

# **A Cost-Benefit Analysis of Accounting Undergraduate Education**

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## **ABSTRACT**

A post-secondary education is one of the most important and coveted credentials for the working professional. In the modern era, an undergraduate degree has become an invaluable certification that allows for countless opportunities in both public and private industry. Barring all limitations, the ambitious and rational individual would undoubtedly seek such a level of education.

Though its perceived benefits are substantial and real, the cost of attaining an undergraduate education is increasing now more than ever. One should never underestimate the value of a college education, however at the same time neither should you underestimate its price. College tuition costs are rising at twice the rate of inflation. Few students can afford to pay for college without some form of education financing. In 2007-2008, among graduating 4-year undergraduate students who applied for federal student aid, 86.3% borrowed to pay for their education (National Center for Educational Statistics).

Could increased student debts, interest rates, and loss of government financial aid support threaten the value of a college education? This study will conduct a cost-benefit analysis on the projected total costs of an Accounting undergraduate education assuming historical market trends in both costs and future earnings power.

Keywords: cost-benefit, undergraduate education, accounting, debt burden, economic burden

## **INTRODUCTION**

In the age of information, the knowledge assimilated by individuals is a fundamental determinant of one's standard of living. Presumably, the more intellectual capital one acquires through their work experiences and educational training, the greater their ability to perform labor and thus produce greater economic value. Heightening one's competence to provide this value for their employer should result in increased salaries substantiated by their greater marginal production. With elevated compensation levels being the primary incentive for most, there exists an inherent occupational shift in career aspirations from manufacturing and physical labor to more office-work requiring enlarged quantities of intellectual capital and essentially a college degree.

In October 2008, the number of 18 – 24 year olds attending college in the United States hit an all-time high. Just under 11.5 million students, or 39.6% of all young adults between ages of 18 and 24, were enrolled in either a two- or four-year educational institution (Fry). Unfortunately for today's college students, coupled with increased enrollments are increased college tuitions and fees. On average, tuition tends to increase at a rate of 8% per year, which is twice the rate of general inflation. Based on this historical trend, for a baby born today, tuitions will rise three times the current rate by the time the baby matriculates into college (FinAid). The ever-increasing expenses for an undergraduate degree force students to undertake an increasing amount of debt to support their academic journey. These liabilities accrued during one's education must then be paid off along with interest after their graduation and entrance into the workforce. This prospectively compromises the improvement in their standard of living, which remains the primary incentive to attend college.

Considering the aforementioned trends in college tuitions surpassing the general rate of inflation, this study seeks to understand if the cost of undergraduate Accounting degree is a worthwhile investment. Incorporating historical, current, and projected trends in educational financing, inflation indexes, and average debt burdens, this study examines the true economic value of an undergraduate degree in Accounting.

## **INFLATIONARY ASSUMPTION**

In order to construct the analysis with limited arbitrary information, costs and earnings are assumed to increase in the future by the historical inflationary rate except where noted. This is similar to the point in time method used by the United States Census Bureau to construct its synthetic work-life earnings estimates to analyze the effect educational attainment has on the earnings patterns of individuals (Kominski and Julian).

Using this inflationary assumption makes numerous present value calculations unnecessary. If the inflationary rate is used to project increases in costs and earnings and then also used as the appropriate discount rate, the result would be that the present value of the costs and earnings would simply be an accumulation of these factors over the appropriate number of years at today's dollars.

## **COST ASSUMPTIONS**

- ❖ Interest rates on subsidized and unsubsidized loans are calculated at their current levels for educational financing. Private student loans for educational debt is assumed to be equal to the unsubsidized rate of 6.8% APR.
- ❖ Educational debt is paid off in a period of fifteen years with equal monthly payments for 180 months.
- ❖ Students take out needed loans at the beginning of each academic year to finance entire year's expense.
- ❖ An additional 22 credits is required to be eligible to sit for the Wisconsin CPA exam, and thus additional coursework is required beyond the standard 128 credits required for graduation (extra terms).
- ❖ Extra terms required for Wisconsin CPA eligible students are paid for through the use of either student or family existing funds thus no interest costs are accrued on these amounts.
- ❖ Foregone income-producing abilities amounts to \$30,250 per annum. This is based on the Robert Half: Finance and Accounting's 2012 Salary Guide for a non-college degree AR/ AP clerk position in a mid-sized company.

## **COST ANALYSIS**

As can be observed in Table 1, the only expense variable that is expected to increase over the rate of inflation is the tuition expense. Research has suggested that tuition rises at a much greater rate, approximately 8% (FinAid). Thus this study will include an increase to tuition expense of 5% each year, which represents the expected increase beyond the historical inflationary rate of approximately 3% (InflationData.com). With all other expenses being netted to present value terms using the inflation rate as the discount rate, current costs can be entered into the model without any further manipulation.

Costs can be categorized as both explicit and implicit. Explicit costs are the expenses, which are merely "out of pocket" and what would be tracked via accounting principles. Implicit costs refer to the value of those opportunities forgone by making a decision. This incorporates the idea that college is mutually exclusive from working full-time between ages 18 and 22. In attempt to establish the true economic burden of an undergraduate degree in Accounting at St. Norbert College, this study must take both types of expenses into account.

