# Student Loan Debt: The Value of Different College Majors

by
Kaleb Cardwell

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Thesis Committee:

Sean Salter, Thesis Director

Stuart Fowler, Second Reader

Ennio Piano, Thesis Committee Chair

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Kaleb Cardwell

APPROVED:

_____

Sean Salter, Thesis Director
Associate Professor, Economics and Finance, Jones College of Business

_____

Stuart Fowler, Second Reader
Interim Chair, Economics and Finance, Jones College of Business

_____

Ennio Piano, Thesis Committee Chair
Assistant Professor, Economics and Finance, Jones College of Business

Abstract

This study uses a financial model to determine the estimated economic value of different college majors when accounting for student loan debt. Furthermore, this study also looks particularly at MTSU's majors. The model uses different capital budgeting methods such as net present value, internal rate of return, payback period, and retirement savings to find the actual value of a given major. Like previous studies, this one found that STEM, business, and nursing degrees had the biggest payoffs, whereas liberal arts, education, and social work had the smallest payoffs. Given these results, there is enough evidence to confirm the hypothesis that the best majors would conform with previous findings.

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# 1. Introduction

The current student loan crisis is one of the American economy's largest burdens. Although student loans have given access to higher education to a wide variety of people, they have become a roadblock to accumulating wealth. Higher education has proven to set up graduates for better careers, higher incomes, and more opportunities; however, the opportunity cost of going into debt for some degrees is questionable at best.

This study focuses on discovering or confirming the general public's beliefs on what majors result in the best financial payoff for the average U.S. college student and the average student at Middle Tennessee State. This is accomplished by creating a financial model within Microsoft Excel that can be manipulated with various inputs and variables. While all variables could be significant, this study focuses on student loan debt, stock market returns, and savings rates. These variables are the ones that have the most significant effect on results and are given the most consideration. Lastly, this study attempts to identify the college majors with the best financial value through tables and comparisons. This study only discusses and accounts for the financial values that a major can bring an individual. There are undoubtedly some positive, unquantifiable aspects to some majors that may have a lackluster financial payoff. These aspects should be considered in the real world when picking a major. Still, this study only focuses on the financial value of different majors and helping prospective students make informed decisions.

The hypothesis of this study is majors that are within the category of STEM or business will have the best financial payoff. In contrast, majors within liberal arts and education categories will have a lower financial payoff. This hypothesis is expected to be true for the average college and MTSU student. Given that many prior studies have found similar results, these results are expected. While this study is unique in that student debt is the reference point rather than the overall cost of college, there is no reason to believe that the results would vary from previous research.

This study's methodology and results will greatly interest a wide variety of people. Although this model intends to be used as an informative guide or starting point of research for potential college students, the findings will be helpful to parents, educators, and the general population. The student loan crisis is in dire need of answers and finding any solutions at the national or individual level is a step in the right direction. Ultimately, this project aims to help prospective students make more informed decisions on where they go to college, how they pay for college, and what they learn.

## 2. Literature Review

As of September 2021, student loan debt exceeded 1.7 trillion dollars and is currently outpacing the American economy six times over. Although this number is large, the debt continues to grow nearly 24% yearly, affecting over 40 million Americans (Hanson, 2022). Even with conservative estimates, these numbers indicate that America will exceed over 2 trillion U.S. dollars within the next year and over 3 trillion U.S. dollars by the end of the decade (Johnson, 2019, p. 2). With this many people being affected, it is easy to see the significant interest that American households have in the student loan debt crisis.

The most apparent reason student loan debt continues to be an issue is the rising price of higher education. From 1990 until 2015, the cost of college rose by over 150% (Fullwiler et al., 2018, p. 11). This is an extraordinary number, as inflation over this period was only 65.8% (*Historical inflation rates*, 2022). This price difference can be attributed to various reasons, such as overbuilding campus amenities, overpaid administration, and increased demand; however, the most prominent reason is a decrease in government funding. From 2008 and 2018, state funding for education was cut by 6.6 billion U.S. dollars (Mitchell et al., 2019, p.1). Given that higher education is still required for many careers and the consumer has been forced to cover the difference in funding, unwanted student loan debt has become a primary funding source for Americans seeking a college degree.

While there is a prominent issue in the cost of higher education, there have been plenty of potential solutions to solve the problem. The most debated solution prevalent in this study that economists and politicians discuss is eliminating student loan debt.

Removing 1.7 trillion dollars of student debt might seem detrimental to the economy; however, inflation would increase marginally at just .3%, and real GDP would increase by over 20 billion U.S. dollars per year (Fullwiler et al., 2018, p. 6). While this sounds good in theory, eliminating all student loan debt could be considered unfair to borrowers who opted to avoid college to take a lower-paying career and the borrowers who have already paid off their student loans. It would also not solve the student loan crisis moving forward. Higher education is only getting more expensive and popular, so eliminating student debt could be immediate progress; it would more than likely put America back in the same situation.

The government has taken recent action by giving student debt borrowers some relief. Pell Grant recipients recently received a $20,000 reduction to their student loans, whereas all other student debt borrowers received a $10,000 deduction. This action has helped more than 40 million Americans reduce their student loan amount and has set a precedent that the American government is finally acting on the issue (*Fact Sheet*, 2022). This aid from the government is highly beneficial to borrowers and shows that the government is working on the issue. However, it does not solve the fundamental problem of student loan debt. The real issue is that college costs are still rising, and student loans are still being used to cover nearly 25% of the total cost (Hanson, 2022). Furthermore, if all eligible students take advantage of their respective debt relief, student loan debt will return to the same level within six years (*How long before*, 2022). While student debt borrowers appreciate the federal government's actions, it is a short-term solution to a much larger problem.

Given that the United States government has still yet to solve the student loan issue itself, students should not rely on government help in the future. Instead, they should focus on making informed decisions regarding what they major in and where they go to school. Obtaining higher education is still valuable and more than likely always will be. However, choosing a quality major for a reasonable price will continue to become more critical as education costs continue to rise. The responsibility for these decisions continues to impact students' future financial well-being significantly.

This is where my research and financial model add value in helping solve the issue. In the current circumstances, the responsibility is focused on the individual rather than the government. Relying on the government to bail out bad financial decisions moving forward is unwise and could be the worst financial mistake of a prospective student's life. Thus, picking the right major or college should be the student's priority.

In 2020, the Bureau of Labor and Statistics found that an average bachelor's degree pays over 500 more dollars a week (*Measuring the value*, 2021). Another study by the Social Security Administration found that college graduates earn over $900,000 more than high school graduates (*Education and lifetime earnings*, 2015). These studies show that obtaining further education beyond high school pays well. Because of this, the decision to attend or forgo college is easily one of the most significant financial decisions anyone makes in their lifetime. On the surface, studies like this should make the decision easy; however, the time commitment, financial investment, and forgone earnings make the decision much more challenging than one may believe. Also, all majors are not created equally and should be considered rather than looking at averages for all majors.

Given that these other factors are important, many studies have examined the value of a college degree while accounting for them. One study, "Is College Worth it? A Comprehensive Return on Investment Analysis," found that the median return on investment for a college degree is $306,000; however, over 25% of the majors have a negative return on investment. The major groups that made up most of the negative return on investments were visual arts, music, philosophy, and religious studies (Cooper, 2021). Another study conducted by Education Data Initiative found that consumer science, home economics, fine arts, general studies, liberal arts, and education also all had a negative return on investment. This study also found that computer science, information systems, finance, accounting, and electrical engineering all have returns of over 500% (Hanson, 2021). These statistics show that all majors are not equal, and some majors should maybe be avoided altogether. The caveat to these findings is that the world needs social workers, artists, and teachers; however, it does not make sense if a college student is either paying for the degree themselves out of pocket or going to college to reap the financial reward of obtaining a degree.

## 3. Methodology

My goal for this project is to create a tool that people can use before entering college to make better decisions regarding what majors to pick and what colleges to attend, and how those decisions correlate with their future financial well-being. To accomplish this, the created financial model had different inputs and variables, making it easy for the average person to use. Furthermore, I wanted to create an almost identical model that looks specifically at Middle Tennessee State University and compare

differences in projected outcomes that a prospective student could expect, given their choice of major. Although the model is relatively easy to use, read, and interpret, creating it was an extremely complex process that involved many different parts and assumptions. While all the individual components were built separately, they all work seamlessly together to give efficient and useful results.

## 3.1 Income Data

The first step in sourcing income data was deciding what majors to include in this project. Given the number of available majors for students to choose from, it would be challenging to include all of them. Thus, the used majors are common, interesting, and have data available. Income data for degrees ultimately eliminated many different majors from being included in the project as most income data is based on career, not major. Although this is only a slight difference, many people work outside their field of study and make significantly more or less than they would make in a career that matches their field of study. In the end, this project had 36 different majors across many disciplines. The table below contains an alphabetical listing of majors included in this project.

| | | |
|---|---|---|
| Accounting | Electrical Engineering | Music |
| Animal Science | Elementary Education | Nursing |
| Anthropology | English | Petroleum Engineering |
| Art History | Finance | Philosophy |
| Biology | Fine Arts | Physics |
| Business Management | History | Plant Science |
| Civil Engineering | Information Systems | Political Science |
| Communications | Interdisplinary Studies | Psychology |
| Computer Science | Journalism | Secondary Teacher Education |
| Criminal Justice | Marketing | Social Work |
| Drama | Mathematics | Special Needs Education |
| Economics | Mechanical Engineering | Visual and Performing Arts |

**Figure 1: Majors found in this study**

As previously stated, finding income data for different majors was surprisingly challenging because most income-related statistics are based on career choice rather than college major. However, Georgetown University conducted a study in 2015 that looked explicitly at income levels by major (Carnevale et al., 2015). This study is where all the income data for this project was found but has two significant downsides to this report. The first one is that the study was conducted in 2015. To account for the wages being six years old, the wage increase was averaged from 2010 until 2020, which was 3.17%. It was then multiplied by six so the wages would be on par with current wages (*Average wage index*, 2021). The other downside to this data source is that it reports the 25$^{th}$, median, and 75$^{th}$ percentiles rather than giving a starting salary, median salary, and peak-earning years' salary. The final model created required a starting salary, a median salary, and a yearly raise. Since the data does not give me either, I decided to take the 25$^{th}$ percentile as the starting salary and the 75$^{th}$ as the ending salary. There will be exceptions, as many students may come out of college making more or less money than the 25th percentile, but this model focuses on the average person. For the yearly change,

the 25th percentile was subtracted from the 75th percentile and was divided by years in the workforce. Years in the workforce were assumed to be 30 years for this project.

$$\frac{\text{75th Percentile - 25th Percentile}}{\text{Working career (30)}}$$

**Figure 2: Yearly raise formula**

This gives a flat raise equally distributed over the entire working career. Raises will likely not work like this in the real world and everyone's income increases will likely vary substantially. For simplicity, I chose for raises to be consistent throughout their 30-year working career.

