. Flat pricing is inherently erroneous, and differential tuition is more equitable for the students as well (Yanikoski & Wilson, 1984). Uniform prices force students who are using up less of the institutions resources to quintessentially subsidize other students' more costly academic endeavors. When it costs more to educate a business student than education major, does it not make more sense to use a differing price model?

Inefficient resource allocation is widespread. One example of a flaw in flat pricing is the Pennsylvania State University average salaries of professors, associates, and assistants by college. In 2011-2012 professors in the college of business earned on average \$192,274 per year, as opposed to \$104,057 by those in the college of education (PSU, 2012). One might assume with some professors being paid nearly twice as much as others that the higher faculty costs would translate to proportionately higher tuition costs for business students, yet the variations are quite slim. For instance, the marginal cost of adding a few more finance majors to the program could be very high if more faculty members are required. Contrast that with adding more students to an elementary education program, where the faculty cost is typically much lower. In allowing for this cross-subsidization, universities are failing to properly attribute and account for the real cost of educating students.

Another aspect of inefficient cost distribution lies in the level of the courses. A recent study by the State Higher Education Executive Officers (SHEEO, 2010) that analyzed data from four large education systems – Florida, New York-SUNY, Illinois, and Ohio – discovered that upper-level instruction (third and fourth years of education) costs roughly 40% more than lower-level instruction (first and second years of education). This can be attributed to the increased quality of instructors, use of more expensive university property, and smaller classes sizes.

In addressing these cost considerations, colleges and universities can more adequately cover their costs by aligning them with the tuition they earn, which in turn reflect the expected income from the majors they offer. Each department will be responsible for their own budgets, applying cost pressures and promoting the need for

allocation efficiency. They will be forced to maintain or enhance their quality to ensure the continuation of their presence. In a sense, this reverts back to Adam Smith's discussion of the Oxford model in the 1700s, where each professor charged what they deemed the value of their time. If more students were interested (an increase in demand), the price was reflective. This approach corrects the inherent flaws of flat pricing.

While the root causes of some costs could be traced to their origins and properly allocated at colleges and universities, a more reasonable and pragmatic approach would be calibrating costs to the benefits received. A primary objective of education is future success in the job market, thus the benefits received from employment should guide the allocation process. Tuition cost should be based on a student's selected major and its associated income levels and unemployment rates. Education is neither fair nor equal, so why is it priced as if it was?

Differential tuition based on the benefits received method charges students in accordance with the marginal benefits received from their investment. From the consumer, or student side, this is a more sensible scenario. Bearing in mind the human capital theory of economics, "Students will respond rationally in a way that will maximize their return, comparing the cost of their education to the future monetary benefits they will accrue (Nelson, 2008)." This efficiency-based principle of pricing will allow students to assign benefits to each major, and optimize their investment (Paulsen & Smart, 2001). This approach is advantageous as it provides a balance to students' interests, opportunity cost, and relationship of investment and return.

The growing adoption of differential tuition at colleges and universities across the country shows that there is a gradual realization of the inefficacy of the present cross-

subsidization type of system. But this needs to go further. Equalizing students' return on investment is a justifiable response to the imbalanced situation. When a student selects a major, there ought to be no economic deterrent. This approach removes discrimination from academic choice. The world needs the liberal arts as much as mathematics. Through this model, the cost and value of major will be calibrated by benefits received by the degree, in this case expected salary and probability of finding a job in that field. The payback period becomes more standardized and controllable, on the assumption that the benefits of education last for the same number of years, regardless of major. This also reduces the likelihood of a life saddled by unaffordable debt. Consonant with the presuppositions of capitalistic economies, price is disciplined by market forces.

## Chapter 5

### Model

#### Methodology and Data

This model computes the estimated value of a four-year degree based on the income-earning potential of that major. The worth of each degree is determined by calculating 20% of her discretionary income over the next 20 years, while accounting for the likelihood of finding employment (i.e. unemployment rate). Data on 43 majors were analyzed. The raw information, provided by the Georgetown University Center on Education and the Workforce, derived from the Bureau of Labor Statistics, the National Center for Education Statistics, and the American Community Survey, is used for the following variables:

*Median Earnings per Major Starting Salary, Recent College Graduate, Constant Years*

*1-5: SS*

*Unemployment Rate, Youth, Recent College Graduate, Constant Years 1-5: URY*

*Median Earnings per Major Salary, Experienced College Graduate EGS*

*Unemployment Rate, Experienced College Graduate, Constant Years 6-20: URE*

The starting salaries represent Bachelor degree holders aged 22-26 years old. For the purposes of this model given data limitations, that number is assumed constant for all

five years, and is weighted by the unemployment rate during that period. The median income for experienced college graduates corresponds to 30-54 year olds. In this model, I use that median income amount to denote the earnings of a graduate aged 42 years old, which is both the midpoint of the ages and also 20 years after completion of their degree. Using the Rate formula, I calculate the average annual income increase. Since the starting salary is assumed the same over the first five years because it is uncertain when a recent graduate will secure a job during that period, the growth of income is based on the 15-year period from age 27 to 42 years old.

