# **Student Loans**

# **Chapter Outline**

Introduction: Education Is an Investment Financing a College Education Expenses Associated with College Federal and Other Loans **Repaying Student Loans** Non-Loan Sources of Funding Calculating the Bottom Line Case Study Part 1: Meet James Putting a Value on a College Education Choosing a Career Path Financial Consequences of Your Education Choices Case Study Part 2: James Calculates His Education Costs Post-Graduate Degrees Costs of an Advanced Degree Sources of Funding Calculating the Bottom Line Case Study Part 3: James Considers His Alternatives Working with the Three Questions Case Study Part 4: James, Five Years Later Chapter Summary

# **Chapter Learning Objectives**

After reading this chapter, students will be able to:

- Assess the cost of their education and their likely post-graduation debt.
- Compare the costs and likely salaries of various career choices.
- Investigate alternatives for funding their education.
- Evaluate the risks associated with their education choices.

# INTRODUCTION: EDUCATION IS AN INVESTMENT

Your education is one of the biggest investments you will make in your life. It will affect the type of job you can obtain and the income that job generates. You can think of income as the payoff of your educational investment. However, every investment has a cost associated with it, and a college education is no exception. In this chapter, we look at the costs and benefits associated with attending college, the options available for meeting those costs, and considerations of the possible financial benefits that you may reap from your education.

If you are reading this, you are probably in college. What do you know about the finances involved? Do you know what your education will cost, or is costing? Who is paying for it? How will your degree financially affect your future, both positively as you seek employment, and negatively as you repay any college loans that you may have? Most college students graduate with student loan debt. If you have student loans, do you know how much yours will be? How do you expect to repay your loans? Now is the time to find out.

The cost of higher education has increased faster than the rate of inflation or wage growth, and student loans can reach sizeable amounts. As such, this sort of expense is one that you need to plan for. Results from the 2015 National Financial Capability Study show that few young people have done the calculations that would allow them to see what monthly impact their student loan repayment will have on their future finances.<sup>1</sup> Ignorance is not bliss. More than 50% of recent college graduates with student loans state they would have done something different if they could turn back the clock. Moreover, the delinquency rate on student loans has kept going up, as shown in Figure 6.1. This indicates that students have taken out more in loans than they can afford.



**Figure 6.1: Student Loan Delinquency Rate** 

The horizontal axis lists the percent of student loans delinquent in each quarter.

Source: New York Fed (2017). Quarterly Report on Household Debt and Credit, February 2017.

Accessed at https://www.newyorkfed.org/microeconomics/hhdc.

<sup>&</sup>lt;sup>1</sup> See Lusardi, de Bassa Scheresberg and Oggero (2016), Student Loan Debt in the US: An Analysis of the 2015 NFCS Data." GFLEC Policy Brief, November 2016.

The College Board, the nonprofit institution that administers the SAT and Advanced Placement exams, reports that for an in-state public college for the 2016–2017 academic year, a "moderate" budget for one year of tuition is, on average, \$24,610. A moderate budget at a private college is about twice that amount, on average \$49,320. However, it is not necessarily the case that someone at a private college will pay more for their education because **financial aid packages**, offering combinations of scholarships, grants, and loans, vary from school to school and from student to student. College students may use loans to finance only part of the cost; in fact, the average annual loan is approximately \$6,500, substantially less than the cost of college. The average debt per graduate of a four-year institution is \$17,000.<sup>2</sup>

The decision to go to college is a big one, for reasons both personal and financial. Although it is probably impossible to put a monetary value on your personal reasons for wanting a college education, it is certainly useful to look at the financial implications. How will college affect your present financial situation? In the short run, you will have less money because you can't work as much and college costs quite a bit. However, you must also consider how the decision to go to college will affect your future finances. In the long run, your education may result in a higher paying job. A Pew Foundation study using Census data shows a widening gap between median salaries of college graduates and those without college degrees for adults ages 25 to 32. In 2013, this gap was \$17,500 per year in wages (see Figure 6.2). Over a lifetime, this difference can result in a large amount, which can more than offset the payments on an average student loan. Of course, this number may be different from person to person, as salaries vary widely across different kinds of jobs. As such, your choice of major, which affects your career

<sup>&</sup>lt;sup>2</sup> "Cumulative Debt of Bachelor's Degree Recipients at Four-Year Institutions over Time." College Board, Annual Survey of Colleges, 2001 to 2016; calculations by the authors. https://trends.collegeboard.org/student-aid/figures-tables/cumulative-debt-bachelor-degree-recipients-four-year-institutions-over-time.

opportunities, is just as important as your decision to go to college.

# Figure 6.2: Median Annual Earnings Differences between College Graduates and those without College Degrees



Source: Pew Research Center tabulations of the 2013, 1995, 1986, 1979, and 1965 March Current Population Survey (CPS) IPUMS. Accessed at http://www.pewresearch.org/facttank/2014/02/11/6-key-findings-about-going-to-college/.

There are risks associated with both getting and foregoing higher education. For most people going to college means taking on debt, and there is always the risk that it will be difficult to repay that debt. By not going to college, you risk limiting your employment opportunities because many employers require a college degree. You also risk foregoing higher wages and entry into fields with lower unemployment rates. Postponing college education can be a good move or a bad one, depending on what you do with your time in the interim. Completing a bachelor's degree can be very difficult for older students who have taken on the responsibilities of work and family. On the other hand, money earned during the period before entering college can be helpful in financing your education.

In this chapter, we will explore the costs of higher education, the ways to pay for it, the value of a degree, and the impact of its price on your present and future finances.

# FINANCING A COLLEGE EDUCATION

About 30 percent of college students in 2012 graduated with no debt, according to College Board data.<sup>3</sup> There are three ways to avoid taking on a loan: family assistance, scholarships and grants, and frugality.

Some families have the means to pay for their child's education outright; some have saved for years, for example by giving up desirable purchases such as vacations and expensive cars, to fund a college savings account; others are willing to take on loans to cover education costs so their child doesn't have to take on debt. If you are benefitting from a family that is enabling you to go to college without taking on any student loans, possibly without needing a part-time job, and with the knowledge that you will graduate free of debt, thank your parents (or grandparents) frequently, and focus on your coursework. That is how you can repay your family.

Scholarships and grants can fund a large amount of college costs. This is "gift aid," meaning it does not have to be paid back. Scholarships are received based on merit: usually that means a good to great academic record. The grades that you get in high school and college can have a big financial impact on your college costs. Academic scholarships can cover a small part of your costs—or they can cover the whole thing. Grants are need based, and depend on your family's financial situation. For most students, financial aid eligibility is determined based on

<sup>&</sup>lt;sup>3</sup> Cumulative Debt of Bachelor's Degree Recipients by Sector over Time. NCES, National Postsecondary Student Aid Study, 2004, 2008, and 2012. https://trends.collegeboard.org/student-aid/figures-tables/cumulative-debt-bachelors-recipients-sector-time.

information that the student provides each year on the **Free Application for Federal Student Aid (FAFSA)** form. When a college offers you a financial aid package, it is based on estimates of your needs and expected sources of funding. Applying to schools that may offer good financial aid packages is a strategy that even less-than-stellar students can use.