## 3.2 Student Loan Calculator

The next important step in building the financial model was creating a student loan repayment calculator. This calculator is responsible for creating the amortization table for the student loan aspect of this model. The first step in creating this was making a basic amortization table with input for the student loan amount and interest rate. On most amortization tables, it would also be necessary for there to be a certain number of periods. Still, nearly all student loans are based on 10-year terms so that is the assumption this model will use as well (*The standard repayment plan,* n.d.). The last input that is needed is the savings rate. This is the amount of income one can expect to have to put towards savings, investments, or debt at the end of each month. Based on these variables, the calculator will calculate a monthly payment which will be separated into interest and

principal paid. The interest paid is money lost, and the principal paid will lower the total balance owed. Lastly, any money not used for the original payment left over as savings will be directly applied to the principal at the end of the period. Although one might choose to invest, save, or spend this extra money, it would be financially beneficial to them to apply this extra money directly to the principal owed. The table below represents the first few lines from the student loan calculator.

**Student Loan Calculator**

| Period | Beginning Balance | Total Payment | Interest Paid | Principle Paid | Ending Balance | Extra applied towards principle | Final Ending Balance |
|---|---|---|---|---|---|---|---|
| 1 | $37,000.00 | $392.26 | $153.86 | $238.40 | $36,761.60 | $ 424.41 | $36,337.19 |
| 2 | $36,337.19 | $392.26 | $151.10 | $241.16 | $36,096.03 | $424.41 | $35,671.63 |
| 3 | $35,671.63 | $392.26 | $148.33 | $243.93 | $35,427.70 | $424.41 | $35,003.30 |
| 4 | $35,003.30 | $392.26 | $145.56 | $246.71 | $34,756.59 | $424.41 | $34,332.18 |
| 5 | $34,332.18 | $392.26 | $142.76 | $249.50 | $34,082.69 | $424.41 | $33,658.28 |
| 6 | $33,658.28 | $392.26 | $139.96 | $252.30 | $33,405.98 | $424.41 | $32,981.58 |

| Monthly Payment/Inputs | |
|---|---|
| Loan Amount | $ 37,000.00 |
| Ending Loan Amount | $ - |
| Interest Rate | 4.99% |
| Number of Periods | 120 |
| | |
| Monthly Payment | $392.26 |

**Figure 3: Student Loan Calculator Visual**

The last aspect of this student loan calculator is that it accounts for raises. Given that student loans can take ten years to pay off, it is essential to account for raises that someone will get because they could be making significantly more in Year 10 of their career than in Year 1. To implement this, a Microsoft Excel function was used to retrieve the salary for the chosen major and multiply that value by the savings rate. The total amount saved each period would be increased, allowing more principal to be paid down at the end of each period. This addition adds another layer to calculating how long it will take for someone to pay off their student loans and could shave off years depending on the yearly salary increase the individual receives.

### 3.3 Retirement Savings

One of the ways to compare the value of different degrees is through retirement savings. Retirement planning is one of the most critical aspects of building wealth and is highly beneficial to start considering as early as possible. Although this is not the only thing someone should consider as much of retirement savings has to do with spending habits and lifestyle, it is one of the most objective ways to compare different career paths.

The first thing to consider when creating this aspect of the model was when a recent graduate would start saving for retirement. It could be argued that college graduates should begin saving for retirement even when they have student loan debt because they would receive a higher interest rate on investments than they are being charged on their student loans. While this makes sense mathematically, this model is more effective and practical if students opt to pay off their student loans before saving for retirement for a few different reasons. First, students are much more likely to worry about their student loans when they graduate than how much they could have in retirement 30 years from now. Financially savvy people could choose a different path, but the average person is more likely to focus on getting their student loans paid off before saving for retirement. The other reason to calculate it this way was for simplicity. Not only did it make the model easier to create, but it also made it much easier to explain to a user. Focusing on one financial goal at a time is much easier for people to understand than working on multiple financial goals simultaneously. Given this thinking, retirement saving begins as soon as student loans are paid off.

The next aspect to consider was the different variables required to calculate retirement savings. These variables include savings rate, stock market returns, years until

retirement, and current savings. The savings rate is one of the most critical variables, as the results vary drastically when the savings rate changes. For most comparisons, the suggested budgeting rule of 50/30/20 is used. This budgeting rule means that 50% of income is spent on necessities, 30% on wants, and 20% on outstanding debt or savings; however, there are a few exceptions, and users should consider this when comparing results (*50/30/20 budget*, 2022). If someone believes they can save more than 20% of their income, they could expect significantly higher retirement savings. On the other hand, if someone knows that they are not good at saving for long-term goals, a lower expectation should be considered.

The next variable to consider was the stock market return. In the real world, this can change significantly every year so this is an adjustable variable and most comparisons in this study will be using the average return of 10%. This has been the average return since the stock market's inception and is one of the best estimates that financial planners and economists use (Thune, 2022). The third variable that must be accounted for is years until retirement, calculated by subtracting the year that the student loans are paid off from the entire working career, which is 30 years. Although a 30-year working career might seem highly optimistic, most people would enjoy being able to retire before the age of 60, and that can be achieved through proper planning. The last thing to consider is current retirement savings. Current retirement savings is relatively straightforward and left at $0 for all calculations and comparisons in this project. It is safe to assume that the average college graduate does not have anything saved for retirement, but this model can change this input to account for savings that someone might have.

## 3.4 Payback Period

Another form of comparison that is used is payback period. Payback period is the amount of time it will take to repay the debt on a given capital project. This is one of the most common techniques used in capital budgeting for corporations and companies because of its simplicity (Kagan, 2022). Although this project is ultimately an investment in education and an analysis of an individual's finances rather than a decision made by a corporation, the payback period's methods, principles, and simplicity remain the same. For this project, a period is a month because of the monthly student loan payments and is calculated by finding what period the student loan calculator goes negative. When looking at the results, it is essential to remember that I chose not to include the four years of college in the payback period in this calculation. Instead, the results are shown in months, years, and years rounded up, and if a user was adamant about including the four years of college, they could add 48 months or four years to the results. The following excerpt from the payback period calculator illustrates the calculator's usable outputs.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 69 | $643.60 | $392.26 | $2.68 | $389.59 | $254.01 | $ | 288.29 | ($34.28) |
| 70 | ($34.28) | $392.26 | ($0.14) | $392.40 | ($426.68) | $ | 288.29 | ($714.98) |

**Figure 4: Student Loan Payoff Visual**

| | |
|---|---|
| *Payoff Time (Months)* | 69 |
| *Payoff Time (Years)* | 5.75 |
| *Payoff Time (Years Rounded Up)* | 6 |

**Figure 5: Payback Period Visual**

## 3.5 Net Present Value (NPV)

Another standard capital budgeting technique analysts and economists use to evaluate investment projects is the net present value. This technique considers the time value of money to give a single value to a project based on its future cash flows and initial investment. In the business world, net present value is used to place an objective value on one project to see if it brings value to a company or not, or it is used to compare multiple projects. Net present value is calculated using a discount rate, the initial investment, and all future cash flows (Fernando, 2022). For this model, the discount rate is the student loan interest rate, the initial investment is the amount of student loan debt, and the future cash flows are the projected yearly salaries, accounting for raises.

As stated previously, the project in this circumstance is the investment for education, and the future cash flows are the projected future salary minus the projected future salary for someone who did not attend college. This must be considered because the college degree is the added value on top of the salary that the average high school graduate could make immediately following high school. When calculating net present value, all student loan debt is front-loaded and $0 cash flows are assumed for the first four years. On the other hand, the high school graduate that immediately enters the workforce receives four years of salary cash flows while the college graduate receives nothing. Accounting for this makes the high school graduate technically have a 34-year working career when accounting for the four extra years they receive cash flows. The average high school graduate's net present value of their future salary cash flows is $573,299. This number is subtracted from the net present value of the college degree so that users can see the added value that the degree brings an individual.

## 3.6 Internal Rate of Return (IRR)

The last capital budgeting method used in this project is the internal rate of return. Like net present value and payback period, the internal rate of return is another standard method used to measure the profitability of different projects. The internal rate of return is the yearly return of all cash outflows and inflows (Fernando, 2022). This is a much easier concept for people to understand because it gives a percentage return comparable to an individual stock, a mutual fund, or a savings account. The only thing needed for this calculation is the projected cash flows over the period. It is essential, however, to account for the cost of capital when analyzing the results. If a project's internal rate of return is not greater than the cost of capital, then the project is not profitable. On the other hand, if the project's internal rate of return is greater than the cost of capital, then the project is profitable. Given its simplicity, comparing and analyzing projects based on their internal rate of return is easy.

For this model, the initial cash flow would be how much student loan debt was taken out. The rest of the cash flows would be the projected yearly salaries for a degree. Like net present value, the alternative of avoiding college and entering the workforce must also be considered. To account for this, the projected cash flows from the high school graduate are subtracted from the projected cash flows of the college graduate for each year. This includes the student loan debt and the four years of cash flows that the high school graduate receives while the college graduate is still in school. Accounting for these two variables gives an accurate return for the value of a degree above and beyond the alternative.