The next component is used to calculate a graduate's discretionary income (DI), which is defined as the adjusted gross income minus the federal poverty line (FinAid, 2008). The federal government uses 20% of DI (also a government metric) as a ceiling in its own income contingent repayment plan, and this model follows that same guideline. The 2012 Weighted Average Poverty Thresholds is provided by the U.S. Bureau of Census. To determine the average increase for the next 20 years, I use the average rate of the previous 20 years of 2.36% and apply it to future raises. The variable is as follows:

$$\text{Poverty Line, Year 1: } PL_1$$

$$\text{Poverty Line, Years 2-20: } PL_1 \times (1.0236\%^{Y-1}) = PL_Y$$

It is necessary to discount the amount of discretionary income back to present value, to account for the time value of money. To do so, this model uses the 20-Year Treasury Yield Curve rate, provided by the U.S. Department of Treasury, as the risk-free rate.

$$\text{Risk-Free rate (as of December 16}^{th}\text{, 2013): } 3.63\% = rf$$

Key Assumptions

- Room and Board is the same for all students
- Total cost of education is financed by borrowed money
- % of annual income and years to pay back the student loan are the same
- These calculations can be subject to sensitivity analysis

**Step 1** of the model, to calculate the Rate for annual percent growth of median income from Years 6-20:

$$\text{Rate} = (15 \text{ years}, 0 \text{ payments}, -PV \text{ of SS}, FV \text{ of EGS})$$

**Step 2**, to calculate  $EGS_Y$  for Years 6-20, using computed Rate ( $r$ ):

$$[SS \times (1+r)^{Y-5}] = EGS_Y$$

**Step 3**, to find discretionary income for Years 1-5:

$$[SS \times (1 - URY)] - [PL_Y] = DI_Y$$

**Step 4**, discretionary income for Years 6-20:

$$[EGS_Y \times (1 - URE)] - [PL_Y] = DI_Y$$

**Step 5**, to find the PV of  $DI_Y$ :

$$[DI_Y / (1 + rf)^Y] = PV_Y$$

**Step 6**, take 20% of the discretionary income per year, after discounting, to find annual payment:

$$PV_Y \times 20\% = PMT_Y$$

**Step 7**, sum payments to determine true value of a four-year degree, and divide by four to find average yearly cost of attendance.

$$[\text{Sum}(\text{PMT}_{1-20})] / 4 = \text{Net worth of degree based off income-earning potential}$$

of major

	A	B	C	D	E	F	G	H	I
1	ACCOUNTING								
2	Year	Salary	Salary After Unemployment Rates	Poverty Line	Discretionary Income	Present Value of DI	20%, PV of DI = PMT		
3	1	\$ 43,000	\$ 39,216	\$ 11,700	\$ 27,516	\$ 26,552	\$ 5,310		
4	2	43,000	39,216	11,976	27,240	25,365	5,073		
5	3	43,000	39,216	12,259	26,957	24,223	4,845		4-Year Degree Worth:
6	4	43,000	39,216	12,548	26,668	23,123	4,625		\$91,837.21
7	5	43,000	39,216	12,844	26,372	22,065	4,413		
8	6	44,246	41,989	13,147	28,842	23,287	4,657		Average Yearly Tuition Cost:
9	7	45,528	43,206	13,458	29,748	23,177	4,635		\$22,959.30
10	8	46,847	44,458	13,775	30,683	23,068	4,614		
11	9	48,205	45,746	14,100	31,646	22,959	4,592		
12	10	49,601	47,072	14,433	32,639	22,849	4,570		
13	11	51,038	48,435	14,774	33,662	22,740	4,548		
14	12	52,517	49,839	15,122	34,717	22,631	4,526		
15	13	54,039	51,283	15,479	35,804	22,523	4,505		
16	14	55,605	52,769	15,845	36,924	22,414	4,483		
17	15	57,216	54,298	16,218	38,079	22,305	4,461		
18	16	58,874	55,871	16,601	39,270	22,197	4,439		
19	17	60,580	57,490	16,993	40,497	22,089	4,418		
20	18	62,335	59,156	17,394	41,762	21,981	4,396		
21	19	64,141	60,870	17,805	43,065	21,873	4,375		
22	20	66,000	62,634	18,225	44,409	21,765	4,353		

Figure 6 Example of Model Calculation

## Results

The results of the model revealed the economic worth of each major using metrics such as starting salary, median earnings, unemployment rate, and a percentage of discretionary income. All students are assumed to fund their education entirely by debt and have the same period of repayment. While some would opt for paying off their education bill earlier, each would be in the same economic situation regardless of major selected so that variations in initial wealth endowments do not affect the results. The percentage of their annual income earmarked for repayment are also standardized, but calibrated with the benefits received.

The extent to which incomes vary by degree has been studied over the years, but mostly in relation to calculating the net present value or lifetime return, and less so as an emphasis on what students *should* be paying. When tuitions are so calibrated, the disparities are blatantly apparent. The difference between the highest valued four-year degree, \$138,840 in electrical engineering, and the one of lowest worth, \$41,444 for drama and theater arts, is a staggering \$97,696 or 236% of the latter. Yet, for the most part, they will pay the same for their degree. For example, freshmen at Penn State's University Park campus studying in the College of Arts and Architecture and the College of Engineering pay identical tuition. For upper level classes, theater majors face a cost of about \$18,300, while engineers pay only around a thousand dollars more for the year. Electrical engineers can and should be compensated at higher levels of income, as their specialty is in need and their expertise requires a greater amount of resources. As a result,

their successes in the market allow for painless and near effortless repayment of loans, chiefly due to the latter major's subsidization of costs when measured by benefits received .