Finally, frugality is certainly an option for avoiding loans. If your college estimates that you need \$24,000 a year to attend, half of that might be room and board. If living at home is an option because the college is close by, or less-expensive off-campus accommodations are available, you could avoid such costs. If you can also earn \$5,000 in the summer, your remaining needs would be \$7,000 per year. Perhaps by working for a year before starting school you could reduce this need substantially, and earn the remainder with a part time job during the school semester. In other words, it is possible to pay your way through college, and many people do it. Taking advanced placement (AP) courses in high school is another cost-saving measure. Entering college with AP credits can reduce the number of courses you need to graduate, thus saving you the cost of those college-level courses.

For most people, though, higher education is paid for by a combination of these three strategies plus some kind of student loan. When you are admitted to college and receive your financial aid package, you can begin to calculate the cost of your education at each institution to which you are accepted, and consider the ways that you will cover those costs.

#### **Expenses Associated with College**

There are many expenses associated with college beyond the cost of tuition. Living expenses, books, and transportation are all expenses that factor into the total cost. The College Board publishes average estimates of expenditures for three types of institutions: private, public with

7

in-state tuition, and public with out-of-state tuition. Their findings are summarized in Table 6.1.

Budget item	Public, in state	Public, out of state	Private
Tuition and fees	\$9,650	\$24,930	\$33,480
Housing and meals	\$10,440	\$10,440	\$11,890
Books and supplies	\$1,250	\$1,250	\$1,230
Personal and	\$3,270	\$3,270	\$2,720
transportation			

 Table 6.1: Average Annual Costs by College Type, 2016–2017

Source: The College Board

As we saw in Chapter 3, budgets are a tool to help you manage your money and make decisions. Table 6.1 shows that you might save as much as \$15,000 per year by choosing a public university in your state of residence rather than moving out of state. Housing and meal budgets for a given college are based on what they charge for dormitory rooms and meal plans. In some areas, you can save considerably on this expense by moving off campus and making your own meals (or at least some of them), but in more expensive areas campus housing can be the best deal.

# **Federal and Other Loans**

The federal government sponsors the majority of education loans. Some of these are **subsidized loans**, meaning that the government pays the interest on the loan until you are out of college. On

**unsubsidized loans**, however, interest accrues while you are in school and will be added to the principal you owe upon graduation. As of this writing, direct federal loans charge 3.76% for undergraduate studies and 5.31% for graduate studies. No credit rating is required to receive these loans. If you recall the rates described for credit cards and other unsecured loans in Chapter 5, you can see this is a very good deal for the borrower. Subsidized loans are a particularly good deal because the implied interest rate is even lower than the stated interest rate, as illustrated in Do the Math 6.1.

#### [Insert Do the Math 6.1: Implied Interest Rate on Subsidized Loans]

In addition to these loans, there are other classes of government-sponsored loans, such as Federal Perkins loans for low-income students at 5% and Direct PLUS (Parent Loan for Undergraduate Students) loans to parents of undergraduate students at 6.31%; graduate students may also be eligible to borrow under this program.

If a college you are applying to participates in the Federal Student Aid (FSA) programs, your financial aid package is likely to include FSA funds. These programs, described in Table 6.2, are administered by Federal Student Aid and provide over \$150 billion a year to students attending post-secondary schools.

**Table 6.2: Types of Federal Student Aid** 

Type of Aid	Who is Eligible	Repayment
Federal Pell Grants	Available to undergraduate students;	Do not have to be repaid
	graduate students in a teaching	
	credential program may also qualify	
Subsidized and	Available to both undergraduate and	Must be repaid

Unsubsidized Federal	graduate students (first-year	
Stafford Loans	undergraduates are eligible for loans up	
(Provided through the	to \$5,500; amounts increase for	
Federal Direct Loan	subsequent years of study, with higher	
Program)	amounts for graduate students)	
Federal PLUS Loans*	Unsubsidized loans made to parents of	Must be repaid
	undergraduate students	
Graduate and	Graduate and professional students	Must be repaid
Professional Student	effective with loans originated on or	
PLUS Loan (Grad	after July 1, 2006	
PLUS)		
Campus-Based Progra	ams (administered by participating school	s)
Campus-Based Progra Federal Supplemental	ams (administered by participating school Undergraduates only; awards range	s) Do not have to be repaid
Campus-Based Progra Federal Supplemental Educational	ams (administered by participating school Undergraduates only; awards range from \$100-\$4,000	s) Do not have to be repaid
Campus-Based Progra Federal Supplemental Educational Opportunity Grants	ams (administered by participating school Undergraduates only; awards range from \$100-\$4,000	s) Do not have to be repaid
Campus-Based Progra Federal Supplemental Educational Opportunity Grants Federal Work-Study	ams (administered by participating school Undergraduates only; awards range from \$100-\$4,000 Provides jobs to undergraduate and	s) Do not have to be repaid Do not have to be repaid
Campus-Based Progra Federal Supplemental Educational Opportunity Grants Federal Work-Study	ams (administered by participating school Undergraduates only; awards range from \$100-\$4,000 Provides jobs to undergraduate and graduate students, allowing them to	s) Do not have to be repaid Do not have to be repaid
Campus-Based Progra Federal Supplemental Educational Opportunity Grants Federal Work-Study	ams (administered by participating school Undergraduates only; awards range from \$100-\$4,000 Provides jobs to undergraduate and graduate students, allowing them to earn money to pay education expenses	s) Do not have to be repaid Do not have to be repaid
Campus-Based Progra Federal Supplemental Educational Opportunity Grants Federal Work-Study	ams (administered by participating school Undergraduates only; awards range from \$100-\$4,000 Provides jobs to undergraduate and graduate students, allowing them to earn money to pay education expenses	s) Do not have to be repaid Do not have to be repaid
Campus-Based Progra Federal Supplemental Educational Opportunity Grants Federal Work-Study Perkins Loans	ams (administered by participating school Undergraduates only; awards range from \$100-\$4,000 Provides jobs to undergraduate and graduate students, allowing them to earn money to pay education expenses Undergraduate students; the maximum	s) Do not have to be repaid Do not have to be repaid Must be repaid

\*If your parents cannot obtain a PLUS loan, you may be eligible to borrow additional

Unsubsidized Stafford loan funds.

Students who are not eligible for a government-sponsored loan may still be able to get a loan through a private lender, though the government will not guarantee this loan; as a result, it is likely to have a much higher interest rate, possibly as high as 12%.

# **Repaying Student Loans**

Any loan that you obtain will have some kind of repayment schedule that usually starts after graduation. The typical schedule is monthly payments for 10 years, but other schedules are possible depending on your income. These income-dependent repayment schedules will give lower monthly payments when you have little income and higher ones as your income rises. It is also possible to negotiate a longer repayment schedule—sometimes 25 years. The availability of longer repayment schedules means it is possible that an adult who attends college in mid-life using student loans could end up making student loan payments from his or her Social Security check.

One way to understand student loans and the implications of carrying loans is to calculate the monthly payments that such a loan will entail. For example, a graduate with a loan of \$26,240 at 6% annual interest with a 10-year repayment schedule would have monthly payments of \$291.32. You can estimate your payments with an online calculator, as shown in Do the Math 6.2, or calculate this yourself using the math described in Chapters 2 and 5 and a financial calculator or a spreadsheet.

