

YOUR MONEY MILESTONES



A GUIDE TO MAKING THE
9 MOST IMPORTANT
FINANCIAL DECISIONS
OF YOUR LIFE

MOSHE A. MILEVSKY, PH.D.

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Prologue: Financial Deicide

From early November 2007 to mid-March 2009, I watched in horror as about half of my family's financial net worth, made up mostly of common stocks and mutual funds in our retirement investment accounts, disappeared into thin air. This wasn't a trivial sum of money: It was in the high six digits. It is far more than my wife or I can possibly earn in any given year. Like many other investors around the world who experienced similar losses, I managed to achieve this stunning feat by complying with every known morsel of established financial planning wisdom. *I lost hundreds of thousands of dollars by doing everything exactly right.*

I didn't own much in the way of speculative penny stocks, nor did I take a flyer on some exotic junk bond funds, commodity derivatives, or collateralized debt obligations. Instead, I built an ultra-low-cost, globally-diversified portfolio that included what were (at the time) some of the most solid, well-respected, and best-known companies—like American International Group (aka AIG), Lehman Brothers, General Motors, Nortel, and so on. I bought and I held.

This, of course, is exactly what the mainstream financial planning and investment industry had been preaching for years. I know this because I have taught it to my undergraduate business students for almost 20 years.

The spectacular destruction of value that I and many others experienced has caused many investors to question the underlying premises of almost everything they've been taught about investment risk, asset allocation, wealth management, and financial planning. And, although markets have recovered since the March 2009 lows, the financial situation is still precarious. Indeed, the mainstream financial news media—including the venerable *The Wall Street Journal* and the *Economist* magazine—have joined the backlash against modern portfolio theory and the perceived wisdom of decades. Numerous financial commentators are questioning the views that financial markets are efficient, or that stocks outperform bonds in the long run, or that asset allocation and portfolio diversification are appropriate

strategies for individual investors. Indeed, entire books have recently been published with the sole purpose of arguing that we've all been wrong for the last quarter century. Financial heroes and their money gurus are being slaughtered.

Spectators to this “financial deicide” are thus left to wonder: “Okay. So, what am I supposed to do with my money? If all the received wisdom is out the window then how do I make financial decisions?”

Two Opposing Views of the Future

Let's step back for a minute to get a wider view. Today, there are two prevailing and very opposing philosophies for thinking about how to navigate the world of stock prices and interest rates. You can think of them as the *roulette* approach on one side, versus the *nuclear* approach on the other.

According to the *roulette* view, estimating your portfolio's and investment's future value is akin to predicting the odds of getting red versus black, or odd versus even, on the roulette wheel at the casino. That is, given sufficient data about the previous behavior and possible outcomes of the market (or the wheel), you can predict the odds of success or failure—and make money—with reasonable confidence. In fact, casino managers at Las Vegas and Atlantic City have a long list of mathematicians and statisticians who are supposed to be bounced from the tables, on sight. Apparently they are just too good to be allowed to play.

In contrast, the *nuclear* approach asks us to consider the odds of a nuclear accident—similar to Three Mile Island or Chernobyl—occurring in a given time period. But this problem is quite different from calculating the odds of red versus black. You could claim that over the 60 years since the advent of nuclear energy—which is 21,900 days—we've had accidents on two of those days; ergo, the odds of disaster must be 2 in 21,900. However, this argument is ridiculous. It is impossible to predict a nuclear accident using any statistical or historical model, and no one seriously tries. Instead, unpredictability is a given in the nuclear environment, and risk is managed in various ways.

Now, back to stock markets: For many years, financial researchers—myself included—firmly believed that markets were like roulette wheels (if you’ll forgive the analogy), in which future odds and probabilities can be derived and stated with confidence.

Now, though, many are starting to wonder if stock markets are better described like nuclear events (if you’ll forgive *that* analogy). Accidents and meltdowns can occur at any time and without much warning. But if markets are more like nuclear events than roulette wheels, then historical relationships might not be very relevant for interpreting and predicting the future at all, and finding a way to navigate this reframed future requires new approaches.

In light of this dilemma, this book is an attempt to go back to arithmetic basics to provide some guidance on how to make financial decisions. Moreover, this advice doesn’t require you to assume very much statistically about the world around us, *other than that the future is unpredictable*. Working from the nuclear metaphor of uncertainty (versus risk), this book offers a guide—based on arithmetic operations that are no more complicated than addition, subtraction, multiplication, and (most important) division—to help you properly and confidently manage the nine most important financial decisions you will make in life.