Table 1: Undergraduate Education Costs -Current Year Information provided by St. Norbert College Finance Department

Cost Type	Freshman	Sophomore	Junior	Senior	Total
Tuition	\$28,935	\$30,382	\$31,901	\$33,496	\$124,714
Technology Fee	210	210	210	210	840
Activity Fee	150	150	150	150	600
Student Health Fee	100	100	100	100	400
Degree Application Fee (Senior)				100	100
Room	4,509	4,509	4,509	4,509	18,036
Food (Fresh/Soph) - Platinum	3,816	3,816			7,632
Food (Junior) - Gold			2,563		2,563
Food (Senior) - Silver				2,563	2,563
Textbooks	<u>900</u>	<u>900</u>	<u>900</u>	<u>900</u>	<u>3,600</u>
Explicit Costs	\$38,620	\$40,067	\$40,333	\$42,028	\$161,048
Implicit Costs	\$30,250	\$30,250	\$30,250	\$30,250	\$121,000
<b>Total Cost Per Year</b>	<b><u>\$68,870</u></b>	<b><u>\$70,317</u></b>	<b><u>\$70,583</u></b>	<b><u>\$72,278</u></b>	<b><u>\$282,048</u></b>

Table 1 indicates the projected gross costs for an undergraduate education. However, most students receive financial aid which offsets some of the above explicit costs. Therefore, the components of a typical financial aid package were obtained from the St. Norbert College Office of Financial Aid and are presented in Table 2 below.

Table 2: St. Norbert College Financial Aid Breakdown

Gift Aid	\$15,465	65%
Employment	1,189	5%
Subsidized Loans	3,926	30%
Unsubsidized Loans	3,212	
<b>Average Award</b>	<b>\$23,792</b>	

As with any expensive undertaking, financing is generally needed. In 2007-2008, among graduating 4-year undergraduate students who applied for federal student aid, 86.3% borrowed to pay for their education. (National Center for Educational Statistics). There are three fundamental forms of educational financing. These include subsidized loans, unsubsidized loans and private student loans. Subsidized and unsubsidized loans are guaranteed by the government and considered part of a student’s financial aid package. While private student loans are separate from a student’s financial aid package and are obtained through private lenders. Subsidized loans are interest deferred until graduation while unsubsidized loans and private student loans accrue interest once disbursed to the student. Conservatively this study assumes that any amounts needed beyond the financial aid package will be financed through private student loans. Referring to Table 1 for gross explicit costs and Table 2 for the typical financial aid package, the loan amounts required can be calculated and are presented below in Table 3.

Table 3: Calculation of Debt Burden

	Freshman	Sophomore	Junior	Senior	Total
Explicit Costs (Table 1)	\$38,620	\$40,067	\$40,333	\$42,028	\$161,048
Financial Aid (Table 2)	<u>23,792</u>	<u>23,792</u>	<u>23,792</u>	<u>23,792</u>	<u>95,168</u>
Additional Amount Needed - Private Student Loans	14,828	16,275	16,541	18,236	65,880
Unsubsidized Loans (Table 2)	<u>3,212</u>	<u>3,212</u>	<u>3,212</u>	<u>3,212</u>	<u>12,848</u>
Total Unsubsidized and Private Loans	18,040	19,487	19,753	21,448	78,728
Total Subsidized Loans (Table 2)	<u>3,926</u>	<u>3,926</u>	<u>3,926</u>	<u>3,926</u>	<u>15,704</u>
Total Debt Burden	<u>\$21,966</u>	<u>\$23,413</u>	<u>\$23,679</u>	<u>\$25,374</u>	<u>\$94,432</u>

Realizing that unsubsidized and private student loans accrue interest once disbursed, this portion of the debt balance will amount to a value greater than what is received when in school. Again, since the subsidized loans are interest deferred, they will not have this same effect.

Table 4: Interest Accrued on Unsubsidized and Private Student Loans

	Principal Borrowed (Table 3)	Interest Accrued	Total Principal and Interest Outstanding at Year End
Freshman	\$18,040	\$1,227	\$19,267
Sophomore	19,487	2,635	41,389
Junior	19,753	4,158	65,300
Senior	<u>21,448</u>	<u>5,899</u>	\$92,646
Totals	<u>\$78,728</u>	<u>\$13,919</u>	

In order to calculate the total explicit expenses of an undergraduate education, the present value of the interest to be paid on the educational debt after college also needs to be considered. Subsidized loans incur interest at a rate almost equal to that of the inflation rate, 3.4% against 3.43%, respectively (InflationData.com). This debt will have an immaterial amount of present value interest expense because of the near equality. Unlike the subsidized debt, unsubsidized and private students loans possess a much greater interest rate and will therefore create a present value interest expense to be considered in cost-benefit calculations. This study uses an interest rate of 6.8% for the unsubsidized and private student loans and a discount rate of 3.4%. The result of this calculation is presented below in Table 5 as "Interest Paid After College (present value)".