# [Insert Do the Math 6.2: Calculate Before You Borrow]

Student loans have to be repaid, and they are a unique form of debt in that they cannot be

**discharged** (meaning cancelled or forgiven), even if you declare bankruptcy. As of May 2017, lack of payment on federal student loans amounts to about \$137 billion, and to recoup these funds the federal government pursues strategies such as hiring debt collection agencies.<sup>4</sup> If you have defaulted on your student loans, the government can continue to pursue repayment into your retirement years, eventually reducing your Social Security check to repay your student loan.

#### **Non-Loan Sources of Funding**

Most students contribute financially to their own education by earning scholarships or grants, working while in school, or working over the summer. Scholarships, grants, and potential workstudy earnings are awarded by colleges and universities and are parts of financial aid packages. Savings and estimates of earned income are taken into account when those aid decisions are made.

Beyond colleges and universities, donors of scholarships and grants might be the government, an employer, or an organization. Specialized scholarships might take into account your state of residence, the occupations of your parents, achievement (in the arts or athletics, for example), your planned course of study, and other factors. It can take a lot of work to research and apply for scholarships, but it is worth it if you receive one. Most grants and scholarships, however, are given by the college itself to students it hopes to attract. Private colleges with large endowments use merit scholarships routinely as a recruiting tool to persuade students to choose their institution.

As mentioned in Table 6.2, a part-time job called a work-study job may also be part of your financial aid package if you qualify. These jobs typically provide 10 hours per week at a

<sup>&</sup>lt;sup>4</sup> "U.S. Government Officials Play Hardball on Student Loan Defaults," by Bobby Allyn, *NPR*, May 9, 0217, http://www.npr.org/2017/05/09/527540990/u-s-government-officials-play-hardball-on-student-loan-defaults.

reasonable but not great rate of pay. Income earned through work-study makes a small contribution toward your college expenses. The benefits to work-study jobs are that you don't have to look hard for them and your campus employer will offer a schedule that works around your classes. The downside is ten less hours to devote to studying.

Income earned during the summer and between semesters is also a source of funding for college expenses. It is up to you to estimate how much you will be able to or need to earn while school is not in session. As with work-study jobs, the value of a job during school breaks should be weighed against other options. For some people, using a loan to attend summer classes in order to graduate early is a better financial option because they can then enter the full-time workforce earlier. For others, working during school breaks is a key contributor to their college finances.

#### **Calculating the Bottom Line**

The college budgets that you find in brochures and websites listing tuition and room and board costs are not the whole story. Sometimes a relatively expensive school costs less because it offers a financial package that includes more support. Only after you are admitted to a college will you be offered such a package. There are basically four parts of a financial aid package: gifts in the form of grants and scholarships, guaranteed jobs while in school, loans sponsored by the government, and "the rest," which is the gap between what the college can help you with and what you need to make up to pay the bill. "The rest" may be paid by parents, summer jobs, extra loans, etc. It is up to you to figure out whether you will have the resources to attend.

Figuring out what your education will cost and how to pay for it gives you two important numbers: the money you need now and the money you will owe later. Table 6.3 shows a possible

13

comparison between three hypothetical financial aid packages for a student whose parents can afford to contribute \$8,000 per year.

Institution	Brown Technical	Wallace Big State	Lusardi College
	College	University	
Description	Public, in state	Public, out of state	Private, well-funded
Estimated annual	\$22,000	\$32,000	\$42,000
cost			
Financial aid packag	e		
Grant	\$5,200	\$5,200	\$5,500
Merit scholarship	\$0	\$0	\$14,000
Subsidized loan	\$2,000	\$3,000	\$3,500
Unsubsidized loan	\$3,500	\$2,500	\$2,000
Work-study job	\$0	\$3,500	\$4,500
Total financial aid	\$10,700	\$14,200	\$29,500
Remaining amount	\$11,300	\$17,800	\$12,500
Parent's contribution	\$8,000	\$8,000	\$8,000
Remaining amount,	\$3,300	\$9,800	\$4,500
paid by student			

**Table 6.3: Comparison Among Three Financial Aid Packages** 

In this example, you can see that the expensive private school has enough resources to offer a sizeable scholarship that actually makes it more financially attractive than the big state

university for an out of state resident. In all cases, the student will need a loan. But the remaining amount to be paid by the student is only slightly more for Lusardi College than for Brown Tech. It will be easier to earn the remaining \$3,300 needed for Brown Tech because there is no expected work-study arrangement. Perhaps the student could work a part time job during the semester or make all of the money in the summer. If Lusardi College is chosen, the student will have to come up with \$4,500, all or most of which could be earned in the summer, and possibly take out a small auxiliary loan. From the budgets given here, it looks as though considerable extra loans and income would be needed to attend Wallace Big University.

When comparing the costs of different colleges, identifying the best deal depends on what you need from your college education. Aside from costs, you'll want to consider the courses offered for your desired program of study; perhaps a program offered at one school is better than another. Perhaps one institution has such a great reputation that it will make a difference in the job market, potentially impacting future income. As you can see, choosing which school to attend can involve a lot of research and planning.

#### [Begin Case Study Part 1]

#### Case Study Part 1: Meet James

James finished college at Michigan State University, with high honors in the field of advertising and a student loan of \$30,000 at 6% interest. In the years after school, he took a series of jobs all around the Great Lakes area, earning about \$40,000 per year and easily making his monthly student loan payments of \$333.06. But he was unsatisfied with his life. One summer he took a road trip west, and fell in love with Montana. Unfortunately, there were almost no advertising firms in Montana and he wasn't able to find a job in his field. James had a difficult decision to make.

After a lot of searching, James left the advertising field and found a job in Bozeman, Montana as a veterinary assistant. In terms of salary, it was a major downgrade: James is now only making \$24,000 per year. Happy to be in Montana, he tightens his budgetary belt and makes it work, figuring it is a temporary job at best.

After six months of cleaning cages, walking dogs and horses, and being around the veterinarian's kennels and barns, James realizes that he is much happier working with animals than he ever was in his advertising career. Talking with the veterinarian, Lucy, he realizes that he could work at a higher salary, probably around \$32,000 per year, if he had some specialized training to become a veterinary technician. He decides to look into it.

#### **Discussion Questions**

- What would James's take home pay be in Montana if he made \$40,000? What about \$24,000 or \$32,000? Research the income tax rate in Montana using an online paycheck calculator. What is left for expenses after his student loan payment is made?
- James still owes almost \$20,000 on his student loan. If he had made the decision to go to a less expensive school and currently only owed \$10,000, how might this affect his decision to continue his education?
- 3. James is successfully managing on his current paycheck, based on his annual salary of \$24,000. Now he is thinking about investing in further education. If he goes back to school, he probably won't be able to earn as much. Do you think he could live on less than what he is currently making?

#### [End Case Study Part 1]

# PUTTING A VALUE ON A COLLEGE EDUCATION

Only you can put a value on your desires. How badly do you want to be a lawyer, a businessperson, an engineer, a poet? If you want something badly enough, any price may seem worth it. However, when it comes to the price of your education, it may be helpful to think of it like any other consumer decision. For example, when you grocery shop, you can usually find similar products at very different price points depending on where you're shopping. The same goes for education.