## 3.7 Other Assumptions

As with any model, many other assumptions were required to make this model work. Although many assumptions have already been discussed, other overarching assumptions were made when creating this model. First, I decided not to include any inflation. It is safe to say that America will face a great deal of inflation over a 30-year working career, but this would affect many different aspects of the model, such as student loan interest rates, the cost of college, future salaries, and projected stock market returns. Given the unpredictability of any of this, this model avoids accounting for inflation altogether.

Another aspect this model omits is taxes. Taxes are critical in any long-term financial planning, but taxes are unique and circumstantial. If taxes were included, it would require different state tax rates and projecting future tax laws. This would mainly affect the projected salaries and ultimately diminish the projected retirement savings, net present values, and internal rates of returns for most degrees as they would be taxed at a higher rate than the average high school graduate. Although taxes were not accounted for, this is something that readers might want to consider when looking at the results.

The next assumption made was that the savings rate would remain constant over the entire period of someone's working career. It is evident that someone will not have the same savings rate throughout their life due to emergencies, changes in the family, and potentially playing catch up on their retirement. It is also apparent that it is much easier for someone to have a higher savings rate when they are making more money and getting raises, but it should also be considered that most people do not change their spending habits based on their income. Because these factors could increase or decrease someone's

savings rate, a flat savings rate over the duration is a better way to project what savings rate someone will have accurately.

## 3.8 MTSU Model

One of the key aspects of this project was creating a separate model that focused on MTSU. Although both models work practically the same, the MTSU model uses income data based solely on MTSU graduates. The difficulty in this process was using data from a different source than the first model. For most degrees, income data was relatively similar to the first model's data; however, a few other assumptions had to be made when calculating their starting salaries.

The data for MTSU graduates gave income data for each major three years after graduation rather than a starting salary (*MTSU college scorecard*, 2022). To format this data the same as the data from the first model, the income data for MTSU was divided by the projected year three income data from the other source to get a percentage. This gave me a relative difference for MTSU graduates compared to the average so that raises could be accounted for more accurately. After this, I multiplied the percentage by the yearly raise from the original data to get a raise per year that MTSU graduates could expect to receive. Lastly, I took this raise per year and backtracked it for three years to get the starting salary and then added it from year 3 to year 30 to fill in the rest of the income data. This process was repeated for each MTSU major with data.

There was a different process for majors without MTSU-specific data for finding a starting salary. First, all the relative differences from the previous step were averaged. This gave me the average difference an MTSU graduate can expect to make compared to

the average college graduate. This average percentage was then multiplied by the starting salary from the other data to arrive at a starting projected salary for MTSU students. Lastly, the projected yearly raise was added to the projected MTSU starting salary for 30 years to get all the yearly salaries. This process was repeated for all the majors in which there was not any MTSU-specific data.

The last aspect to consider was Tennessee's lower income and cost of living. It would be unfair to compare an MTSU graduate to the average high school graduate because Tennessee has a lower income than the rest of America due to its low cost of living. Tennessee residents expect an income of roughly 15% less than the average American (*Median household income,* 2022). To account for this, 15% was subtracted from the average high school graduate's income to compare Tennessee residents better.

## 3.9 Tables

The end goal of creating this model was to compile the data in tables and graphs so readers could easily compare the different degree choices under different circumstances and variable changes. To make these tables, certain model variables would be changed and then ordered in a way that is easy to understand for the readers. These tables range from comparing degrees' internal rates of returns to comparing degrees based on how much debt someone could take out and still become a millionaire for different degrees. Inherently, every possible situation was not covered as there are a limitless number of comparisons and situations to be compared; however, this was a relatively straightforward process, and it would be easy for users to change the variables to accommodate their circumstances.

Although every situation could not be accommodated, the variables that made the most significant difference in outcomes were emphasized, such as the savings rate, stock market interest rate, and total student loan debt. I also focused many comparisons on the most likely variables because this would be useful to the most amount of people possible. This baseline consisted of a 4.99% student loan interest rate, a 10% stock market return, and $37,000 in student loan debt (Calonia, 2022; Thune, 2022; Hanson, 2022). These are the average conditions that most students should expect or have experienced and should be the focal point of many comparisons.

## 3.10 Limitations

Although this model and project answer many questions that people may have about student debt and degree choice, there are some limitations. The most apparent one is income data. Almost all income data research studies look at how much people make in a particular occupation or career field. While this data can be helpful, just under 30% of the population work in a career related to their major (Plumer, 2013). This is due to multiple reasons, but the important takeaway is that income related to occupation rather than major is not useful in this study. Because of the lack of data, I could only compile data from one source for each model.

Another limitation when compiling the income data was the uniformity between the two models. In the general model, the starting salaries were calculated by using the income from the $25^{th}$ percentile. In the MTSU model, I backtracked from the year three salary and estimated the starting salary. While neither of these two ways is better than having factual data, this was the most effective way to compare the two data sets.

If these limitations were to be fixed by obtaining data catered to this model, the findings would be more accurate. I did not have time or resources to source any data myself as it would not have been abundant enough to be useful for this study; however, this model could be easily modified to accommodate better data in the future. Since I had to use the data I could find, this model, while not perfect, still accomplishes my original goal to give people an idea of what to expect out of a college degree while accounting for student debt.

# 4. Results

This section shows the findings of my financial model. There are numerous different comparisons and analyses that could be made with the data. Still, the comparisons this study focuses on will hopefully be useful to the greatest number of readers. I will also focus on changing variables that make the most significant difference within the results so that readers can see what variables are more important than others.

## 4.1 The Average College Graduate

The first analysis is based on the average college graduate. For this analysis, averages for each variable were used so that this would be a baseline for the study. These variables consisted of a 4.99% student loan interest rate, $37,000 in student loan debt, a 10% stock market return, and a 20% savings rate (Calonia, 2022; Thune, 2022; Hanson, 2022; 50/30/20 budget calculator, 2022). These variables are what the average college student faces once they graduate, so it is important to see the outcomes when all these variables are in place. The figure below is based on this analysis along with accompanying figures ranking each aspect of the average college graduate.

## Table 1: The Average College Graduate

| The Average College Graduate | | | | | |
|---|---|---|---|---|---|
| Major | Retirement Savings | Payback Period (Months) | Payback Period (Years) | Net Present Value | Internal Rate of Return |
| *Accounting* | $ 1,627,650.85 | 42 | 3.5 | $ 374,441.57 | 14.42% |
| *Animal Science* | $ 1,061,291.25 | 58 | 4.83 | $ 105,059.17 | 8.20% |
| *Anthropology* | $ 1,008,931.49 | 60 | 5 | $ 79,801.59 | 7.51% |
| *Art History* | $ 1,057,717.88 | 58 | 4.83 | $ 99,543.83 | 8.07% |
| *Biology* | $ 1,284,553.89 | 51 | 4.25 | $ 192,739.67 | 10.49% |
| *Business Management* | $ 1,430,096.80 | 46 | 3.83 | $ 278,312.31 | 12.53% |
| *Civil Engineering* | $ 2,152,510.99 | 33 | 2.75 | $ 541,480.90 | 18.56% |
| *Communications* | $ 1,248,534.42 | 52 | 4.33 | $ 184,028.11 | 10.23% |
| *Computer Science* | $ 1,971,836.21 | 35 | 2.92 | $ 523,925.78 | 17.64% |
| *Criminal Justice* | $ 1,265,523.46 | 51 | 4.25 | $ 165,162.96 | 9.94% |
| *Drama* | $ 969,282.23 | 62 | 5.17 | $ 22,286.50 | 5.77% |
| *Economics* | $ 1,717,189.94 | 41 | 3.42 | $ 466,036.82 | 15.70% |
| *Electrical Engineering* | $ 2,403,453.11 | 30 | 2.5 | $ 663,827.50 | 20.47% |
| *Elementary Education* | $ 961,555.58 | 60 | 5 | $ (21,793.68) | 4.04% |
| *English* | $ 1,201,834.73 | 53 | 4.42 | $ 158,770.54 | 9.63% |
| *Finance* | $ 1,732,590.87 | 40 | 3.33 | $ 425,263.87 | 15.33% |
| *Fine Arts* | $ 1,012,440.82 | 60 | 5 | $ 85,316.93 | 7.65% |
| *History* | $ 1,252,306.43 | 52 | 4.33 | $ 189,543.46 | 10.34% |
| *Information Systems* | $ 1,886,342.09 | 37 | 3.08 | $ 444,178.36 | 16.09% |
| *Interdisplinary Studies* | $ 1,049,286.12 | 57 | 4.75 | $ 17,690.79 | 5.70% |
| *Journalism* | $ 1,303,832.05 | 50 | 4.17 | $ 203,770.35 | 10.70% |
| *Marketing* | $ 1,424,125.63 | 46 | 3.83 | $ 267,281.62 | 12.35% |
| *Mathematics* | $ 1,615,273.28 | 42 | 3.5 | $ 393,153.15 | 14.55% |
| *Mechanical Engineering* | $ 2,355,246.31 | 30 | 2.5 | $ 616,193.75 | 19.89% |
| *Music* | $ 1,043,424.40 | 58 | 4.83 | $ 77,482.46 | 7.50% |
| *Nursing* | $ 1,773,399.44 | 38 | 3.17 | $ 319,491.06 | 14.30% |
| *Petroleum Engineering* | $ 3,479,212.11 | 22 | 1.83 | $ 1,548,341.09 | 29.62% |
| *Philosophy* | $ 1,019,459.47 | 60 | 5 | $ 96,347.62 | 7.93% |
| *Physics* | $ 1,646,217.21 | 42 | 3.5 | $ 448,306.56 | 15.24% |
| *Plant Science* | $ 1,190,620.10 | 53 | 4.42 | $ 142,224.51 | 9.28% |
| *Political Science* | $ 1,467,064.07 | 45 | 3.75 | $ 322,435.04 | 13.21% |
| *Psychology* | $ 1,083,541.16 | 57 | 4.75 | $ 97,224.70 | 8.08% |
| *Secondary Teacher Education* | $ 1,117,957.44 | 55 | 4.58 | $ 65,009.73 | 7.32% |
| *Social Work* | $ 913,783.57 | 64 | 5.33 | $ (27,351.57) | 3.87% |
| *Special Needs Education* | $ 1,045,680.32 | 57 | 4.75 | $ 12,175.45 | 5.49% |
| *Visual and Performing Arts* | $ 889,022.91 | 66 | 5.5 | $ (359.39) | 4.98% |
| | | | | | |
| *Medians* | $ 1,258,914.94 | 51.5 | 4.29 | $ 186,785.79 | 10.28% |
| *Averages* | $ 1,435,077.46 | 48.97 | 4.08 | $ 266,037.31 | 11.46% |