Aiming for the Best Outcome

The tools I give you for making financial decisions are, as I’ve said, extremely basic. But the approach I suggest is not simply “use arithmetic to solve personal financial problems.” Instead, in thinking about ways to move forward, I was inspired by another group of scientists working—and succeeding—in an environment of uncertainty. And so, there’s one more idea I want to introduce now, as it will shape discussions in the rest of the book.

As I complete this manuscript in July 2009, we are closing in on the 40th anniversary of the U.S. astronauts’ first walk on the moon. In the late 1950s, when the U.S. space industry was racing the Soviets to dominate the “final frontier,” a group of research engineers developed and ultimately refined a new branch of science now known as Dynamic Control Theory (DCT). This theory was created in response

to the formidable challenge facing the engineers, who had to launch a rocket far into space without managing or even knowing many of the conditions in the atmosphere and beyond. Boiled down to its intuitive essence, DCT—which is now taught in engineering and mathematics departments all over the world—is a framework that helps decision makers carefully utilize the levers and knobs that are available for adjustment, while openly recognizing the multiple variables over which they have no influence (and hence for which no levers or knobs are available).

In applying DCT, one of the key steps is scoping out all the factors that can be quantified for a given decision, and then selecting an objective function that weighs the relative importance of each, to evaluate how good a proposed solution is. When this broad framework has been established, the engineering team can work from controllable variables and quantified factors to make the best possible decisions in the face of unknown factors and uncontrollable variables. DCT is both powerful and useful because it acknowledges the substantial randomness that you face over long periods of time and provides a decision-making mechanism that ultimately tries to maximize the odds of a regretless outcome.

I think the DCT metaphor is apt for personal finance because one of my core beliefs is that a large part of our financial future is uncontrollable. Great wealth, good fortune, and economic success can be influenced by random luck, uncanny timing, and other factors outside our immediate authority. In fact, you can argue that even for the brightest and hardest working among us, the bulk of our financial successes and economic failures is unpredictable. If this is true, when making financial decisions, all there is to do is aim for the best outcome across the remaining minority of possible scenarios you can foresee and control.

Accordingly, the mission of this book (so to speak) is to provide you with a useful guide to making milestone financial decisions through your entire life cycle. Where applicable, I include links to online calculators so that you can work through and quantify issues for your own life. (All the calculators can be found at www.quema.ca.) Each chapter in this book builds toward a comprehensive foundation. Nevertheless, each chapter, which explores a different financial milestone, can be read and understood independently. Taken as a

whole, this book is designed to explain how to take the lessons of DCT and insights from human capital thinking and apply them to the most important financial milestones in our lives—leaving you with fresh context for understanding and successfully navigating your own personal financial journey.

Introduction: Human Capital: Your Greatest Asset

Before you go any farther, I'd like to challenge you to complete a simple exercise. Ready?

Take out a blank sheet of paper, and draw a straight line right down the center, splitting the sheet into two equal parts. Now write “My Assets” on the top-left side of the paper and at the top right, “My Liabilities.” In the language of financial accounting, I am asking you to create a *personal balance sheet* that lists the value of everything you own and everything you owe.

On the right side of your personal balance sheet—which lists all your debts and liabilities—you should include the amount you owe on credit cards, consumer loans, mortgages, and anything else you relate to as a financial obligation. On the left side you should list the value of all your assets, including money in bank accounts, traded stocks, savings bonds, pension accounts, equity in a small business, the value of a car, and any other items of value you own.

Now, after you list all your assets and liabilities, add them up to get summary numbers. What is the value of everything you own, and what is the total value of what you owe?

Finally, subtract what you *owe* from what you *own*. The resulting number—whether positive or negative—is your *net worth*. Getting you to think about and then calculate this important number is the starting point for everything that follows in this book. Through this exercise, I want you to consider what you are truly worth in stark economic terms.

Now, you may have already done an exercise like this in the past. Perhaps you've created a personal or household net worth statement, and at this point, you're thinking that you aren't going to learn anything from this chapter (and maybe even the entire book) that you don't already know. Except hang on, because I'm about to tell you that *you probably did the exercise incorrectly and omitted the most important item and the most valuable asset you own*.

How so? Well, let's take a look at what happens when I ask my undergraduate business students to undertake exactly the same exercise.

As you've probably figured out by now, my day job involves teaching undergraduate and graduate business courses at York University in Toronto. My favorite subject to teach is a 12-week undergraduate course on the topic of wealth management. When I start this course anew each semester, on the first day of class, before I discuss the syllabus, the course textbook, or the final exam schedule, I ask each student to prepare their own personal balance sheet.