If you are in college and have yet to choose a major, or before you decide to pursue further education or perhaps transfer to a different institution, do the math. Statistics abound about pay scales for various jobs and employment rates. Online resources such as the Bureau of Labor Statistics provide detailed information about salary ranges for various occupations. You now know how to determine the likely cost of your education. In the following sections, we'll discuss how to figure out the economic value of education over the long run with some simple research.

# **Choosing a Career Path**

As you read the case studies in this text, you will become acquainted with many different career choices. There are many more options than could ever be covered in these examples. There are so many kinds of work that it may seem impossible at this point in your life to choose among them. And yet, you must. Choose a target to aim for, or possibly an assortment of possibilities, and then work toward that. If you have a talent, capitalize on it. If there are auxiliary skills that will help you get the job you desire, learn them. Choosing your career path means looking into

the future and putting a value on what your education will bring in terms of income, job prospects, and personal satisfaction.

For example, suppose you want to be a doctor. Keep the possibilities of nursing, administration, and public health open also. Look into what these various careers require. Also, consider your desired geographic location. If you want to live in the southwest, for example, polishing your Spanish language skills could give you an edge. If you are interested in public health, knowledge of statistics would be helpful. In all cases, basic computer and spreadsheet literacy is useful. Understanding what you want to do with your life and taking steps to get there gives you direction, so that upon graduation you have more than a piece of paper to work with. And yes, it's okay to change your mind.

Once you have some career goals in mind, it is easy to research likely salary ranges. Table 6.4 shows the enormous range in salary for a variety of health professions.

Profession	Surgeon	General	Head	Staff nurse,	Head	Paramedic
		practitioner	nurse,	recovery	nurse,	
			operating	room	nursing	
			room		home	
Salary range	\$71,000 -	\$86,000 -	\$86,500 -	\$64,000 -	\$58,700 -	\$35,593 -
	\$516,000	\$186,000	\$116,481	\$98,000	\$69,000	\$45,304
Academic	Medical	Medical	Nursing	Nursing	Nursing	High
prerequisites	school	school	program	program	program	school
			plus five	certification	plus five	diploma,
			years of		years of	registered

Table 6.4: Salary Ranges for Careers in the Health Field

	experience	experience	with EMT
			National
			Registry,
			licensed by
			State EMS
			Authority,
			2-4 years
			related
			experience,
			and CPR
			certified

Source: Data accessed from http://www.salary.com/.

As the table illustrates, knowing what your general interests are will give you the foundation to start figuring out how the income from a possible career relates to the cost of preparing for it. For example, completing a nursing program is far less expensive than obtaining an M.D. degree, although the payoff in salary may well be similar.

# **Financial Consequences of Your Education Choices**

Perhaps for you college is just an entryway to life, and not preparation for any particular career. Perhaps you still need to find a job when it is over though. If you are uncertain as to whether college is right for you, it may be useful to consider and compare a handful of careers that require no degree at all to ones that do. Table 6.5 lists salary ranges for a variety of possible jobs.

Job	House	Excavator	Car mechanic	Real estate	Technical	Editor	Cocktail
	painter	operator		agent	writer		server
Salary range	\$23,000-	\$51,000-	\$28,000-	\$38,000-	\$39,000-	\$47,000-	\$11,000-
	\$62,000	\$71,000	\$47,500	\$60,000	\$66,000	\$80,000	\$25,000
Academic	None	High	0-2 years of	Certification	B.A.	B.A.	None
requirements		school	experience,	program	degree,	degree,	
		diploma	apprenticeship,		specialized	specialized	
		and 1-2	or formal		content	content	
		years	training		depending	depending	
		related			on job	on job	
		experience					

Table 6.5: Salary Ranges and Academic Requirements for a Selection of Jobs, 2017

Source: Data accessed from http://www.salary.com/.

As you can see, a college degree might not necessarily lead to a higher income, depending on what you specialize in and the job you choose. Nevertheless, if you plan ahead with a career goal in mind, it certainly can help.

Sometimes first-generation college students are encouraged by friends and family to get their degree in the same way someone might be told to get his or her driver's license. There is a sense that this magical degree will confer opportunities for better job prospects, more money, better social standing, and generally, a better life. Families of first-generation students don't always understand how much work and money it takes to complete a four-year degree. But they may still believe that a college degree is necessary to function in society. These beliefs are true, but only to a certain extent. It really depends on what you study, what your plans are for a career, what the costs of your degree are, and what your backup strategy is, if those plans don't work out.

From the various comparisons made so far, you can see that in general, a college education leads to higher salaries later in life. However, this depends very much on what kind of preparation you get and what kind of job you find. For example, suppose Linda finishes her degree in chemistry with the idea that she will go to medical school. She has no loans and is ready to go into debt in order to become a doctor. Unfortunately, she cannot get in because her MCAT scores just don't measure up. What can she do? To take the MCAT again she will have to wait a year. So she gets CPR training and registers as a paramedic to pay her bills and get some experience while she studies. However, a thorough search shows that, if she wants, she could get a nursing degree for far less and still improve her income from \$40,000 as a paramedic to \$60,000 as a beginning staff nurse. She looks into a program that will cost \$20,000 to complete. Linda will take the MCAT again, but her fallback position will be this nursing program.

#### [Begin Case Study Part 2]

#### Case Study Part 2: James Calculates His Education Costs

The nearest veterinary technician program James finds is at the College of Southern Idaho. It will take three semesters, or 32 credits, to complete. As James is not a resident of Idaho, the tuition is \$280 per credit. The total tuition, \$8,960, seems to James like a bargain. He has \$10,000 in savings, and he feels this would be a good use for it.

Having identified, applied to, and been admitted to the Vet Tech program at the College of Southern Idaho, James is now figuring out his finances. Lucy has encouraged him to do the program, promising him a temporary job at her clinic during the summer and winter breaks. About four months of work would add \$8,000 to his budget annually. Of course, she cannot promise him a job as a vet tech in her clinic, but she has pointed out that the general demand for vet techs is quite a bit higher than for veterinary assistants.

The program offers James a work-study job that would earn him \$3,000 over the three semesters he will be in school. James also receives a \$1,200 merit scholarship to the program. James sketches out an income and expense statement for the 18 month, three-semester program, shown in Table 6.6.

Item	Income	Expense
Savings	\$10,000	
Summer and break income	\$8,000	
Scholarship	\$1,200	
Work-study job	\$3,000	
Tuition		\$8,960
Living expenses		\$1,000 per month * 18 months = \$18,000
Student loan payments		\$333.06 * 18 months = \$5,005.08
Totals	\$22,200	\$31,965.08
Difference: extra funds required	\$9,765.08	

To meet the extra expense, James plans to take out a student loan for \$10,000 at 5% interest.

Using the standard 10-year payoff schedule, this will cost \$106.70 per month after he finishes his

degree.

In addition to the direct expenses, by attending the program James will lose income from the job he otherwise would hold, giving up the difference between twelve months of income as Lucy's assistant (\$24,000) and the modest income from the work-study job (\$3,000). Money lost by foregoing one option in favor of another is the opportunity cost of the decision to pursue the degree.