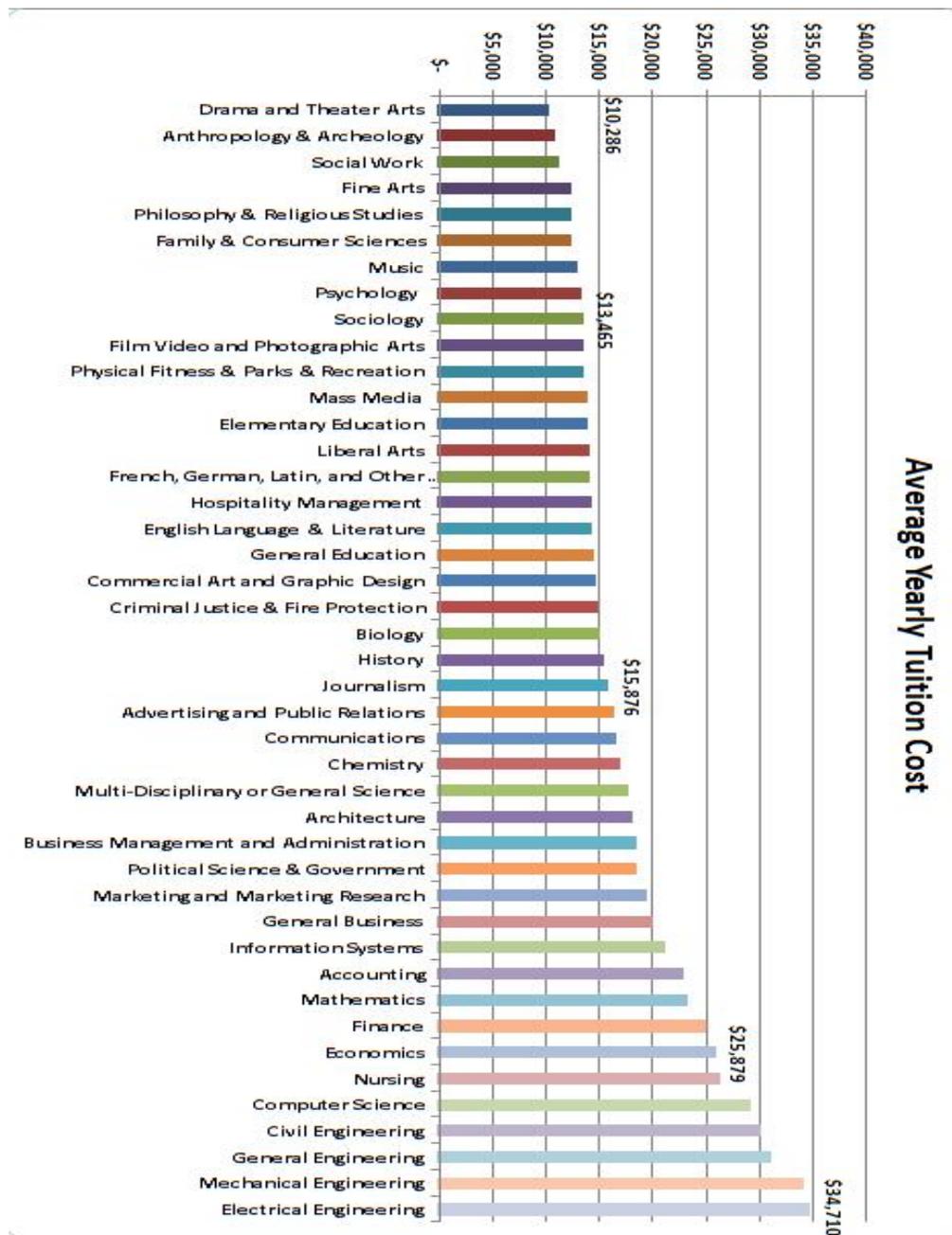


Figure 7 Graph of Data Results: Average Yearly Tuition by Major

## **Chapter 6**

### **Consequences of Implementation**

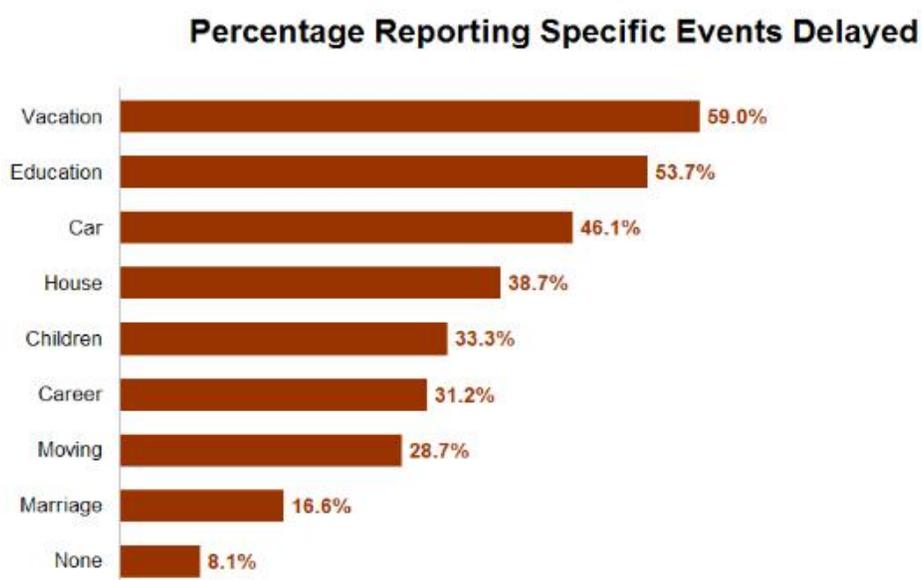
Colleges and universities have been sluggish to adopt such a policy as differential tuition by major primarily for the inherent uncertainty of success. The effects of a change in cost and revenue structure are difficult to predict, and most institutions would prefer to implement new procedures that already have a proven record. Critics of differential tuition regularly argue that undergraduates should not be factoring in cost to their choice, but instead allow themselves to be guided by their interests and passions. Some claim that higher tuition for more lucrative majors will disproportionately impact low-income, minority, and female students, thus pricing out a segment of the population. Questions of enrollment also arise, as fears that some majors, notably those considered more “important” like the STEM fields, would see a decline if they are priced higher. None of these criticisms apply to the model proposed here, which leaves the choice of major to the student nor will not discriminate against poorer students.

#### **Effect of Debt-to-Income Ratio**

The debt-to-income (DTI) ratio is a valuable metric that encapsulates the impact of borrowing to fund a higher education degree. Successful repayment of student loans is contingent upon several factors, yet the most direct is income. DTI affects the type of job a recent graduate will accept, the satisfaction of their degree and employment, and many

important life choices. A high DTI influences more than just personal finance, it alters mentality and decision-making. Differential tuition on the basis of major directly correlates a graduate's debt and income level, facilitating repayment of the owed obligation.

In 2011, the Iowa Student Loan Student Indebtedness Task Force conducted research on nearly 2,500 graduates to assess the effects of a high and low DTI (Iowa, 2011). Their findings indicated that the median for the ratio was 18% DTI, and thus used that as the determinant for students self-identifying as high or low. Not surprisingly, there was a high correlation between DTI and difficulty in loan repayment. As a borrower's DTI increased, they felt more burdened by the loans, and were more likely to reduce non-essential expenses in their life. The establishment of both savings accounts and retirement accounts is much more unlikely when one faces a high DTI. In affecting the broader economy, higher DTI denotes a delay in life events, such as vacations, purchasing a car or house, further education or advanced degrees, and marriage.