Table 5: Net Explicit Costs Calculation

Subsidized Loans	\$15,704
Unsubsidized and Private Student Loans	78,728
Interest Accrued During College	13,919
Interest Paid After College (present value)	13,703
Extra terms required to be CPA eligible	<u>7,232</u>
Total Explicit Undergraduate Education Costs After Financial Aid (Net Explicit Costs)	<u>\$129,286</u>

After considering all educational debt variables, the net explicit costs amount to \$129,286 and the implicit costs amount to \$121,000 (see Table 1) over the same four years. In total, this yields an economic burden of \$250,286 on the typical undergraduate Accounting student at St. Norbert College.

**Benefit Assumptions:**

- ❖ Salaries are based on Robert Half: Finance and Accounting’s 2012 Salary Guide. For a college graduate, the minimum amounts in the ranges for mid-size public accounting firms were used. For a non-college graduate, the minimum amounts in the ranges for AR/AP positions in midsized companies were used.
- ❖ Only base salaries are considered for the benefit analysis
- ❖ A college graduate will earn their Certified Public Accountant certification by year 5 of their career.
- ❖ Periods between promotions for a college graduate and Certified Public Accountant were made to allow the person to be eligible for partner status by age 40.
- ❖ The period between a promotion for a non-college educated accountant were made to allow the person to achieve manager status after age 35.

**Benefit Analysis:**

As can be seen in Table 6 below, salary raises occur only when the accountant accepts a promotion. This is the result of our assumption that annual increases will approximate the average inflation rate. If the salary increases were discounted with the historic inflation rate percentage, the promotion increases would exclusively determine salary increases in present value terms.

Table 6: Career Salaries

College Education – Public Accounting				Non-College Education – AR/AP Clerk			
<u>Position</u>	<u>Number of Years in Position</u>	<u>Annual Salary</u>	<u>Total</u>	<u>Position</u>	<u>Number of Years in Position</u>	<u>Annual Salary</u>	<u>Total</u>
Staff	4	\$45,200	\$180,800	AR/AP Clerk	18	\$30,250	\$544,500
Senior	6	64,250	385,500	AR/AP Manager	30	44,500	<u>1,335,000</u>
Manager	8	81,750	654,000				
Partner	26	98,500	<u>2,561,000</u>				
Total Career Salary			<u>\$3,781,300</u>	Total Career Salary			<u>\$1,879,500</u>

As seen, the promotion from staff accountant to senior accountant reflects recognition of experience and CPA certification. Within the same time period, a person who has not attended a college or university did not receive any position promotions or salary base increases.

Assuming a career ending at age 65, the average base salary for a college educated Certified Public Accountant is \$85,939 compared to \$39,156 for a non-college educated accountant. The difference is attributed to the disparity of promotion rates and the total base salaries. Public accountants go through an average of three promotions to obtain the top job for their position and earned approximately \$3,781,300 in total, contrasted to one job promotion and \$1,879,500 total earnings for non-college graduate accountants.

## **Conclusion**

Using the net present value method as the primary decision-making tool, the financially advantageous option is to pursue an undergraduate degree in Accounting. Although the college degree costs \$129,826 in today's dollars as well as forgoes \$121,000 of income, a college degree's net benefit exceeds the forecasted benefits of a non-college graduate working in the Accounting field. The net present value of a college degree with an Accounting major is \$3,531,014 [ $\$3,781,300$  (benefits) minus the  $\$250,286$  (costs)]. On the contrary, a non-college graduate working in the same industry will yield only \$1,879,500 in present value dollars. Based on this study's assumptions and calculations, a college graduate with an accounting major will earn approximately twice the income of their non-college degree counterparts. With such a difference in projected monetary benefits, an undergraduate degree in Accounting is a worthwhile investment.

## **Limitations**

There exist variables and circumstances that are unaccounted for in this study including demographic factors such as gender and heritage. Additionally, many assumptions are made regarding similar employability between college graduates and non-college graduates in the accounting profession. However, the two educational backgrounds will most likely possess vastly different job prospects in the industry. For example, those with college majors in Accounting offer the abilities to perform more specialized and advanced services in addition to the ability to perform the same work as non-college graduates. Therefore, a professional with an Accounting major is more apt to be hired over a non-college graduate in the industry.

Other circumstances not considered in the study include possible changes to the financial regulatory environment. With a potential convergence of U.S. GAAP and IFRS, the accounting framework could change shifting the need for even more college-educated professionals to decipher the new business environment. There wouldn't necessarily be a decline in non-college graduate accounting positions, however the majority of future growth may be allocated towards those with higher technical backgrounds, i.e. college graduates. This would suggest improved professional opportunities for those with Accounting majors.



Lastly, the assumptions include a stable economic climate. This includes stable interest rates, salary raises and increases in educational costs (besides tuition) equal to the inflation rate, as well as full employment throughout the measured time period. The estimates are projected averages of rates that may be seen over this time period. They are based on historical and current economic information.

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