James figures that, including his own savings, the new loan he would have to take out, and the opportunity cost of his decision, the vet tech degree will cost him \$29,000 total. After he finishes the degree, it will cost him an extra \$106.70 every month for ten years. On the other hand, if he lands a vet tech job paying \$32,000 per year it will increase his take-home pay substantially, from the current monthly amount of \$1,529.60 to \$2,005.27 per month, a raise of \$457.67.

#### **Discussion Questions**

- 1. How did James calculate the cost of his extra education (\$29,000)? Does it seem appropriate to include the opportunity cost of lost work income as part of this calculation?
- 2. When James completes this program, what will be the impact on his immediate financial situation, assuming he gets a vet tech job at \$32,000 per year? How will his monthly budget be affected?
- 3. How will the program affect his balance sheet? Construct his balance sheet for before and after the program. How long before the extra debt on his balance sheet is repaid by the increase in his new, larger budget?

4. The main risk James will take with this decision is that he will not find a better paying job after completing the program. If he returns to his job as veterinary assistant, how will his immediate financial situation change? How about his future financial situation?

[End Case Study Part 2]

# **POST-GRADUATE DEGREES**

According to the U.S. Census Bureau, in 2012, 10.9 percent of people in the United States over age 25 had post-graduate degrees, and 1.68 percent of Americans over the age of 25 had a PhD. The statistics of education are telling. As Figure 6.3 shows, more education results in higher salaries and less chance of unemployment, on average. Nevertheless, statistics do not tell the whole story, as the value of extra education depends very much on what that education is for and how it is financed.



Figure 6.3: Earnings and Unemployment Rates by Educational Attainment, 2015

Source: https://www.bls.gov/emp/ep\_chart\_001.htm

Many jobs require a post-graduate degree. Medical and technical jobs may require a masters, Ph.D., or M.D. degree. Teaching at the college level generally requires a **terminal degree** in the field (Ph.D. for most subjects, M.F.A. for fine arts). But there are many more examples, including physician's assistant, organizational psychologist, computer and information systems managers, financial managers, lawyers, and so on. Even jobs that do not require an advanced degree, such as teaching, often reward more education with higher salaries or more options within a given career path.

#### **Costs of an Advanced Degree**

An advanced degree could cost an enormous amount or it could cost virtually nothing. At one extreme, a Ph.D. in a scientific field often comes with a tuition waiver (no tuition charged at all), and a stipend or a job as a teaching or research assistant, which normally pays enough to cover living expenses, though not much more. The cost of such a degree is its opportunity cost—what extra money the graduate student would have made if employed in the regular workforce. The payoff can be quite good if the Ph.D. recipient lands a desirable job. The decision to pursue such a degree carries a low risk.

At the opposite extreme is medical school, which is estimated to cost over \$200,000 with the average graduate owing \$170,000 in loans. Note that a loan of this amount at 5% interest over a 25-year period will result in monthly payments of nearly \$1,000. After graduating, the new M.D. can expect three to seven years of low-paid internship and residency positions before earning a doctor's salary as a doctor. For example, a practicing pediatrician who has completed all education and training will earn around \$200,000 per year, resulting in monthly take-home

25

pay of around \$10,000. This should be plenty to cover the cost of the loan, but the loan burden may constrain a young physician's choices, for example preventing them from taking low-paying jobs of social importance, such as working for an organization such as Doctors Without Borders. In addition, one study estimates the cost of medical school, factoring the opportunity cost of lost wages throughout the degree program, internship and residency, as close to \$800,000. Therefore, the decision to pursue this career is a serious one financially as well as academically.

The costs of a particular advanced degree do not necessarily correlate with the salary increase indicated by the averages in Figure 6.3. One study, for example, gives the average costs of getting an M.F.A. in creative writing as \$30,000. If you are trying to become a professional novelist, it is not clear that this investment will increase your income in the short run. Your readers and the publishers of novels do not care about your degree. If you go into debt to take the degree, the loan payments will stay with you for a long time. It might not be worth it. On the other hand, if the M.F.A. gives you the credentials you need to teach writing, it might very well be worth it. Alternatively, if you are currently a cocktail waiter, the switch to a teaching career might improve your salary quite a bit.

If you can estimate your future salary after obtaining your graduate degree, you can calculate the financial value of the degree, as explained in Do the Math.6.3.

# [Insert Do the Math 6.3: Calculating the Return on an Education Investment]

#### **Sources of Funding**

Graduate students can take out loans, receive merit scholarships or tuition waivers, and hold jobs as research or teaching assistants to support their graduate education. The likely mix will vary enormously between fields and even among institutions offering similar programs and degrees. As with all important financial decisions, it is important to do some research in advance to see what the norms are in your area of interest. It is equally important to apply to a broad range of schools, because financial packages will vary among your offers, often even more than they vary with undergraduate programs.

# **Calculating the Bottom Line**

As the costs of graduate degrees vary so much, the most important thing to point out here is that you need to do calculations and consider the three questions for financial decision making. As graduate students do not normally receive parental support, these questions are even more critical for your decision to pursue an advanced degree.

Even when you have figured out how you will support your advanced degree, it is still worth doing a **cost-benefit analysis**. This means comparing your likely financial situation after the degree with the cost of the degree itself. It is easier to do this with advanced degrees, as they are usually more specific to a certain career path than undergraduate degrees.

#### [Begin Case Study Part 3]

#### Case Study Part 3: James Considers His Alternatives

As much as James enjoys working with animals, he hesitates to enroll in the program in Idaho. He feels that, although it would improve his prospects for a vet tech job, it is a narrow course of study that won't prepare him for anything else. He doesn't fear the risk of unemployment, and he doesn't fear the extra debt, but the prospect of both does feel risky.

The more he thinks about it, James realizes that the technical aspect of veterinary medicine was not what actually attracted him to his job. Rather, it was working with the animals

and watching their reactions to being handled that really interested him. Perhaps a career as an animal trainer would be a better path. He talks it over with veterinarian Lucy, who assures him that unless he worked in a very wealthy area, work as an animal trainer is unlikely to improve his income much. However, it could be helpful in combination with a vet tech degree. But if one course of study is expensive, two would be even more so. In his haste to apply to the Idaho program, James had not really explored other alternatives. Now he does so, and broadly.

A thorough search turns up a Ph.D. program in animal behavior at the University of California Davis. UC Davis is well known for its veterinary school. More research turns up a way to become a registered vet tech through UC Davis with a combination of continuing education courses and on-the-job training followed by an exam. Both of these sound interesting. James thinks he could find a low-level veterinary assistant job and pay by the course until he has enough continuing education credits to take the exam. Alternatively, he could apply to the Ph.D. program and, if he got a fellowship, could complete the program and at the same time take the continuing education courses at no extra cost. But what would the fellowship pay? Would it be enough to support him, or would he need more loans?

James emails the chair of the department and is astonished to discover that the graduate fellowship, should he receive it, would cover all tuition and fees and pay a stipend of \$22,000 per year. Going into this program, he would be making nearly as much as he now made as a veterinary assistant. If he organizes his life well, he could come out of the program with a Ph.D. in animal behavior, substantial experience with animals, a vet tech certification, a much broader range of job options, and no further loans. Even if he left the program after two years, he would still have all of the above except for the Ph.D. With enough credits, he might have a master's degree at that point. If he hated the program and left after the first year, he at least would not

28

have any extra loans. It seemed like a low-risk choice, assuming he could get into the program and obtain a fellowship.