**Figure 8 Percentage of Graduates Reporting Specific Life Events Delayed**

Of the six characteristics studied in the research project, the only one that was not affected by a high DTI was satisfaction of major choice. The other five – satisfaction with current job, current income level, standard of living, future career opportunities, and family life – were all looked upon with growing disdain and frustration. Graduates in this category are much more likely to say that the benefits of a college degree are offset by the financial burden of loan repayments and level of comfort. A college education and lucrative employment opportunities have long gone hand-in-hand, but for an increasingly larger segment of the population this has become a myth of the American Dream.

The model in this paper links income-earning potential with the value of a degree. As indicated by the research, when students face a high debt-to-income level, there are several negative consequences. Nearly all aspects of a graduate's post-university life are shaped by a burden of debt that outweighs their income level. It is noted that their satisfaction with choice of major is the only thing impervious to DTI sensitivity, as passion is considered more important than financial success. If students' selection of major would yield them a relatively equivalent DTI, these harmful corollaries could be avoided. Recent graduates would not necessarily have to settle for the first job that comes along, and could instead wait for the right opportunity in a field that is more worthwhile. They would be more interested in their careers and the futures that they may hold. Additional disposable income would present itself in a more agreeable standard of living and devotion to family. The macroeconomic results of a manageable debt cannot be understated. Psychological and financial well-being are two indicators of success and happiness, driven by satisfaction of lifestyle and career. Differential tuition would provide repose from the ill effects of a high DTI. In aligning tuition with the value of the

degree, students will not gamble their future with unpayable debt. Their choice of major would not be an economic deterrent, but instead a worthwhile investment.

### **Enrollment Considerations**

Studies have indicated that higher net-tuition price has a negative effect on college enrollment (Stange, 2012; Heller, 1997). Yet, higher education is still viewed as having an inelastic demand. Even as tuition prices have been going up for decades, college enrollment is at an all-time high. The wage premium between college degree-holders and those who maxed out their education at high school continues to widen. Overall, education is still seen as a good choice. While there is evidence that students' choice of school is influenced by price, other factors are relevant, such as location, prestige, and size. Conversely, review of the literature has repeatedly called to attention the lack of empirical research as to the effects of differential tuition on students' selections of academic majors (Stange, 2012; Nelson, 2008, Ward & Douglass, 2005; Yanikowski & Wilson, 1984).