**Table 2: The Average College Graduate Ranked by Retirement Savings**

| Major | Retirement Savings |
|---|---|
| *Petroleum Engineering* | $ 3,479,212.11 |
| *Electrical Engineering* | $ 2,403,453.11 |
| *Mechanical Engineering* | $ 2,355,246.31 |
| *Civil Engineering* | $ 2,152,510.99 |
| *Computer Science* | $ 1,971,836.21 |
| *Information Systems* | $ 1,886,342.09 |
| *Nursing* | $ 1,773,399.44 |
| *Finance* | $ 1,732,590.87 |
| *Economics* | $ 1,717,189.94 |
| *Physics* | $ 1,646,217.21 |
| *Accounting* | $ 1,627,650.85 |
| *Mathematics* | $ 1,615,273.28 |
| *Political Science* | $ 1,467,064.07 |
| *Business Management* | $ 1,430,096.80 |
| *Marketing* | $ 1,424,125.63 |
| *Journalism* | $ 1,303,832.05 |
| *Biology* | $ 1,284,553.89 |
| *Criminal Justice* | $ 1,265,523.46 |
| *History* | $ 1,252,306.43 |
| *Communications* | $ 1,248,534.42 |
| *English* | $ 1,201,834.73 |
| *Plant Science* | $ 1,190,620.10 |
| *Secondary Teacher Education* | $ 1,117,957.44 |
| *Psychology* | $ 1,083,541.16 |
| *Animal Science* | $ 1,061,291.25 |
| *Art History* | $ 1,057,717.88 |
| *Interdisplinary Studies* | $ 1,049,286.12 |
| *Special Needs Education* | $ 1,045,680.32 |
| *Music* | $ 1,043,424.40 |
| *Philosophy* | $ 1,019,459.47 |
| *Fine Arts* | $ 1,012,440.82 |
| *Anthropology* | $ 1,008,931.49 |
| *Drama* | $ 969,282.23 |
| *Elementary Education* | $ 961,555.58 |
| *Social Work* | $ 913,783.57 |
| *Visual and Performing Arts* | $ 889,022.91 |

In table 2, the four engineering degrees listed in this study rank one through four for retirement savings. This is not surprising as it is known engineering is a great major and should be expected to rank well; however, it is surprising that they are in the top four by such a significant margin. Next, almost everything else that falls within the category of STEM or business proves to be average to above average in retirement savings. This is expected as degrees that fall in these two categories are often considered safe majors with stable outcomes. Lastly, majors under the umbrella of liberal arts or education all prove to have very poor retirement savings.

**Table 3: The Average College Table 2: Graduate Ranked by Payback Period**

| Major | Payback Period (Months) | Payback Period (Years) |
|---|---|---|
| Petroleum Engineering | 22 | 1.83 |
| Electrical Engineering | 30 | 2.5 |
| Mechanical Engineering | 30 | 2.5 |
| Civil Engineering | 33 | 2.75 |
| Computer Science | 35 | 2.92 |
| Information Systems | 37 | 3.08 |
| Nursing | 38 | 3.17 |
| Finance | 40 | 3.33 |
| Economics | 41 | 3.42 |
| Accounting | 42 | 3.5 |
| Mathematics | 42 | 3.5 |
| Physics | 42 | 3.5 |
| Political Science | 45 | 3.75 |
| Business Management | 46 | 3.83 |
| Marketing | 46 | 3.83 |
| Journalism | 50 | 4.17 |
| Biology | 51 | 4.25 |
| Criminal Justice | 51 | 4.25 |
| Communications | 52 | 4.33 |
| History | 52 | 4.33 |
| English | 53 | 4.42 |
| Plant Science | 53 | 4.42 |
| Secondary Teacher Education | 55 | 4.58 |
| Interdisplinary Studies | 57 | 4.75 |
| Psychology | 57 | 4.75 |
| Special Needs Education | 57 | 4.75 |
| Animal Science | 58 | 4.83 |
| Art History | 58 | 4.83 |
| Music | 58 | 4.83 |
| Anthropology | 60 | 5 |
| Elementary Education | 60 | 5 |
| Fine Arts | 60 | 5 |
| Philosophy | 60 | 5 |
| Drama | 62 | 5.17 |
| Social Work | 64 | 5.33 |
| Visual and Performing Arts | 66 | 5.5 |

In table 3, the four engineering majors all had short payback periods. This is due to the high starting salary that these majors can expect to receive. STEM, nursing, and business majors also fared well as they were all above average. One aspect of table 3 that is interesting is that the median is 4.29 years, and the slowest payoff period is just over 5.5 years. This is interesting because this means that all the majors on the lower half of the list have a relatively equal starting salary and yearly raise.

**Table 4: The Average College Graduate Ranked by Net Present Value**

| Major | Net Present Value |
|---|---|
| Petroleum Engineering | $ 1,548,341.09 |
| Electrical Engineering | $ 663,827.50 |
| Mechanical Engineering | $ 616,193.75 |
| Civil Engineering | $ 541,480.90 |
| Computer Science | $ 523,925.78 |
| Economics | $ 466,036.82 |
| Physics | $ 448,306.56 |
| Information Systems | $ 444,178.36 |
| Finance | $ 425,263.87 |
| Mathematics | $ 393,153.15 |
| Accounting | $ 374,441.57 |
| Political Science | $ 322,435.04 |
| Nursing | $ 319,491.06 |
| Business Management | $ 278,312.31 |
| Marketing | $ 267,281.62 |
| Journalism | $ 203,770.35 |
| Biology | $ 192,739.67 |
| History | $ 189,543.46 |
| Communications | $ 184,028.11 |
| Criminal Justice | $ 165,162.96 |
| English | $ 158,770.54 |
| Plant Science | $ 142,224.51 |
| Animal Science | $ 105,059.17 |
| Art History | $ 99,543.83 |
| Psychology | $ 97,224.70 |
| Philosophy | $ 96,347.62 |
| Fine Arts | $ 85,316.93 |
| Anthropology | $ 79,801.59 |
| Music | $ 77,482.46 |
| Secondary Teacher Education | $ 65,009.73 |
| Drama | $ 22,286.50 |
| Interdisplinary Studies | $ 17,690.79 |
| Special Needs Education | $ 12,175.45 |
| Visual and Performing Arts | $ (359.39) |
| Elementary Education | $ (21,793.68) |
| Social Work | $ (27,351.57) |

In table 4, all the engineering degrees have net present values of at least $500,000; however, petroleum engineering's net present value is over double of electrical engineering which has the second best. Like the first two tables, STEM and most business degrees have above-average net present value. The unique part of this table is that visual and performing arts, elementary education, and social work all have negative net present values. In theory, this means someone looking to major in one of these areas would have to get paid to attend college.

**Table 5: The Average College Graduate Ranked by Internal Rate of Return**

| Major | Internal Rate of Return |
|---|---|
| Petroleum Engineering | 29.62% |
| Electrical Engineering | 20.47% |
| Mechanical Engineering | 19.89% |
| Civil Engineering | 18.56% |
| Computer Science | 17.64% |
| Information Systems | 16.09% |
| Economics | 15.70% |
| Finance | 15.33% |
| Physics | 15.24% |
| Mathematics | 14.55% |
| Accounting | 14.42% |
| Nursing | 14.30% |
| Political Science | 13.21% |
| Business Management | 12.53% |
| Marketing | 12.35% |
| Journalism | 10.70% |
| Biology | 10.49% |
| History | 10.34% |
| Communications | 10.23% |
| Criminal Justice | 9.94% |
| English | 9.63% |
| Plant Science | 9.28% |
| Animal Science | 8.20% |
| Psychology | 8.08% |
| Art History | 8.07% |
| Philosophy | 7.93% |
| Fine Arts | 7.65% |
| Anthropology | 7.51% |
| Music | 7.50% |
| Secondary Teacher Education | 7.32% |
| Drama | 5.77% |
| Interdisplinary Studies | 5.70% |
| Special Needs Education | 5.49% |
| Visual and Performing Arts | 4.98% |
| Elementary Education | 4.04% |
| Social Work | 3.87% |

Given that the minimum return is 4.99%, all but three would be considered positive investments. The three that would not give positive returns are social work, elementary education, and visual and performing arts. On the other hand, petroleum engineering gave nearly a 1/3 higher return than electrical engineering which was second. Also, like the other tables, the four engineering majors are the top 4, with the lowest one returning over 18%.

## 4.2 Other Comparisons and Analysis

### Table 6: $0 Net Present Value Analysis

| NPV=0 | |
|---|---|
| Major | Student Debt |
| Petroleum Engineering | $ 1,349,425.77 |
| Electrical Engineering | $ 537,051.77 |
| Mechanical Engineering | $ 491,899.47 |
| Civil Engineering | $ 427,112.42 |
| Computer Science | $ 421,964.55 |
| Economics | $ 391,666.60 |
| Physics | $ 378,576.77 |
| Information Systems | $ 358,207.08 |
| Finance | $ 348,573.44 |
| Mathematics | $ 323,423.36 |
| Accounting | $ 302,391.56 |
| Political Science | $ 259,665.88 |
| Nursing | $ 235,839.99 |
| Business Management | $ 217,497.89 |
| Marketing | $ 208,519.49 |
| Journalism | $ 170,702.04 |
| Biology | $ 162,164.34 |
| History | $ 160,700.83 |
| Communications | $ 156,523.75 |
| Criminal Justice | $ 142,838.14 |
| English | $ 139,488.02 |
| Plant Science | $ 126,212.60 |
| Animal Science | $ 101,720.34 |
| Art History | $ 99,413.62 |
| Philosophy | $ 97,309.47 |
| Psychology | $ 96,002.43 |
| Fine Arts | $ 89,548.44 |
| Anthropology | $ 84,886.08 |
| Music | $ 84,257.81 |
| Secondary Teacher Education | $ 76,133.92 |
| Drama | $ 50,581.73 |
| Interdisplinary Studies | $ 46,396.90 |
| Special Needs Education | $ 43,909.54 |
| Visual and Performing Arts | $ 36,640.61 |
| Elementary Education | $ 22,912.09 |
| Social Work | $ 21,694.83 |

Table 6 looks at how much student debt a prospective student could take out to get a net present value of $0 and an IRR equivalent to the discount rate. A 4.99% student loan interest rate was used along with a 20% savings rate (Calonia, 2022; 50/30/20 budget calculator, 2022). This is useful because it gives prospective students an idea of the maximum amount of student loan debt they should take out for a given major. It is important to remember that this is the maximum amount of student debt to receive a positive NPV, but it is not recommended. There should be a cushion for variability and taking out the maximum amount of student debt possible does not leave any room for

underperformance or error. This data should be interpreted as a reference point when comparing different majors. For example, if prospective students plan to take out $50,000 in student debt and debate between psychology and drama, they should choose psychology. While both make sense in theory and should return positive results, one leaves the student with a cushion while the other does not.