Lucy agrees to write a recommendation letter for James, as do several of his professors from his undergraduate days. James sits down to compose his personal statement: "As an advertising major, I was terribly interested in human behaviors, and how these behaviors translated into sales of an idea or product. But in the last few years I have spent far more time thinking about animal behavior and about the striking similarities and differences between animals and humans..."

# **Discussion Questions**

- How many jobs for veterinary technicians do you suppose there are in the state of Montana? Do some online research and make an estimate. What do you think James's prospects will be in that job market?
- 2. While not giving up on a vet tech certification, James is choosing a path that will potentially prepare him for a broader selection of jobs, although it will take much longer. What are the pros and cons of his decision?
- 3. If James gets into the UC Davis program but does not receive a fellowship, what are his options?
- 4. Can you think of any other examples where more education might be more financially attractive than less education?

[End Case Study Part 3]

#### Working with the Three Questions

There are many kinds of education and many good reasons for pursuing a particular degree. There are financial consequences to obtaining a degree that are both positive and negative because there are rewards to a college education but also costs. Therefore, it is extremely important to look at the financial side of your education and ask these questions:

- 1. How will this decision affect my present finances?
- 2. How will this decision affect my future finances?
- 3. What risk will I be taking with this decision?

# 1. How will this decision affect my present finances?

For students entering college, the first question, How will this decision affect my current finances? can be translated to *Will my financial aid package really cover my expenses?* If there is a gap to be filled between resources and needs, how will that happen? For those considering advanced or auxiliary degree programs for which no financial aid package is offered, you have to figure it out yourself. The question relating to your present finances then becomes, How much do I need to live on while completing this degree, and how will I pay my monthly expenses while I am in school?

# 2. How will this decision affect my future finances?

When considering the costs of education, this question translates into this: What will my future salary likely be as a result of this education, what loans will I need to fund this education, and what will my future loan obligation and monthly payments be? The answer to this question is different for everyone and the only way to answer it is to do research and make calculations.

# 3. What risk will I be taking with this decision?

The third question for financial decision making, "What risk am I taking with this decision?" relates first and foremost to the employment opportunities that depend on the degree. Will there be work in your field? You take the risk of preparing for opportunities that may not emerge after graduation. A secondary risk is the "opportunity cost" of lost work during your education. For example, some degrees lead to high paying work, but losing a few years of work to obtain an advanced degree may represent a substantial loss of income or missed job opportunities. A third risk is the potential difficulty of paying off student loans (and other debt incurred while in school) if payments turn out to be unaffordable after graduation.

#### [Begin Case Study Part 4]

### Case Study Part 4: James, Five Years Later

James excels at his graduate program and, five years later, is about to graduate. He also used every spare minute to certify as a veterinary technician. At graduation, his only debt is the remaining balance on his undergraduate student loan for his undergraduate degree. It has been seven years since he graduated with that loan of \$30,000 at 6% interest. It was a 10-year loan and now he has only three years left of monthly payments of \$333.06. He has needed no further loans and has no other debts, but has saved \$4,000 in a bank account.

He now has more choices to make. He is offered a position as a postdoctoral research assistant in an animal behavior lab in downtown Los Angeles, at a salary of \$60,000 per year. The job is paid for by the researcher's grants, which will fund two years of work and may or may not be renewed. He has a second offer teaching biology at a small liberal arts college in Virginia, with a salary of \$65,000 and the potential for earning tenure in six years. The teaching load is high and there will be little opportunity for research. A third opportunity is a similar teaching job at a community college in Montana. There, he would teach even more but at least be in Montana, which he would greatly prefer to any urban setting. The job pays \$40,000 and, although there is no tenure mechanism, the faculty have some job protection through a union. Finally, to confuse him further, Lucy calls and congratulates him on his degree. Then she offers him a position with her veterinary hospital as both vet tech and animal trainer. She can afford to pay him \$35,000.

What does James do? In the end, he takes the job with Lucy.

#### **Discussion Questions**

- What does James's balance sheet look like upon graduation from his Ph.D. program? How much does he now owe on the student loan?
- 2. What would his take home pay look like in each of these jobs?
- 3. How does the cost of living compare in Los Angeles; Washington, D.C.; and Montana? Is the pay difference enough to compensate for the increased cost of living?
- 4. Do you think James made a good decision? Why or why not?

# [End Case Study Part 4]

# **CHAPTER SUMMARY**

Higher education is a big undertaking, requiring time, hard work, and financial support. Making all of these things work together to give you the life choices you desire without undue financial burden requires using the three questions for financial decision making over and over again, and doing plenty of math to estimate the answers to those questions. In the context of education, answering these questions means doing the following:

• Calculate the present and future costs of your education before choosing a school. If you

haven't done this yet, do it now! And if your parents are helping you out, don't forget to think about the cost to them as well. Make sure to consider your loan repayment schedule and how you will be able to make those payments.

- Balance education costs against the likely income from the career for which you are
  preparing. You are preparing for a career, right? If not, it is time to think about career
  options, both in terms of your personal preferences and in terms of your likely financial
  future. This includes graduate degrees, extra certifications, and so on, that you might
  want to pursue based on your personal desires and on likely financial returns from any
  degree program.
- Understand the alternatives for funding your education: grants, work, loans, and parental assistance. When comparing these alternatives, do the math carefully. This means both the math of your present budget and the math of your future financial situation.
- Consider the risks of the path you want to take. Always have a "Plan B" in case your job choice doesn't come through.

# **KEY TERMS**

**Cost-benefit analysis:** A comparison of the financial benefit of a decision with the costs associated with the decision.

**Discharged:** Cancelled or forgiven (as in a loan).

**Financial aid package:** An official document from a college or university that outlines the scholarships, grants, and loans available to that student via the institution.

**Free Application for Federal Student Aid (FAFSA):** A form prepared annually by current and prospective college students in the United States to determine their eligibility for financial aid.

Grant: Financial assistance for education that does not have to be repaid.

**Scholarship**: Financial support for educational purposes, usually awarded based on achievement in academics, athletics, the arts, or endeavors.

**Subsidized loan:** A loan for undergraduate students with financial need, which does not accrue interest while students are in school at least half-time or during deferment periods.

**Terminal degree:** A university degree that is either highest on the academic track or highest on the professional track in a given field of study.

**Unsubsidized loan:** A loan for which the student borrower is responsible for the interest charged on the loan during the in-school and grace periods.

# **CHAPTER HOMEWORK**

#### **Check Your Understanding**

True or false:

- 1. A college degree guarantees a higher income.
- On average, people with college degrees have higher incomes than those without college degrees.
- 3. Loans to college students never have to be repaid until after graduation.
- 4. Loans to college students never accrue interest until after graduation.
- 5. Higher education should be thought of as an investment.
- 6. How financially advantageous your degree will be depends on your area of study.

# Do the Math

1. Angus will finish his degree from the University of Nebraska with \$15,000 in student

loans at 5.25% interest for 10 years. What will his monthly payments be after graduation?