A primary consideration in implementing this form of differential tuition by major is being able to retain students and not decrease enrollment. The "tuition elasticity" of students' responses could have a tremendous impact on this model's success. A 2008 study by researchers Shin and Milton looked at six academic disciplines – Engineering, Physics, Mathematics, Biology, Business, and Education – to determine the elasticity in response to price increases. From 2002 to 2004, they studied colleges and universities to determine the outcomes of increases in tuition on student enrollment by academic area.

Their findings concluded that Engineering, which has the highest rate of return for a student's investment, is neither affected by initial tuition price nor the subsequent raising of tuition. Students, when deciding on college enrollment, will act rationally to maximize their return on investment; that is to say they compare their future monetary benefits to the current cost of their education (Shin & Milton, 2006). While demand theory would dictate that increased tuition cost would correspond with a decrease in enrollment, there are other factors to consider. As long as students deem their cost of investment in education to be relative to benefits received, demand will not be affected by changes in tuition.

In considering the enrollment of low-income or minority students, the simplest way to prevent negative outcomes would be to maintain the levels of student aid in proportion. Currently, students receive aid either from federal programs or through the school, usually from their endowment. In this pricing model, a student studying a lower-cost major would receive the same proportionate amount as they, in general, receive today. Likewise, a higher-value major would require a higher allocation of funds to support a low-income or minority student. Therefore, there should be no significant difference in the overall amount allotted to these qualified students. Since the model dictates that value of degree is relative to income-earning capacity, if a low-income student funds their education entirely by debt, they should have limited problem in repaying their loans in relation to other students. This paper is not large enough in scope to address the growing problem of misappropriations of financial aid. Nonetheless, critics that voice concerns could be temporarily satisfied with this proposal.

### **Majors Matter**

Most critics of differential tuition call attention to the need for graduates with STEM degrees. In 2012 Florida Governor Rick Scott commissioned the Florida Blue Ribbon Task Force on State Higher Education Reform to create a proposal allowing public universities to charge different tuition by major, in an attempt to lower the costs for degrees in STEM fields – science, technology, engineering, and math (NYT, 2012). The plan called for freezing tuition for three years in academic areas of strategic importance, the “high skill, high wage, high demand” majors that the economy needs. As state financing for higher education continues to decline, he argues that universities must be more pragmatic with the types of degrees they are granting. In a speech that year, Scott said, “Do you want to use your tax dollars to educate more people who can’t get jobs in anthropology? I don’t” (The Atlantic, 2012).

A major flaw in this approach is the emphasis on finding a job after graduation if you are in a STEM field. In contrast to public perception, the notion that liberal arts majors are both “unemployed” and “unemployable” is a “growing myth” (The Chronicle of Higher Education, 2013). A 2013 report by the Georgetown Center for Education found that unemployment rates for recent graduates in varying majors contradict public perception. For instance, a 22-26 year old drama and theatre arts graduate faces an unemployment rate of only 6.4%, compared to 8.1% for mechanical engineering. Journalism majors entering the job market struggle with a 7.0% unemployment rate, while those who studied computer science are confronted with an 8.7% rate. Perhaps tech

companies only cry for more investment in STEM majors as an excuse so they can continue to move jobs offshore.

While, in general, STEM fields drive growth and innovation, an assumption with this proposal is that the government can decide which majors are most important for society. Since the job market does not always adhere to expectations, how would they decide what majors are most marketable each year? A reduction in tuition for some majors would effectively cause others to rise, most likely leading to suffering in the liberal arts or humanities areas. This problem with incentivizing students to choose a major based on price is under the theory that talented students are currently choosing other, easier majors, and would easily switch and excel in a STEM field. The plan in Florida is undeniably unfair to majors that already face higher debt levels, all while making it easier for those who will likely earn much more over their careers.

Majors often deemed “unimportant” by politicians, economists, and, more recently, much of society, are in fact just the opposite. Social work and counseling, two areas dominated by social sciences graduates, are underpaid yet in a necessary field. Students studying the humanities and sciences are increasingly being seen as vital assets to companies, especially in the areas of innovation. A study by The Association of American Colleges and Universities discovered that 80% of employers say every college student should have broad knowledge in liberal arts (AACU, 2013). Likewise, the skills you develop through those studies, such as critical thinking, creativity, and analysis, are some of the only abilities that will not (in the foreseeable future) be replaced by computers. Steve Jobs, the co-founder and former CEO of Apple, notably once said, “It’s

technology married with liberal arts, married with the humanities, that yields the results that make our hearts sing.”

Studies suggest that students may select low-income earning majors, such as in the social sciences or humanities, because of the “option values” inherent in that selection (Shin & Milton, 2008). Oftentimes, those students will opt for continuing their education through graduate school or extended research periods. In this regard, the benefits derived from their education are not necessarily of monetary value, yet still provide probability of sought rewards. A major with high “option values” assigned by students has a considerable positive effect on academic selection (Eide & Waehrer, 1998). These areas, moreover, are seen as the gateways to more advanced disciplines, such as medicine and law (Forbes, 2012). The Association of Medical Colleges (AAMC) announced that over 50% of humanities majors were accepted to medical schools, one of the highest rates by discipline. Likewise, according to a study by a law professor at Chicago State University, in the top ten majors accepted by law school were philosophy, anthropology, history, and English. In order to prevent these academic areas from disappearing, they must be kept at an accessible and affordable attainment price.