**Table 7: How Savings Rate Affects Retirement Savings**

| Major | 30% Savings, 10% Return | 20% Savings, 10% Return | 10% Savings, 10% Return |
|---|---|---|---|
| Accounting | $ 2,667,270.44 | $ 1,627,650.85 | $ 628,975.61 |
| Animal Science | $ 1,837,536.86 | $ 1,061,291.25 | $ 350,975.97 |
| Anthropology | $ 1,748,341.70 | $ 1,008,931.49 | $ 335,773.10 |
| Art History | $ 1,832,726.55 | $ 1,057,717.88 | $ 348,716.47 |
| Biology | $ 2,093,580.93 | $ 1,284,553.89 | $ 447,279.01 |
| Business Management | $ 2,389,679.74 | $ 1,430,096.80 | $ 524,303.83 |
| Civil Engineering | $ 3,470,588.00 | $ 2,152,510.99 | $ 524,303.83 |
| Communications | $ 2,047,056.90 | $ 1,248,534.42 | $ 852,157.05 |
| Computer Science | $ 3,183,610.83 | $ 1,971,836.21 | $ 428,536.42 |
| Criminal Justice | $ 2,076,965.20 | $ 1,265,523.46 | $ 774,850.75 |
| Drama | $ 1,653,185.59 | $ 969,282.23 | $ 427,442.39 |
| Economics | $ 2,793,555.50 | $ 1,717,189.94 | $ 288,312.77 |
| Electrical Engineering | $ 3,831,483.11 | $ 2,403,453.11 | $ 984,624.15 |
| Elementary Education | $ 1,711,568.54 | $ 961,555.58 | $ 270,432.91 |
| English | $ 1,972,934.12 | $ 1,201,834.73 | $ 415,975.60 |
| Finance | $ 2,811,236.23 | $ 1,732,590.87 | $ 662,758.56 |
| Fine Arts | $ 1,753,066.95 | $ 1,012,440.82 | $ 338,188.74 |
| History | $ 2,050,380.05 | $ 1,252,306.43 | $ 434,901.11 |
| Information Systems | $ 3,052,216.07 | $ 1,886,342.09 | $ 723,490.18 |
| Interdisplinary Studies | $ 1,849,132.94 | $ 1,049,286.12 | $ 314,640.06 |
| Journalism | $ 2,100,227.21 | $ 1,303,832.05 | $ 451,956.43 |
| Marketing | $ 2,382,793.05 | $ 1,424,125.63 | $ 514,982.10 |
| Mathematics | $ 2,635,725.85 | $ 1,615,273.28 | $ 627,336.59 |
| Mechanical Engineering | $ 3,763,769.12 | $ 2,355,246.31 | $ 949,896.59 |
| Music | $ 1,797,385.35 | $ 1,043,424.40 | $ 342,315.57 |
| Nursing | $ 2,926,240.17 | $ 1,773,399.44 | $ 642,569.72 |
| Petroleum Engineering | $ 5,551,070.18 | $ 3,479,212.11 | $ 1,600,896.99 |
| Philosophy | $ 1,762,517.44 | $ 1,019,459.47 | $ 346,347.97 |
| Physics | $ 2,670,775.39 | $ 1,646,217.21 | $ 638,335.66 |
| Plant Science | $ 1,963,052.98 | $ 1,190,620.10 | $ 404,656.75 |
| Political Science | $ 2,417,226.48 | $ 1,467,064.07 | $ 552,480.81 |
| Psychology | $ 1,866,398.69 | $ 1,083,541.16 | $ 356,242.66 |
| Secondary Teacher Education | $ 1,899,953.56 | $ 1,117,957.44 | $ 349,594.55 |
| Social Work | $ 1,596,706.92 | $ 913,783.57 | $ 257,915.29 |
| Special Needs Education | $ 1,844,279.57 | $ 1,045,680.32 | $ 312,200.99 |
| Visual and Performing Arts | $ 1,522,809.20 | $ 889,022.91 | $ 265,814.73 |

In table 7, retirement savings are compared at different savings rates. This is important because an individual's savings rate is one of the largest factors when calculating retirement. This is important to this study because if individuals know their saving habits, the information presented can be much more useful. An individual who is a saver can take out more debt than average for a less desirable degree and still reach their retirement goals. On the other hand, an individual with poor money habits should avoid

going into much debt and look for majors with high salaries, or they will not be able to reach their retirement goals.

**Table 8: Payback Period for Different Student Debt Levels**

| Major | $37,000.00 | $10,000.00 | $30,000.00 | $50,000.00 |
|---|---|---|---|---|
| Accounting | 42 | 11 | 34 | 57 |
| Animal Science | 58 | 16 | 47 | 79 |
| Anthropology | 60 | 16 | 48 | 82 |
| Art History | 58 | 16 | 47 | 79 |
| Biology | 51 | 14 | 41 | 69 |
| Business Management | 46 | 13 | 37 | 62 |
| Civil Engineering | 33 | 9 | 26 | 44 |
| Communications | 52 | 14 | 42 | 71 |
| Computer Science | 35 | 10 | 28 | 48 |
| Criminal Justice | 51 | 14 | 41 | 70 |
| Drama | 62 | 17 | 50 | 86 |
| Economics | 41 | 11 | 33 | 55 |
| Electrical Engineering | 30 | 8 | 24 | 41 |
| Elementary Education | 60 | 16 | 48 | 84 |
| English | 53 | 14 | 43 | 73 |
| Finance | 40 | 11 | 32 | 54 |
| Fine Arts | 60 | 16 | 48 | 82 |
| History | 52 | 14 | 42 | 70 |
| Information Systems | 37 | 10 | 30 | 51 |
| Interdisplinary Studies | 57 | 15 | 45 | 79 |
| Journalism | 50 | 14 | 41 | 69 |
| Marketing | 46 | 13 | 37 | 63 |
| Mathematics | 42 | 12 | 34 | 57 |
| Mechanical Engineering | 30 | 8 | 25 | 41 |
| Music | 58 | 16 | 47 | 80 |
| Nursing | 38 | 10 | 31 | 53 |
| Petroleum Engineering | 22 | 6 | 18 | **29** |
| Philosophy | 60 | 16 | 48 | 81 |
| Physics | 42 | 12 | 34 | 57 |
| Plant Science | 53 | 14 | 43 | 73 |
| Political Science | 45 | 13 | 37 | 62 |
| Psychology | 57 | 15 | 46 | 78 |
| Secondary Teacher Education | 55 | 15 | 44 | 75 |
| Social Work | 64 | 17 | 51 | 88 |
| Special Needs Education | 57 | 15 | 46 | 79 |
| Visual and Performing Arts | 66 | 18 | 53 | 91 |

Lastly, in the payback period for different student loan amounts table, I used different student debt amounts and looked at the differences in payback period. This table is relatively straightforward without any surprises among the results, but a unique trend can be seen in this table. When looking at all the results for the same major, the payback period does not increase consistently. The more debt an individual takes out, the payback period grows significantly. This is due to compound interest working against the individual rather than being used to their advantage.

## 4.2 The Average MTSU Graduate

This analysis focuses on the average MTSU graduate like the average college graduate. Although the analysis techniques, comparisons, and tables are the same, there is a difference in the average student loan debt. The average MTSU graduate has $20,500 in student loan debt (*MTSU college scorecard,* 2022). This amount is nearly half the average college graduate and must be accounted for, or the results would be drastically different. The other aspect to remember is that the average high school graduate is slightly different from the average MTSU graduate than the average college graduate. As previously stated, the incomes in Tennessee are 15% less than the national average. Furthermore, 79% of all MTSU graduates remain in Tennessee (*The value of a broad-based education,* n.d.). This is important because Tennessee has a lower cost of living relative to the rest of the country, leading to lower incomes. Given this, these facts were accounted for in the data input into this model so that the results give a fair representation of MTSU graduate outcomes.