- 2. If Angus chooses to put an extra \$50 toward the principal of his loan every month, when will the loan be paid off?
- 3. Nohea finished his degree at the University of Hawaii with \$30,000 in student loans. One subsidized loan was for \$21,000 at 5% interest for ten years. The remaining \$9,000 was an unsubsidized student loan at 10.25% interest for five years. What will Nohea's monthly loan payments be for the first five years after graduation?
- 4. Reanna recently graduated from a two year program at Delaware Technical and Community College and has \$4,000 in ten-year student loans carrying a 5% APR. The loans require a monthly payment of \$42.43, but Reanna determines that she would like to pay down her loan more quickly and so decides to pay \$80 a month. How long will it take Reanna to pay down her balance if she pays \$80 a month?
- 5. Umeko is about to finish her MBA from the Tuck School of Business at Dartmouth. To get this degree she took out \$125,000 in loans at 5.50% interest for 10 years. What will her monthly payments be?

# **Thinking Hard**

- Is it a good idea to pay more for a degree in engineering than a degree in art? Why or why not?
- 2. Suppose you really love a particular line of work and you expect to be able to make \$55,000 per year after graduation doing this line of work. You know that some more expensive schools are also more likely to result in good employment prospects in your field. How much would you be willing to borrow at 7% interest with a 10-year term in

order to go to the "best" school? Back up your answer with numbers.

- 3. Is there ever a situation where a college education would be a waste of money? Explain.
- 4. Is there ever a situation where an incomplete college education that resulted in no degree would still be a good use of money? Explain.

# Working with the Three Questions for Financial Decision Making

Bly is a junior at the University of Mississippi. He currently has \$22,000 in subsidized student loans at 6.25% interest with a 10-year term that will begin after graduation. He feels he will need to borrow another \$8,000 to get through his senior year. He cannot get any further subsidized loans. Bly hopes to get work as an entry-level biologist after graduation, and he has read that the median salary in his area is approximately \$47,000.

- He could obtain a personal loan from a private lender at 12% interest with a 10-year term beginning immediately at the start of his senior fall term.
- Alternatively, he could obtain a credit card at 20% interest and use it to make up the \$8,000. He would make only the minimum payments while still in school.
- A third option has also occurred to him, which is to take a year off from college and work enough to earn the extra money he needs. He would have to make payments on his subsidized loans while not in school.

# **Question 1: How will this decision affect my present finances?**

How will each of these options affect Bly's current finances? If he is making payments while still in school, will he actually need to borrow slightly more money? How much?

#### **Question 2: How will this decision affect my future finances?**

Assuming Bly does get the job he wants, what will his take home pay be when he starts the job? What will his loan payments be in each of the scenarios above? In the case of the credit card scenario, assume he wants the card paid off in five years. Suppose Bly can realistically estimate his future living expenses at \$2,000 per month. Which, if any, of these three scenarios will present a burden?

What if you assume that Bly's salary will increase at 2% per year over the years? Does this change your answer?

Suppose Bly does not get the job he is hoping for. How much will he have to make at some other job in order to meet his living expenses and loan payments, for each of the scenarios given?

#### Question 3: What risk will I be taking with this decision?

What's the biggest risk involved in Bly's decision? If Bly takes a year off from school, what is the opportunity cost of losing a year's salary? How do you feel this compares with the cost of another loan, in each of the three scenarios?

#### **Case Study**

Celia was a good student in her competitive Virginia high school, although not at the very top of the class. She received AP credit for four courses, as proof of her hard work. When the time came to apply to college, there was never any question that Celia would go to a good school. But both she and her parents hoped she could go to a great school. Celia applied to a dozen schools, some good, some great, and some in between. She crossed her fingers and waited. When the dust settled in the spring, there were two possibilities that interested her. One was Virginia Tech, a state university. Tuition at Tech was about \$8,500 per year, and estimated room, board, and other expenses came to about \$12,000 per year. Celia got a modest scholarship of \$3,000 per year and qualified for a subsidized student loan of \$5,000 per year. The financial aid office also provided a work-study job paying \$3,000 per year. The remaining \$9,500 would have to be made up somehow and Celia's parents were happy to contribute this to her education.

The second option was a little more appealing to Celia. Loyola University of Maryland is a Jesuit university within which Loyola College is a liberal arts college. It was smaller than Tech, a little more intimate, with a beautiful campus and a high rating among colleges in the area. Celia felt strongly that she would have a better college experience there. Tuition at Loyola was about \$45,000 and estimated room, board, and other expenses were around \$15,000. The impressive annual bill of \$60,000 was offset somewhat by a generous scholarship of \$20,000, a work-study job paying \$3,000, and a subsidized student loan of \$5,000 per year. The remaining \$32,000 would have to be made up somehow. Celia's parents respected her strong desire to attend Loyola although they didn't completely understand it. They said they could afford to pay \$16,000 per year so Celia could get the education she wants. Celia would work in the summer and earn \$2,000, but would have to take an unsubsidized loan of \$14,000 per year to pay the remainder.

In the end, Celia chose Loyola. She got a subsidized loan of \$5,000 per year at 4% interest, with no payments due or interest accrued until graduation. She also took out an unsubsidized loan of \$14,000 at 8% interest, with interest payments due monthly until graduation but no principal due until after graduation. She planned to major in Spanish and minor in political science. She hoped to attend at least one, if not more, of their foreign study programs, with the somewhat vague goal of a job in the foreign service or international development. She

38

feels that the preparation, recommendations, and connections she will have through Loyola will be more likely to get her this career than if she attends Virginia Tech.

In her first year, Celia applied for a foreign study program the following year in Spain, and got in. She did a good job in all of her courses, receiving a lot of A's and a few B's. She loved Loyola and felt it was exactly what she wanted for her education.

At the end of the first year, though, Celia got the loan statements. She owed \$19,000 in loans, and would have to start paying interest on the unsubsidized loan of \$14,000. If she had gone to Virginia Tech, she would owe nothing. Instead of the exciting foreign study program, she could get a summer job, earn some money, and go to Spain on her own if she wanted. Maybe her choice was a terrible mistake. Maybe she should transfer immediately to Tech. Celia panicked. She needed someone to help her think this through, and she called you. Your job is to help her figure out whether she can really afford Loyola, and then help her to make a completely informed decision.

# Part 1: Do Some Research

If Celia stays at Loyola, what will her loan payments be during each of her college years and after graduation? Is \$76,000 really that big of a loan? How does it compare to loans people typically take for cars, houses, other large purchases. Should a young person fear a loan of this size?

If she transfers to Virginia Tech, what will Celia's loan payments be? What if she takes a year off and works while living at home? Make spreadsheets for three different possibilities: Loyola, VA Tech, Loyola with a year off. Can you think of any other strategies? Offer at least one more possibility and create a spreadsheet for that also.

39

What kinds of jobs are open to her after graduation? In addition to government jobs in the foreign service or other similar positions, what might her choice of major and minor prepare her for? If she graduates and does not immediately find work, how much will she have to make to cover her loans and living expenses in the greater D.C. metropolitan area while she looks for government related work? Create budget spreadsheets for what her monthly cash flow will look like right after graduation in each of these situations.