Now, their situations are probably different from yours. To start, they're typically only about 20 years old. But already, a large portion of them have substantial debt obligations: Many of them have taken out student loans in the range of \$10,000 to \$40,000. In this way, my students are like college grads in the United States, in which the average student loan balance was \$20,100 in 2007.¹ To be sure, these students might not need to pay back their loans for many years, and the loans might not be accruing any interest while they are in school, but all of them recognize their loans as liabilities with a current value.² My students also report having a substantial amount of credit card debt. On average, they report slightly more than \$3,100 as a revolving balance on their personal balance sheet. These numbers are broadly reflective of credit card indebtedness for that age category, according to Sallie Mae, a U.S. student loan company.³ However, unlike their student loans, on these liabilities the interest clock is ticking daily—and rates can approach 20 percent, and even 30 percent, for some bank and department store cards.

My students also often include consumer loans on their balance sheets because many of them owe money on cars they have financed or funds borrowed from roommates, parents, cousins, and the occasional loan shark. In sum: Most of them have plenty of debts and liabilities.

1. Reed, *Student Debt and the Class of 2007*.

2. In Canada, average student loan debt for a graduate with a bachelor's degree is \$22,800 (2007 Canadian dollars). Bayard and Greenlee, "Graduating in Canada."

3. From *How undergraduate students use credit cards: Sallie Mae's national study of usage rates and trends 2009*.

When they get to the left side of their personal balance sheets, they often admit to having difficulties finding any values to include. As you might suspect, at the age of 20 many of them don't have much in the way of traditional financial assets. They don't own houses. They don't have any stocks or bonds. They don't own any mutual funds, Treasury bills, or savings bonds, and they certainly don't have any pension accounts. Remember, some of these kids aren't yet of legal drinking age!

Some of my students include the little bit of money they have in a savings account at the local bank or perhaps the value of the bicycle they use to ride to class. In fact, sometimes a hand will go up, and a student will ask me if he should include the newly-increased credit limit on his MasterCard or Visa on the left side as a financial asset. (Note: The answer is no.)

Now, you can view this exercise—either the one I posed to you at the start of this chapter, or the one I give my new students each semester—as a rather private, possibly intrusive, and perhaps even depressing assignment. But as I am working through the creation of their personal balance sheets with my students, I make it clear that I do *not* want them to hand their sheets in to me at the end of class. I don't want to make them uncomfortable. I'm not trying to pry into their personal financial affairs. My goal, as I've said, is just to get them to compute what they think their net worth is by subtracting the value of the financial assets they have identified from the value of their financial liabilities—but they get to keep the resulting number to themselves, just like you do.

Is That Glass Half-Empty or Half-Full? Valuing Human Capital

When my students are done creating their initial balance sheet, I ask them two additional questions. You can think about the answers to these questions, too. The first is: *Do you think your personal balance sheet will look better ten years from now?* When I ask this question in class, virtually every hand goes up in response. My students are optimistic about their career prospects and hence their future personal balance sheet. I then ask, *How many of you got a zero or negative number for your net worth on the balance sheet today?* Be

honest now. Reluctantly, and slowly, the vast majority of the juniors and seniors raise their hands.

At this point, if they were a publicly traded company, with this admission of a zero or negative net worth number, they would immediately be deemed insolvent or even bankrupt. In fact, the smattering of students—from a group of 60—who do not raise their hands are usually exchange students (who perhaps didn't understand the exercise) or are the children of wealthy parents (maybe in Dubai?) who don't have any liabilities.

Now here's the twist: I then announce to my students that based on their responses it seems to me they did the exercise all wrong, and they probably answered both questions incorrectly. I tell them that I know they are relying on their previous studies of business accounting, using bookkeeping techniques or Financial Accounting Standards Board guidelines, to create their personal balance sheets. Much to their surprise, I suggest they are undoubtedly missing the most important item and most valuable asset class they own, and they are forgetting the reason they enrolled in school and have incurred all their student loan debt.

And now back to you—what my students have undoubtedly left off their list of assets is the same thing that's probably missing from yours—the value of what economists call *human capital*.

But what is human capital? At the young age of 20, as I've said, my students generally have little in the way of traditional financial capital. But they do have 40 to 50 years of salary, bonus, and wage income ahead of them. One powerful way to consider this future income is to view it as an asset like a gold mine or oil well with 50 more years of reserves.