## Table 9: The Average MTSU Graduate

| The Average MTSU Graduate | | | | | |
|---|---|---|---|---|---|
| Major | Retirement Savings | Payback Period (Months) | Payback Period (Years) | Net Present Value | Internal Rate of Return |
| *Accounting* | $ 1,621,035.85 | 26 | 2.17 | $ 381,083.40 | 16.88% |
| *Animal Science* | $ 777,014.42 | 47 | 3.92 | $ (12,308.12) | 4.42% |
| *Anthropology* | $ 477,689.85 | 68 | 5.67 | $ (170,495.89) | -12.35% |
| *Art History* | $ 916,691.92 | 41 | 3.42 | $ 42,123.92 | 6.78% |
| *Biology* | $ 987,961.59 | 39 | 3.25 | $ 70,447.47 | 7.89% |
| *Business Management* | $ 1,283,873.08 | 31 | 2.58 | $ 220,484.31 | 12.82% |
| *Communications* | $ 982,473.85 | 39 | 3.25 | $ 72,949.33 | 7.94% |
| *Computer Science* | $ 2,005,333.64 | 21 | 1.75 | $ 554,037.71 | 21.39% |
| *Criminal Justice* | $ 1,148,665.41 | 34 | 2.83 | $ 145,832.75 | 10.69% |
| *Drama* | $ 946,433.31 | 40 | 3.33 | $ 38,905.50 | 6.71% |
| *Economics* | $ 1,410,268.82 | 29 | 2.42 | $ 325,472.45 | 15.10% |
| *Elementary Education* | $ 848,968.49 | 43 | 3.58 | $ (50,462.90) | 1.73% |
| *English* | $ 986,824.35 | 39 | 3.25 | $ 73,366.97 | 7.97% |
| *Finance* | $ 1,312,318.84 | 31 | 2.58 | $ 249,376.89 | 13.49% |
| *Fine Arts* | $ 861,929.80 | 43 | 3.58 | $ 23,139.22 | 5.99% |
| *History* | $ 876,750.68 | 43 | 3.58 | $ 31,751.20 | 6.35% |
| *Information Systems* | $ 1,590,416.17 | 26 | 2.17 | $ 325,946.62 | 15.98% |
| *Interdisplinary Studies* | $ 897,167.32 | 41 | 3.42 | $ (29,062.15) | 3.27% |
| *Journalism* | $ 1,530,528.59 | 27 | 2.25 | $ 284,774.51 | 15.09% |
| *Marketing* | $ 1,395,154.12 | 29 | 2.42 | $ 287,884.00 | 14.46% |
| *Mathematics* | $ 1,352,884.78 | 30 | 2.5 | $ 282,799.03 | 14.21% |
| *Music* | $ 931,010.94 | 41 | 3.42 | $ 40,485.51 | 6.76% |
| *Nursing* | $ 1,769,470.74 | 23 | 1.92 | $ 353,710.70 | 17.83% |
| *Philosophy* | $ 881,470.60 | 43 | 3.58 | $ 39,445.84 | 6.64% |
| *Physics* | $ 1,348,184.99 | 30 | 2.5 | $ 311,450.49 | 14.61% |
| *Plant Science* | $ 811,952.78 | 45 | 3.75 | $ (10,427.95) | 4.49% |
| *Political Science* | $ 1,026,437.39 | 38 | 3.17 | $ 105,371.07 | 9.00% |
| *Psychology* | $ 838,355.47 | 44 | 3.67 | $ (879.66) | 4.95% |
| *Secondary Teacher Education* | $ 972,817.17 | 39 | 3.25 | $ 16,490.25 | 5.82% |
| *Social Work* | $ 858,835.14 | 43 | 3.58 | $ (25,288.72) | 3.60% |
| *Special Needs Education* | $ 923,044.35 | 40 | 3.33 | $ (24,064.26) | 3.56% |
| *Visual and Performing Arts* | $ 761,647.85 | 47 | 3.92 | $ (31,715.81) | 3.41% |
| | | | | | |
| *Medians* | $ 977,645.51 | 39 | 3.25 | $ 56,285.70 | 7.34% |
| *Averages* | $ 1,104,175.38 | 37.50 | 3.13 | $ 122,581.99 | 8.67% |

**Table 10: The Average MTSU Graduate Ranked by Retirement Savings**

| Major | Retirement Savings |
|---|---|
| Computer Science | $ 2,005,333.64 |
| Nursing | $ 1,769,470.74 |
| Accounting | $ 1,621,035.85 |
| Information Systems | $ 1,590,416.17 |
| Journalism | $ 1,530,528.59 |
| Economics | $ 1,410,268.82 |
| Marketing | $ 1,395,154.12 |
| Mathematics | $ 1,352,884.78 |
| Physics | $ 1,348,184.99 |
| Finance | $ 1,312,318.84 |
| Business Management | $ 1,283,873.08 |
| Criminal Justice | $ 1,148,665.41 |
| Political Science | $ 1,026,437.39 |
| Biology | $ 987,961.59 |
| English | $ 986,824.35 |
| Communications | $ 982,473.85 |
| Secondary Teacher Education | $ 972,817.17 |
| Drama | $ 946,433.31 |
| Music | $ 931,010.94 |
| Special Needs Education | $ 923,044.35 |
| Art History | $ 916,691.92 |
| Interdisplinary Studies | $ 897,167.32 |
| Philosophy | $ 881,470.60 |
| History | $ 876,750.68 |
| Fine Arts | $ 861,929.80 |
| Social Work | $ 858,835.14 |
| Elementary Education | $ 848,968.49 |
| Psychology | $ 838,355.47 |
| Plant Science | $ 811,952.78 |
| Animal Science | $ 777,014.42 |
| Visual and Performing Arts | $ 761,647.85 |
| Anthropology | $ 477,689.85 |

There are two outliers when looking at table 10 results. The first is that computer science has the largest retirement savings of just over 2 million U.S. dollars. The other outlier is anthropology being last at $470,000. Outside of these two results, all the other majors have relatively gradual increases between them. The final aspect of table 10 that is interesting is that only 13 majors allow someone to become a millionaire. The list of 13 includes almost solely STEM or business majors.

**Table 11: The Average MTSU Graduate Ranked by Payback Period**

| Major | Payback Period (Months) | Payback Period (Years) |
|---|---|---|
| Computer Science | 21 | 1.75 |
| Nursing | 23 | 1.92 |
| Accounting | 26 | 2.17 |
| Information Systems | 26 | 2.17 |
| Journalism | 27 | 2.25 |
| Economics | 29 | 2.42 |
| Marketing | 29 | 2.42 |
| Mathematics | 30 | 2.5 |
| Physics | 30 | 2.5 |
| Business Management | 31 | 2.58 |
| Finance | 31 | 2.58 |
| Criminal Justice | 34 | 2.83 |
| Political Science | 38 | 3.17 |
| Biology | 39 | 3.25 |
| Communications | 39 | 3.25 |
| English | 39 | 3.25 |
| Secondary Teacher Education | 39 | 3.25 |
| Drama | 40 | 3.33 |
| Special Needs Education | 40 | 3.33 |
| Art History | 41 | 3.42 |
| Interdisplinary Studies | 41 | 3.42 |
| Music | 41 | 3.42 |
| Elementary Education | 43 | 3.58 |
| Fine Arts | 43 | 3.58 |
| History | 43 | 3.58 |
| Philosophy | 43 | 3.58 |
| Social Work | 43 | 3.58 |
| Psychology | 44 | 3.67 |
| Plant Science | 45 | 3.75 |
| Animal Science | 47 | 3.92 |
| Visual and Performing Arts | 47 | 3.92 |
| Anthropology | 68 | 5.67 |

It can be seen in table 11 that the range of payback periods for MTSU degrees is relatively quicker than in table 3. This is because MTSU graduates have significantly less debt than the average college student. Another stand out in table 11 is the fact that anthropology is a significant outlier. Its payback period is 21 months longer than the major in front of it, visual and performing arts. Outside of this outlier, there is only a 26-month difference in payoff between the best and second-to-worst major.

**Table 12: The Average MTSU Graduate Ranked by Net Present Value (NPV)**

| Major | Net Present Value |
|---|---|
| Computer Science | $ 554,037.71 |
| Accounting | $ 381,083.40 |
| Nursing | $ 353,710.70 |
| Information Systems | $ 325,946.62 |
| Economics | $ 325,472.45 |
| Physics | $ 311,450.49 |
| Marketing | $ 287,884.00 |
| Journalism | $ 284,774.51 |
| Mathematics | $ 282,799.03 |
| Finance | $ 249,376.89 |
| Business Management | $ 220,484.31 |
| Criminal Justice | $ 145,832.75 |
| Political Science | $ 105,371.07 |
| English | $ 73,366.97 |
| Communications | $ 72,949.33 |
| Biology | $ 70,447.47 |
| Art History | $ 42,123.92 |
| Music | $ 40,485.51 |
| Philosophy | $ 39,445.84 |
| Drama | $ 38,905.50 |
| History | $ 31,751.20 |
| Fine Arts | $ 23,139.22 |
| Secondary Teacher Education | $ 16,490.25 |
| Psychology | $ (879.66) |
| Plant Science | $ (10,427.95) |
| Animal Science | $ (12,308.12) |
| Special Needs Education | $ (24,064.26) |
| Social Work | $ (25,288.72) |
| Interdisplinary Studies | $ (29,062.15) |
| Visual and Performing Arts | $ (31,715.81) |
| Elementary Education | $ (50,462.90) |
| Anthropology | $ (170,495.89) |

The apparent finding in table 12 is that nine majors have a negative net present value. This is over 1/3 of all the majors on this list from MTSU, which is significantly more than the average NPV from table 4. This could be due to various reasons such as cost of living differences; however, it is essential to remember that some of the data took many different assumptions to calculate their starting salary and yearly raise. On the other hand, accounting has a higher NPV than accounting from the other data set in table 4.

**Table 13: The Average MTSU Graduate Ranked by Internal Rate of Return (IRR)**

| Major | Internal Rate of Return |
|---|---|
| Computer Science | 21.39% |
| Nursing | 17.83% |
| Accounting | 16.88% |
| Information Systems | 15.98% |
| Economics | 15.10% |
| Journalism | 15.09% |
| Physics | 14.61% |
| Marketing | 14.46% |
| Mathematics | 14.21% |
| Finance | 13.49% |
| Business Management | 12.82% |
| Criminal Justice | 10.69% |
| Political Science | 9.00% |
| English | 7.97% |
| Communications | 7.94% |
| Biology | 7.89% |
| Art History | 6.78% |
| Music | 6.76% |
| Drama | 6.71% |
| Philosophy | 6.64% |
| History | 6.35% |
| Fine Arts | 5.99% |
| Secondary Teacher Education | 5.82% |
| Psychology | 4.95% |
| Plant Science | 4.49% |
| Animal Science | 4.42% |
| Social Work | 3.60% |
| Special Needs Education | 3.56% |
| Visual and Performing Arts | 3.41% |
| Interdisplinary Studies | 3.27% |
| Elementary Education | 1.73% |
| Anthropology | -12.35% |

Like table 12, table 13 highlights that many majors have a negative return. The discount rate for this comparison was 4.99% since this is the average student loan interest rate (Calonia, 2022). The nine same majors that returned a negative NPV did not meet the required return in this IRR analysis. Also, an anthropology degree from MTSU is the only major in this study that returned a true negative IRR. This could be because of income assumptions, but it is still noteworthy.