## **Chapter 7**

### **Conclusion**

Higher education faces a daunting journey in the years ahead. A slow economic recovery, a disappearing middle class, and technological advancements all indicate a growing problem. Recent entrants, such as Massive Online Open Courses, which are offered for free, may soon threaten the monopoly that higher education institutions have on the market for human capital. In order for universities to maintain their apex position, revolutionary thinking must prevail. Changes need to come from all layers of the societal institution, from governmental intervention into the current state of student loans and the lack of consumer protections, to the universities contributory actions, and from the students ultimately electing to take on debt to finance their education. Past and current remedies have all come up short.

Differential tuition is trailblazing the way for future pricing methods at colleges and universities. The number of institutions that have implemented some form of this pricing system has doubled in the last decade. However, the degree of price differences needs to be expanded upon. Currently, most of these slim marginal variations do not truly account for the unequal value of each major. Differential tuition on a grander scale using benefits received would, for the first time, tie market forces to cost of investment. Without this, student debt will continue to inflate to irreparable levels.

The model that I have formulated offers a unique solution for resolving this dilemma, and one that would have a lasting effect. Students would have the opportunity to select the major that suits them best, without the decades of debt encumbrance. While some majors would carry a higher price tag, each would have the same economic value

during the payback period of the student's loan. Upon graduation, the varying income levels of the young professionals would already be accounted for, thus balancing the burden, and potentially eliminating most students' debt by mid-career, as opposed to the life-long obligation many face today. In pursuing a major that they want to do, rather than just one that will make enough money to pay off their loans, each individual is more likely to excel and be content with their work. This plan is one step towards curing the societal affliction that is taxing this country's graduates, as these loans are draining the worth of a college diploma.

### Appendix A

#### Median Earnings per Major Starting Salary, Recent College Graduate

<u>Major</u>	<u>Starting Salary</u>
Accounting	\$43,000
Advertising and Public Relations	\$33,000
Anthropology & Archeology	\$27,000
Architecture	\$36,000
Biology	\$30,000
Business Management and Administration	\$36,000
Chemistry	\$31,000
Civil Engineering	\$51,000
Commercial Art and Graphic Design	\$33,000
Communications	\$33,000
Computer Science	\$50,000
Criminal Justice & Fire Protection	\$30,000
Drama and Theater Arts	\$25,000
Economics	\$46,000
Electrical Engineering	\$57,000
Elementary Education	\$33,000
English Language & Literature	\$31,000
Family & Consumer Sciences	\$30,000
Film Video and Photographic Arts	\$30,000
Finance	\$44,000
Fine Arts	\$29,000
French, German, Latin, and Other Common Foreign Languages	\$30,000
General Business	\$38,000
General Education	\$34,000

General Engineering	\$55,000
History	\$32,000
Hospitality Management	\$30,000
Information Systems	\$40,000
Journalism	\$32,000
Liberal Arts	\$31,000
Marketing and Marketing Research	\$36,000
Mass Media	\$31,000
Mathematics	\$41,000
Mechanical Engineering	\$57,000
Multi-Disciplinary or General Science	\$35,000
Music	\$30,000
Nursing	\$48,000
Philosophy & Religious Studies	\$29,000
Physical Fitness & Parks & Recreation	\$29,000
Political Science & Government	\$35,000
Psychology	\$30,000
Social Work	\$29,000
Sociology	\$30,000

## Appendix B

### Median Earnings per Major Salary, Experienced College Graduate

<u>Major</u>	<u>Experienced Graduate Salary</u>
Accounting	\$66,000
Advertising and Public Relations	\$57,000
Anthropology & Archeology	\$45,000
Architecture	\$65,000
Biology	\$57,000
Business Management and Administration	\$60,000
Chemistry	\$65,000
Civil Engineering	\$81,000
Commercial Art and Graphic Design	\$50,000
Communications	\$58,000
Computer Science	\$81,000
Criminal Justice & Fire Protection	\$56,000
Drama and Theater Arts	\$46,000
Economics	\$75,000
Electrical Engineering	\$91,000
Elementary Education	\$41,000
English Language & Literature	\$52,000
Family & Consumer Sciences	\$43,000
Film Video and Photographic Arts	\$51,000
Finance	\$72,000
Fine Arts	\$48,000
French, German, Latin, and Other Common	\$52,000

Foreign Languages	
General Business	\$62,000
General Education	\$43,000
General Engineering	\$77,000
History	\$55,000
Hospitality Management	\$52,000
Information Systems	\$66,000
Journalism	\$56,000
Liberal Arts	\$51,000
Marketing and Marketing Research	\$65,000
Mass Media	\$51,000
Mathematics	\$71,000
Mechanical Engineering	\$86,000
Multi-Disciplinary or General Science	\$56,000
Music	\$46,000
Nursing	\$65,000
Philosophy & Religious Studies	\$48,000
Physical Fitness & Parks & Recreation	\$50,000
Political Science & Government	\$65,000
Psychology	\$50,000
Social Work	\$41,000
Sociology	\$50,000