#### Part 2: Make a Plan

What do you recommend Celia should do? Justify your recommendation by comparing the four scenarios you worked out above, summarizing your reasons for choosing the path you recommend, and giving a complete financial picture of the consequences of that choice.

#### You Are Your Own CFO

Identify the educational requirements for each of the career paths that are part of the three scenarios you created in Chapter 1. What is the possible range of costs for the necessary degrees for those careers? Assume you needed to take out loans for 50% of the cost of those degrees. How does that debt repayment impact your budget in those three scenarios?

**Consider Your Present Situation:** Do you now have or do you anticipate having student loan debt? What is the total amount of debt you will have (or you anticipate having) once you have graduated? What type of loan do you have? What is the interest rate on the loan? How much will those loans cost you per month once you graduate, assuming a repayment period of ten years?

### **CHAPTER 6 FEATURES**

#### Do the Math 6.1: Implied Interest Rate on Subsidized Loans

The government subsidizes student loans both by offering lower interest rates and because interest does not accrue on the debt while students are in college. But how large is the latter subsidy and what does it entail? We can show that it is equivalent to getting a loan with a very low interest rate.

Let's calculate the implied APR incurred on a \$5,500 Perkins loan with an APR of 5% borrowed during a student's freshman year of college. The student will be required to repay the loan over ten years in annual installments. (In reality, Perkins loans require monthly payments, but for simplicity, we assume that all payments are annual and occur at the end of the year. We also assume the payments start after a year, not 9 months).

If the student repays the loan according to schedule, no payment is due during the first five years. After that, ten equal payments are due:



Because of the subsidized interest and grace period, no interest accrues over the four years the student is in school and for another year during the grace period. Therefore, the payments are calculated as if the loan is taken out at the start of the sixth year. You can use a financial calculator to find the annual payment, which is \$712.30.

Name	Value	Compute
Present value	\$5,500	pv
Future value	0	fv
Number of periods (years)	10	np
Payment amount	\$712.30	pmt
Interest rate per period	5%	ir
	☑ Beginning	Clear
	□ End	

While the payments are calculated *as if* they started as soon as the loan was disbursed, in fact, there was a five-year lag. The government gives a loan of \$5,500 at time zero. For five years there are zero payments and then starting at year 6, there are ten payments of \$712.30. Time is money, and the fact that the student didn't have to pay in the first five years has value. The implied interest rate on the loan is, in fact, 2.72%, much lower than the stated 5% APR. To do this calculation requires using the cash flow feature of a financial calculator, which will be introduced later in the text.

# Do the Math 6.2: Calculate Before You Borrow

Many people engage in student loan contracts without fully understanding the future implications of repaying those loans. You should know the amount you will need to borrow to meet the cost of your education and how much it will cost you each month once you are out of school to repay those loans.

In 2017, all students who submit the FAFSA are eligible to borrow a total of \$27,000

over the course of a four-year undergraduate degree program. A portion of that amount will be unsubsidized loans and a portion will be subsidized (varying from person to person and school to school), so the exact amount due after graduation will vary somewhat, but for the sake of this calculation let's assume the amount owed is exactly \$27,000.

Use an online calculator to determine what the monthly payments will be by customizing the following inputs to match the loan specifications:

Loan Balance	\$27,000
Interest rate	6%
Loan fees	\$0
Loan term (years)	10
Minimum payment	\$50
Enrollment status	Still in school
Degree program	Bachelor's degree
Total years in college	4

Calculator adapted from: http://www.finaid.org/calculators/scripts/loanpayments.cgi

The calculator tells you that the monthly loan payment will be \$310.72; with a total of 120 payments, the cumulative payments over those ten years will be \$37,285.87, meaning that a total of \$10,285 in interest will be paid on the \$27,000 borrowed.

# Do the Math 6.3: Calculating the Return on an Education Investment

Higher education is an investment. The return on that investment is the higher income you can

gain as a result of the years of education and training. It is possible to do some calculations to estimate the value of the education you are considering. For example, consider a student pursing a two-year MBA degree with tuition of \$75,000 per year.

Without the MBA, the student would expect to earn around \$50,000 per year for the two years spent in school and for 40 years thereafter until retirement. (Let's assume, for simplicity, a 0% annual cost of living increase each year.) Counting the opportunity cost of missed employment when in school, the cost of this education is \$125,000 per year because it includes the \$50,000 of foregone annual income and not *just* the \$75,000 tuition.

With the MBA, the student would earn nothing while in school, but would expect to earn around \$80,000 per year—\$30,000 per year more than the amount earned without the degree—beginning the first year after graduation.

To visualize the costs associated with this decision, it is helpful to create a timeline that shows the cash flows that result from the decision to pursue an MBA. The additional cash flow resulting from a change in your financial situation is referred to as an incremental cash flow. On a timeline, the incremental cash flows of pursuing the MBA look like this:



Note that the cost in years 1 and 2 is \$125,000. After those initial two years, there is an increase of \$30,000 per year resulting from the MBA degree.

We can estimate the value of getting a degree by first using a financial calculator to determine the present discounted value of the higher income that the degree will bring over the

lifetime. The present discounted value is the current value of the stream of future cash flows.

Assuming an annual interest rate of 8%, at the start of the job, the present discounted value of all of the increases in income the MBA will bring is \$357,738.40. The calculator inputs are shown below.

Name	Value	Compute
Present value		pv
Future value	0	fv
Number of periods (years)	40	np
Payment amount	\$30,000	pmt
Interest rate per period	8%	ir
Payment at:	□ Beginning	Clear
	☑ End	

Then consider the tuition costs (\$75,000 per year for two years) and the foregone income for going back to school (\$50,000 each year for two years) and calculate the total cost at the start of the job (after two years of schooling). The costs are as follows: \$125,000 + \$125,000 (1 + 0.08) = \$260,000. Take the difference between the present discounted value of all future income and the cost of the MBA at the start of the job. The net present value (\$357,738.40 - \$260,000) is \$97,738.40. Thus, the net value of the MBA is positive and substantial.

However, because these values refer to the future, they are not certain, so there are risks involved. Such an analysis is sensitive to the inputs, about which there exists some uncertainty. Therefore, it's helpful to consider a range of cases. The following table assumes the same \$75,000 tuition and \$50,000 base salary, and shows the net present value for different discount

	Post-MBA Salary				
Discount rate	\$60,000	\$70,000	\$80,000	\$100,000	\$150,000
3%	(\$21,305)	\$196,574	\$414,453	\$850,211	\$1,939,605
4%	(\$52,767)	\$130,229	\$313,224	\$679,215	\$1,594,191
5%	(\$76,788)	\$78,850	\$234,488	\$545,764	\$1,323,953
6%	(\$95,263)	\$38,649	\$172,560	\$440,383	\$1,109,941
7%	(\$109,558)	\$6,886	\$123,331	\$356,219	\$938,441
8%	(\$120,674)	(\$18,439)	\$83,795	\$288,264	\$799,435
9%	(\$129,346)	(\$38,804)	\$51,739	\$232,824	\$685,537
10%	(\$136,124)	(\$55,305)	\$25,514	\$187,151	\$591,244

rates and post-MBA salaries (values in red indicate negative net present values).