## 4.4 Other Comparisons and Analysis (MTSU)

**Table 14: $0 Net Present Value Analysis**

| NPV=0 | |
|---|---|
| Major | Student Debt |
| Computer Science | $ 436,740.77 |
| Accounting | $ 297,128.98 |
| Economics | $ 254,074.90 |
| Nursing | $ 248,833.62 |
| Physics | $ 243,882.00 |
| Information Systems | $ 242,569.66 |
| Marketing | $ 216,429.30 |
| Mathematics | $ 213,776.96 |
| Journalism | $ 203,804.29 |
| Finance | $ 183,278.57 |
| Business Management | $ 161,506.60 |
| Criminal Justice | $ 109,445.99 |
| Political Science | $ 88,000.78 |
| English | $ 65,813.31 |
| Communications | $ 65,576.50 |
| Biology | $ 64,937.66 |
| Art History | $ 46,430.42 |
| Music | $ 45,606.21 |
| Philosophy | $ 45,385.51 |
| Drama | $ 43,830.36 |
| History | $ 39,860.33 |
| Fine Arts | $ 33,820.99 |
| Secondary Teacher Education | $ 31,398.05 |
| Psychology | $ 19,620.34 |
| Plant Science | $ 13,984.39 |
| Animal Science | $ 11,960.43 |
| Special Needs Education | $ 6,436.35 |
| Social Work | $ 6,036.55 |
| Interdisplinary Studies | $ 5,227.88 |
| Visual and Performing Arts | $ 548.25 |
| Elementary Education | $ (11,735.37) |
| Anthropology | $ (133,845.64) |

As previously stated, the $0 NPV analysis gives an overview of the maximum amount of debt someone could take out to receive an NPV of $0. The results from table 14 are predictable outside of Elementary Education and Anthropology. These two majors return a negative number which essentially means that taking on any amount of debt for these degrees is a bad financial decision. In theory, these majors would require a prospective student to get paid to get these degrees which is highly unlikely.

**Table 15: How Savings Rate Affects Retirement Savings**

| Major | 30% Savings, 10% Return | 20% Savings, 10% Return | 10% Savings, 10% Return |
|---|---|---|---|
| Accounting | $ 2,535,833.70 | $ 1,621,035.85 | $ 690,014.04 |
| Animal Science | $ 1,295,070.73 | $ 777,014.42 | $ 287,322.22 |
| Anthropology | $ 822,594.70 | $ 477,689.85 | $ 142,501.47 |
| Art History | $ 1,488,797.17 | $ 916,691.92 | $ 351,124.86 |
| Biology | $ 1,606,048.46 | $ 987,961.59 | $ 376,102.39 |
| Business Management | $ 2,029,790.94 | $ 1,283,873.08 | $ 532,802.93 |
| Communications | $ 1,594,628.07 | $ 982,473.85 | $ 375,549.73 |
| Computer Science | $ 3,199,400.61 | $ 2,005,333.64 | $ 887,604.34 |
| Criminal Justice | $ 1,855,019.27 | $ 1,148,665.41 | $ 459,426.63 |
| Drama | $ 1,543,936.93 | $ 946,433.31 | $ 353,666.59 |
| Economics | $ 2,190,223.61 | $ 1,410,268.82 | $ 591,691.64 |
| Elementary Education | $ 1,429,958.99 | $ 848,968.49 | $ 296,071.81 |
| English | $ 1,602,631.34 | $ 986,824.35 | $ 376,633.58 |
| Finance | $ 2,087,877.28 | $ 1,312,318.84 | $ 553,195.52 |
| Fine Arts | $ 1,410,594.86 | $ 861,929.80 | $ 325,378.75 |
| History | $ 1,447,847.80 | $ 876,750.68 | $ 336,993.08 |
| Information Systems | $ 2,504,227.49 | $ 1,590,416.17 | $ 663,030.81 |
| Interdisplinary Studies | $ 1,495,845.54 | $ 897,167.32 | $ 320,304.60 |
| Journalism | $ 2,417,157.09 | $ 1,530,528.59 | $ 634,520.70 |
| Marketing | $ 2,178,607.61 | $ 1,395,154.12 | $ 574,501.66 |
| Mathematics | $ 2,126,399.11 | $ 1,352,884.78 | $ 559,341.49 |
| Music | $ 1,529,943.28 | $ 931,010.94 | $ 349,283.80 |
| Nursing | $ 2,848,239.27 | $ 1,769,470.74 | $ 744,185.07 |
| Philosophy | $ 1,453,583.03 | $ 881,470.60 | $ 340,417.67 |
| Physics | $ 2,106,020.98 | $ 1,348,184.99 | $ 563,457.92 |
| Plant Science | $ 1,345,845.86 | $ 811,952.78 | $ 296,899.51 |
| Political Science | $ 1,646,019.82 | $ 1,026,437.39 | $ 403,007.88 |
| Psychology | $ 1,390,367.20 | $ 838,355.47 | $ 311,750.08 |
| Secondary Teacher Education | $ 1,601,158.50 | $ 972,817.17 | $ 354,927.55 |
| Social Work | $ 1,438,041.46 | $ 858,835.14 | $ 308,859.36 |
| Special Needs Education | $ 1,540,814.63 | $ 923,044.35 | $ 325,800.20 |
| Visual and Performing Arts | $ 1,273,481.50 | $ 761,647.85 | $ 281,581.61 |

In table 15, two trends show the importance of savings rates for MTSU graduates concerning retirement savings. If an MTSU graduate can save 30% of their income, they are projected to retire with over a million dollars for all majors, excluding Anthropology. On the other hand, if an MTSU graduate only saves 10% of their income, there is not a major that will give them the needed income to become a millionaire. This highlights two important facts about picking a major. The first is that an excellent major cannot overcome poor money habits. The other fact is that having a higher-than-average savings rate and good money habits allow freedom when picking a major.

**Table 16: Payback Period for Different Student Debt Levels (Months) (MTSU)**

| Major | $20,500.00 | $10,000.00 | $30,000.00 | $50,000.00 |
|---|---|---|---|---|
| Accounting | 26 | 13 | 38 | 64 |
| Animal Science | 47 | 23 | 69 | 118 |
| Anthropology | 68 | 33 | 101 | 177 |
| Art History | 41 | 20 | 61 | 104 |
| Biology | 39 | 19 | 58 | 98 |
| Business Management | 31 | 15 | 46 | 77 |
| Communications | 39 | 19 | 58 | 99 |
| Computer Science | 21 | 10 | 31 | 52 |
| Criminal Justice | 34 | 17 | 50 | 85 |
| Drama | 40 | 20 | 59 | 102 |
| Economics | 29 | 14 | 43 | 71 |
| Elementary Education | 43 | 20 | 64 | 113 |
| English | 39 | 19 | 58 | 98 |
| Finance | 31 | 15 | 45 | 76 |
| Fine Arts | 43 | 21 | 64 | 109 |
| History | 43 | 21 | 63 | 107 |
| Information Systems | 26 | 13 | 38 | 65 |
| Interdisplinary Studies | 41 | 20 | 61 | 108 |
| Journalism | 27 | 13 | 39 | 67 |
| Marketing | 29 | 14 | 43 | 72 |
| Mathematics | 30 | 15 | 44 | 74 |
| Music | 41 | 20 | 60 | 103 |
| Nursing | 23 | 11 | 34 | 58 |
| Philosophy | 43 | 21 | 63 | 107 |
| Physics | 30 | 15 | 44 | 74 |
| Plant Science | 45 | 22 | 67 | 115 |
| Political Science | 38 | 19 | 56 | 95 |
| Psychology | 44 | 21 | 65 | 112 |
| Secondary Teacher Education | 39 | 19 | 58 | 100 |
| Social Work | 43 | 21 | 63 | 111 |
| Special Needs Education | 40 | 19 | 60 | 106 |
| Visual and Performing Arts | 47 | 23 | 70 | 121 |

The primary trend from table 16 shows that MTSU students should avoid going into $50,000 of debt for their degree. Although some majors can bail them out of this mistake, over half the majors will take over eight years to pay off in this situation. Delaying all or a significant amount of retirement savings for over eight years is detrimental to compound interest and should be avoided at all costs. On the other hand, all MTSU majors can be paid off in under three years if only $10,000 of student debt is taken out. This is promising for MTSU, given that it is an affordable school.

## 4.5 Results Conclusion

For most of these results, the outcomes were somewhat expected. The best majors for the average college graduate and MTSU graduate were STEM, business, and nursing. On the other hand, the worst ones for both models and comparisons tended to be liberal arts and education majors. It is important to realize that these majors are not bad and are needed for society to function to its fullest potential; however, from a financial perspective, they do not make sense to incur significant debt.

One of the questions I wanted to answer is an MTSU degree worth the same as an average college degree from another school. In my findings, the NPV for the average college graduate was $266,000 and the NPV for an average MTSU student was $122,000. Although this seems like a significant difference, there are reasons for the large gap. The first one being is that MTSU does not have an engineering school. In almost all the tables and comparisons, engineering proved to be one of the most valuable majors by a significant margin which would skew the data significantly. The other reason for the large gap is that MTSU's anthropology degree seems to be the only considerable outlier in all the results. To have actual comparable results, all engineering degrees need to be excluded from this comparison since MTSU does not offer engineering degrees. Also, anthropology must be excluded from both calculations since it is a statistical anomaly. After these adjustments, the NPV for the average college graduate is $197,667, and the average MTSU graduate is $132,036. This is still a relatively large gap as the NPV for MTSU graduates is roughly 33% behind the average; however, many different assumptions had to be made to get the data and model to make an equal comparison which should be considered when analyzing these results.