**Appendix C**  
**Unemployment Rates, Recent College Graduates, Experienced College Graduates**

<u>Major</u>	<u>Unemployment Rate, Recent College Graduate</u>	<u>Unemployment Rate, Experienced College Graduate</u>
Accounting	8.8%	5.1%
Advertising and Public Relations	7.3%	5.8%
Anthropology & Archeology	12.6%	6.7%
Architecture	12.8%	9.3%
Biology	7.8%	5.1%
Business Management and Administration	7.8%	5.6%
Chemistry	5.8%	5.6%
Civil Engineering	7.6%	4.0%
Commercial Art and Graphic Design	10.5%	6.7%
Communications	8.2%	6.0%
Computer Science	8.7%	4.7%
Criminal Justice & Fire Protection	8.9%	4.6%
Drama and Theater Arts	6.4%	7.6%
Economics	10.4%	5.3%
Electrical Engineering	7.6%	4.6%
Elementary Education	5.0%	3.7%
English Language & Literature	9.8%	6.3%
Family & Consumer Sciences	6.4%	5.6%
Film Video and Photographic Arts	11.4%	6.5%

Finance	5.9%	4.4%
Fine Arts	10.1%	7.3%
French, German, Latin, and Other Common Foreign Languages	8.1%	5.0%
General Business	7.6%	4.7%
General Education	7.6%	4.2%
General Engineering	7.0%	4.8%
History	9.5%	5.8%
Hospitality Management	6.0%	5.4%
Information Systems	14.7%	4.4%
Journalism	7.0%	5.4%
Liberal Arts	8.1%	6.7%
Marketing and Marketing Research	6.6%	5.8%
Mass Media	8.9%	7.9%
Mathematics	5.9%	4.6%
Mechanical Engineering	8.1%	3.4%
Multi-Disciplinary or General Science	6.6%	3.9%
Music	8.6%	5.1%
Nursing	4.8%	2.3%
Philosophy & Religious Studies	9.5%	7.3%
Physical Fitness & Parks & Recreation	5.2%	4.5%
Political Science & Government	11.1%	5.8%
Psychology	9.2%	6.6%
Social Work	8.2%	6.5%
Sociology	9.9%	6.1%

**Appendix D**  
**Data Results: Average Tuition Cost of Major, A to Z**

<u>Major</u>	<u>Average Yearly Tuition Cost</u>	<u>4-Year Degree Worth:</u>
Accounting	\$22,959	\$91,838
Advertising and Public Relations	\$16,443	\$65,771
Anthropology & Archeology	\$10,847	\$43,390
Architecture	\$18,108	\$72,430
Biology	\$15,078	\$60,311
Business Management and Administration	\$18,453	\$73,812
Chemistry	\$17,028	\$68,113
Civil Engineering	\$30,101	\$120,404
Commercial Art and Graphic Design	\$14,716	\$58,864
Communications	\$16,517	\$66,069
Computer Science	\$29,281	\$117,123
Criminal Justice & Fire Protection	\$14,922	\$59,687
Drama and Theater Arts	\$10,286	\$41,144
Economics	\$25,879	\$103,517
Electrical Engineering	\$34,710	\$138,840
Elementary Education	\$13,888	\$55,551
English Language & Literature	\$14,280	\$57,118
Family & Consumer Sciences	\$12,458	\$49,833
Film Video and Photographic Arts	\$13,474	\$53,894

Finance	\$25,054	\$100,215
Fine Arts	\$12,391	\$49,563
French, German, Latin, and Other Common Foreign Languages	\$14,164	\$56,656
General Business	\$20,015	\$80,059
General Education	\$14,481	\$57,926
General Engineering	\$31,044	\$124,177
History	\$15,431	\$61,723
Hospitality Management	\$14,230	\$56,919
Information Systems	\$21,173	\$84,690
Journalism	\$15,876	\$63,503
Liberal Arts	\$14,137	\$56,546
Marketing and Marketing Research	\$19,424	\$77,697
Mass Media	\$13,852	\$55,408
Mathematics	\$23,343	\$93,372
Mechanical Engineering	\$34,085	\$136,339
Multi-Disciplinary or General Science	\$17,678	\$70,713
Music	\$12,979	\$51,916
Nursing	\$26,277	\$105,107
Philosophy & Religious Studies	\$12,430	\$49,720
Physical Fitness & Parks & Recreation	\$13,587	\$54,349
Political Science & Government	\$18,577	\$74,308
Psychology	\$13,419	\$53,677
Social Work	\$11,330	\$45,322
Sociology	\$13,465	\$53,860

**Appendix E**  
**Data Results: Average Tuition Cost of Major, Lowest to Highest**

<u>Major</u>	<u>Average Yearly Tuition Cost</u>	<u>4-Year Degree Worth:</u>
Drama and Theater Arts	\$10,286	\$41,144
Anthropology & Archeology	\$10,847	\$43,390
Social Work	\$11,330	\$45,322
Fine Arts	\$12,391	\$49,563
Philosophy & Religious Studies	\$12,430	\$49,720
Family & Consumer Sciences	\$12,458	\$49,833
Music	\$12,979	\$51,916
Psychology	\$13,419	\$53,677
Sociology	\$13,465	\$53,860
Film Video and Photographic Arts	\$13,474	\$53,894
Physical Fitness & Parks & Recreation	\$13,587	\$54,349
Mass Media	\$13,852	\$55,408
Elementary Education	\$13,888	\$55,551
Liberal Arts	\$14,137	\$56,546
French, German, Latin, and Other Common Foreign Languages	\$14,164	\$56,656
Hospitality Management	\$14,230	\$56,919
English Language & Literature	\$14,280	\$57,118
General Education	\$14,481	\$57,926
Commercial Art and Graphic Design	\$14,716	\$58,864
Criminal Justice & Fire Protection	\$14,922	\$59,687

Biology	\$15,078	\$60,311
History	\$15,431	\$61,723
Journalism	\$15,876	\$63,503
Advertising and Public Relations	\$16,443	\$65,771
Communications	\$16,517	\$66,069
Chemistry	\$17,028	\$68,113
Multi-Disciplinary or General Science	\$17,678	\$70,713
Architecture	\$18,108	\$72,430
Business Management and Administration	\$18,453	\$73,812
Political Science & Government	\$18,577	\$74,308
Marketing and Marketing Research	\$19,424	\$77,697
General Business	\$20,015	\$80,059
Information Systems	\$21,173	\$84,690
Accounting	\$22,959	\$91,838
Mathematics	\$23,343	\$93,372
Finance	\$25,054	\$100,215
Economics	\$25,879	\$103,517
Nursing	\$26,277	\$105,107
Computer Science	\$29,281	\$117,123
Civil Engineering	\$30,101	\$120,404
General Engineering	\$31,044	\$124,177
Mechanical Engineering	\$34,085	\$136,339
Electrical Engineering	\$34,710	\$138,840

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# ACADEMIC VITA

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### PERMANENT ADDRESS:

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### EDUCATION

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#### The Pennsylvania State University, Smeal College of Business

##### Schreyer Honors College

B.S. in Accounting, M.S. in Accounting

University Park, PA

*Class of May 2014*

##### IES: Business & International Affairs

Certificate in Intercultural Management

Paris, France

*Spring 2013*

### RELATED WORK EXPERIENCE

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#### GE Capital – Norwalk, CT

*June 2013 – August 2013*

##### Controllershship Development Program: Regulatory Reporting Intern

- Completed income statement preparation and analysis for Y-9LP filing to the Federal Reserve
- Reviewed financials of several legal entities as part of Y-11 & Y-2314 filings, in support of the Q2 close with the Regulatory Reporting Team
- Simplified process and built framework for future utilization
- Improved analytical and technical skills, notably with Microsoft Excel

#### Clipboard Plus, LP – State College, PA

*June 2011 – Present*

##### Co-Founder

- Designed two new products to be used by consumers as a peripheral accessory for smartphones and tablets to boost productivity in the workplace
- Successfully raised over \$11,000 in initial 30-day funding period
- Fully involved in areas of product management, strategic development, and internal logistics

#### Westrum Development Company – Fort Washington, PA

*May 2012 – August 2012*

##### Accounts Coordinator

- Responsible for coordination of accounts payable accounts for vendors and internal transactions, including reconciliations and the General Ledger system
- Organized and analyzed comparative financial spreadsheets for the quarterly financial summaries and reported to the CFO
- Completed budget variance analysis to ensure all payments have sufficient funding, and report any discrepancies to the appropriate manager
- Assisted other departments (staff accounting, reimbursement and internal audit) as needed
- Communicated effectively with managers, supervisors, peers, corporate and field staff

### LEADERSHIP

---

#### Delta Sigma Pi, Professional Business Fraternity

*January 2010 - Present*

##### Vice President of Pledge Education

- Planned, oversaw, and evaluated the Fall 2012 pledging program
- Coordinated the development of selected candidates in values of professionalism, community service, and philanthropy to facilitate initiation into the fraternity
- Managed a committee of five members each with delegated responsibilities to execute a successful pledging program

##### Vice President of Scholarships and Awards

- Responsible for Delta Sigma Pi's applications to eligible national, regional, or university awards, as well as promoting the growth of the chapter's overall academic success
- Collaborated with fellow executive board members to plan and execute all major fraternity operations

##### Vice President of Chapter Operations

- Acted as communications liaison between the brotherhood and the national representatives of the fraternity
- Maintained attendance records and the official roster for a brotherhood of over 80 active members

#### Sociology Teaching Assistant

*August 2012 – December 2012*

- Provided reinforcement of lectures to students through study hours and exam reviews
- Assisted the professor in the routine functions of class, including set-up, prep work, and grading assignments

### SKILLS/INTERESTS

---

Proficient skills in Microsoft Excel, Word, and PowerPoint

Interests include reading, technology, innovation, history, culture, and world traveling