Given that this was not the first project calculating the NPV of a college degree, I wanted to compare my results to previous studies to see how my results compare to others. For the most part, my results were relatively in line with previous studies. In 2016, the Social Security Administration conducted a study like mine and found that the NPV for a college degree was $260,000 for a male and $180,000 for a female (*Education and lifetime earnings*, 2016). Another study by Kent Hill, an economics professor at Arizona State, found the NPV of a college degree to be $482,400 for men and $341,900 for women (Hill, 2018, p. 6). These results are significantly larger than mine and the other study, but this study also accounts for a 43-year working career, whereas my model assumes only 30. This significant difference explains the gap, as NPV will only continue to increase as more positive cash flows are received.

Hill's study looked specifically at different majors' NPV and found similar results. Although the numbers in his study are larger for reasons discussed previously, the rankings are extremely similar. For starters, engineering, business, and other STEM degrees were at the top of his rankings. Likewise, education and liberal arts majors were at the bottom of his list (Hill, 2018, p. 10). Below is a comparison of rankings for majors included in both of our studies. Majors in parenthesis denote a similar major using a different name.

**Table 17: Majors Ranked by NPV**

| Majors Ranked by NPV | |
|---|---|
| Hill's Results | My Results |
| *Economics* | *Electrical Engineering* |
| *Computer Science* | *Mechanical Engineering* |
| *Finance* | *Civil Engineering* |
| *Electrical Engineering* | *Computer Science* |
| *Mechanial Enginnering* | *Accounting* |
| *Mathematics* | *Nursing* |
| *Civil Engineering* | *Information Systems* |
| *Accounting* | *Economics* |
| *Marketing* | *Marketing* |
| *Political Science* | *Journalism* |
| *Information Systems* | *Mathematics* |
| *Business Management* | *Finance* |
| *Nursing* | *Business Management* |
| *Communication* | *Criminal Justice* |
| *Journalism* | *Political Science* |
| *History* | *English* |
| *Chemistry* | *Communications* |
| *Biology* | *Biology* |
| *Philosophy* | *Art History* |
| *English* | *Music* |
| *Psychology* | *Philosophy* |
| *Criminal Justice* | *History* |
| *Forestry (Plant Science)* | *Fine Arts* |
| *Fine Arts* | *Psychology* |
| *Music* | *Plant Science (Forestry)* |
| *General Education (Interdisplinary Studies)* | *Interdisplinary Studies (Geneal Education)* |
| *Elementary Education* | *Elementary Education* |

The results from my model were unsurprising and confirming of my expectations. It has been shown by previous research and my model that STEM and business majors are the best majors from a financial standpoint. For prospective students who do not view college as an investment and want to major in something that they enjoy regardless of future earning potential, they should try to avoid student debt and get their savings rate as high as possible. Contrastingly, prospective students who view college as an investment and want to maximize their earnings potential can incur student loan debt and have a

lower savings rate; however, it would be better for their financial future to limit student debt still as much as possible and try to have a high savings rate.

## 5. Conclusion

This study aimed to create a Microsoft Excel financial model to determine the value of different college majors while also looking specifically at MTSU. This was accomplished using income data, a student loan calculator, many different assumptions, and various valuation techniques such as net present value, internal rate of return, and retirement savings. I also showed the importance of staying out of debt and how much debt is acceptable for a given major.

After analyzing the results, my results conform with previous findings. The majors that have the best financial upside are majors within the categories of STEM, business, and nursing. On the other hand, the majors that bring the worst financial value are education, social work, general education, and liberal arts. If student debt is inevitable in a prospective college student's circumstance, these results should be considered when deciding what to major in. While more goes into picking a major, the financial aspect becomes more critical when debt is incurred.

As previously stated, it is important to remember that majors such as liberal arts and education are critical for society to function. Although the financial aspect is important and should be considered, someone's passion should not be deterred by predicting their future financial well-being. Instead, prospective students looking to go into these fields should try to make school more affordable and avoid debt. This can be

done through grants, scholarships, or self-funding, which are all viable options for pursuing something they are passionate about.

While this study provides valuable information for students preparing to make their college decision, further research is possible. For starters, one of the models created was explicitly made for MTSU. If the income data was changed, the model could be easily replicated for any university. Next, using data tailored to this study would make the findings more accurate. In this model, assumptions were needed regarding starting salary and yearly raises which could be alleviated with income data that asked such questions. Further research could also include more majors so that readers could find the results for various majors. Lastly, the model created is unique and focused on variables that made the greatest change; however, the impact that some variables have now may not be the same in the future and vice versa. It is difficult to predict the future policies and resources students may have given that this is an issue at the forefront of politics. As the student loan crisis continues to develop, students' choice of major will only continue to become more important. Obtaining higher education is the first step to creating or furthering one's career and making an informed decision is critical to building wealth.

# 6. References


50/30/20 budget calculator. (2022, January 28). NerdWallet. https://www.nerdwallet.com/article/finance/nerdwallet-budget-calculator.

*Average wage index (AWI).* (2021). Social Security Administration. https://www.ssa.gov/oact/cola/awidevelop.html

Calonia, J. (2022, October 17). Student loan interest rates in October 2022. Bankrate. https://www.bankrate.com/loans/student-loans/current-interest-rates/#:~:text=Federal%20student%20loans%20for%20undergraduates,loans%20or%20PLUS%20loans%2C%20respectively.

Carnevale, A., Cheah, B., & Hanson, A. (2015). The economic value of college majors. *CEW Georgetown*. https://cew.georgetown.edu/cew-reports/valueofcollegemajors/.

*MTSU college scorecard*. (2022. September 14). College Scorecard. https://collegescorecard.ed.gov/school/fields/?220978-Middle-Tennessee-State-University.

Cooper, P. (2021, October 19). Is college worth it? A comprehensive return on investment analysis. *FREOPP*. https://freopp.org/is-college-worth-it-a-comprehensive-return-on-investment-analysis-1b2ad17f84c8.

*Education and Lifetime Earnings*. (2015, November). Social Security Administration. https://www.ssa.gov/policy/docs/research-summaries/education-earnings.html.

*Fact sheet: President Biden announces student loan relief for borrowers who need it most.* (2022, August 24). The White House. https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/24/fact-sheet-president-biden-announces-student-loan-relief-for-borrowers-who-need-it-most/.

Fernando, J. (2022, September 5). "Net present value (NPV): What it means and steps to calculate it." *Investopedia*. https://www.investopedia.com/terms/n/npv.asp.

Fernando, J. (2022, August 25). "What is internal rate of return (IRR)?" *Investopedia*. https://www.investopedia.com/terms/i/irr.asp#:~:text=The%20internal%20rate%20of%20return,same%20formula%20as%20NPV%20does.

Fullwiler, S., Kelton, S., Ruetschlin, C., & Steinbaum, M. (2018, February). The macroeconomic effects of student debt cancellation. Levy Economics Institute. https://www.levyinstitute.org/pubs/rpr_2_6.

Hanson, M. (2022, July 10). *Student loan debt statistics*. Education Data Initiative. https://educationdata.org/student-loan-debt-statistics

Hanson, M. (2022, April 23). *How people pay for college [2022]: financing statistics*. Education Data Initiative. https://educationdata.org/how-do-people-pay-for-college.

Hanson, M. (2021, November 19). *Is college worth it? Return on investment analysis of college degree*. Education Data Initiative. https://educationdata.org/college-degree-roi#:~:text=The%20lifetime%20median%20return%20on,full%2Dtime%20for%2015%20years.

Hill, K. (2018, October). The value of a college education and the burden of student loan repayment. Arizona State University. https://ccpr.wpcarey.asu.edu/sites/default/files/valuecolleduc10-18.pdf.

*Historical inflation rates: 1914-2022: U.S. inflation calculator*. (2022, October 13). U.S. Inflation Calculator. https://www.usinflationcalculator.com/inflation/historical-inflation-rates/.

*How long before canceled student debt would return?* (2022, September 1). Committee for a Responsible Federal Budget. https://www.crfb.org/blogs/how-long-cancelled-student-debt-would-return#:~:text=We%20estimate%20that%20if%20all,half%20years%20%E2%80%93%20in%2020281.

Johnson, D. M. (2019). What will it take to solve the student loan crisis? *Harvard Business Review Digital Articles*, *2019*, 2–5. https://eds-a-ebscohost-com.ezproxy.mtsu.edu/eds/pdfviewer/pdfviewer?vid=2&sid=ebc89a6a-28ce-4fd9-b2d3-065c1b7047e7%40sdc-v-sessmgr03

Kagan, J. (2022, September 26). *Payback period explained, with the formula and how to calculate it.* Investopedia. https://www.investopedia.com/terms/p/paybackperiod.asp.

*Measuring the value of education: career outlook.* (2018, April). U.S. Bureau of Labor Statistics. https://www.bls.gov/careeroutlook/2018/data-on-display/education-pays.htm.

*Median household income by state 2022*. (2022). World Population Review. https://worldpopulationreview.com/state-rankings/median-household-income-by-state.

Mitchell, M., Leachman, M., & Saenz, M. (2019, October 24). State higher education funding cuts have pushed costs to students, worsened inequality. *Center on Budget and Policy Priorities*. https://www.cbpp.org/sites/default/files/atoms/files/10-24-19sfp.pdf.

Plumer, B. (2013, May 20). Analysis | only 27 percent of college grads have a job related to their major. *the Washington Post.* https://www.washingtonpost.com/news/wonk/wp/2013/05/20/only-27-percent-of-college-grads-have-a-job-related-to-their-major/.

*The standard repayment plan is the basic repayment plan for loans from the William D. Ford federal direct loan (direct loan) program and federal family education loan (FFEL) program.* (n.d.). Federal Student Aid. Retrieved October 7, 2022, from https://studentaid.gov/manage-loans/repayment/plans/standard.

Thune, K. (2022, May 27). *Average return of the stock market: S&P 500, Dow Jones.* Seeking Alpha. https://seekingalpha.com/article/4502739-average-stock-market-return.

*The value of a broad-based education.* (n.d.). Middle Tennessee State University. Retrieved October 6, 2022, from https://mtsu.edu/ready-to-work/#:~:text=The%20Value%20of%20a%20Broad,That%20we%20are%20the%20No.