Think of it this way: If you own a well or mine, you probably cannot extract more than a small fraction of the reserves in any given year. (And it might be very costly to do so.) However, *this asset has substantial value today*. I'll say this again to make sure it's clear: *The most valuable asset class for most people during most of their working years is their human capital*. Not just college kids in their early 20s or graduate students in their late 20s—this applies to you in your 30s, 40s, and even 50s and 60s.

Human capital should be viewed in exactly the same way as a gold mine or oil well: It has a tangible present value—right now—even if it takes many more years before you see six-figure cash flows from it. Accordingly, they should include the estimated current value of human capital to create what I call a *holistic personal balance sheet*. And I'm giving the same instruction to you. Although you might be slightly older than 20, your human capital is likely the largest asset on your personal balance sheet throughout most of your life.

Table I.1 shows how a holistic personal balance sheet might look.

TABLE I.1 Holistic Personal Balance Sheet and Net Worth Calculation

My Assets	My Liabilities
Explicit Financial Capital	- Visible Debt and Liabilities
+ Implicit Financial Capital ⁴	- Estimated Hidden Liabilities
+ Estimated Human Capital	_____
= Total Capital	= Holistic Net Worth

But how do you come up with an estimate of the value of your human capital?

To help my students arrive at a reasonable number, I give them a follow-up assignment to visit our campus alumni office or career center to collect data on how much people earn after they graduate from school. This information is also widely available online (on websites such as collegegrad.com), broken down by college major, geographical region, and sometimes even by school grades. As their second assignment, I ask my students to calculate the present value (that is, the value today) of the next 50 years of their total after-tax compensation, including wages, salary, and bonus.

Presto! My students come back to their next class a week later and joyfully declare that their human capital is currently worth millions of dollars. Indeed, even using conservative assumptions for

4. I define *Implicit Financial Capital* as the present value of all defined benefit pensions, Social Security (or Canada Pension Plan) benefits, and other illiquid entitlements to future cash flows that you can't sell or trade in the secondary market but that you have earned by virtue of your past labor market participation and are guaranteed to receive after retirement for your lifetime. My students, generally speaking, do not have any implicit financial capital—yet.

salary growth rates and discount rates, coming from one of the better undergraduate business schools in the country, their human capital values are well into the seven digits.

I've included a human capital calculator at www.qwema.ca, so you can try this exercise, too. What is your human capital worth? After you estimate and include your human capital, what does your holistic personal balance sheet look like?

Mark Yourself to Market

At this point, my students and you have learned lesson number one from this book, which I call *mark yourself to market*. If you worked through the calculations to estimate the value of your human capital, you have also learned to properly identify and sum the current value of all your future cash flows, and not just the financial assets you have today. In so doing, you have created a holistic personal balance sheet that takes into account both your explicit financial capital (the traditional financial assets you own today) and your human capital.

Let's take a closer look at valuing human capital. Using data provided by the Current Population Survey from the U.S. Census, I estimate that at the age of 25—with the potential of 40 to 50 more years of labor income ahead—the human capital of a college graduate (not necessarily a business student) can range anywhere between \$540,000 and \$1,700,000 on an after-tax basis.⁵ (These numbers are rough estimates based on a number of embedded assumptions,⁶ but they're in the right ballpark.) Ten years later, at the age of 35, that same college graduate has an implied human capital value between \$560,000 and \$1,600,000. At the age of 45 the range is \$500,000 to

5. In Canada, the median value of human capital at the age of 25 after completing an undergraduate degree is roughly \$1.3 million, assuming a discount rate of 3.5 percent. Data source: payscale.com; QWeMA Group calculations.

6. In generating these estimates, I included only income from earnings; I adjusted for tax using average 2008 effective tax rates; and I assumed income from employment to age 75. Lower estimates are based on 40th percentile income (only 40 percent of people have incomes lower than this) and a discount rate of 6 percent; upper estimates are based on 90th percentile income (90 percent of people have incomes lower than this) and a discount rate of 3.5 percent.

\$1,400,000, and—perhaps surprisingly—at 65 the remaining value of human capital is between \$160,000 and \$480,000.⁷ I want to underscore that these derived values are not formal measures of net worth and do not, as I've said, take into account any traditional financial capital, such as the value of pensions or Social Security entitlements. My human capital estimates simply represent the present (that is, discounted) value of the wages and income you can expect to receive during your remaining working years.

Using this methodology and data from the Bureau of Labor Statistics, I can provide estimates of human capital based on specific professions and for individuals who have more than a college degree. For example, at the age of 25, an average physician's human capital is worth approximately \$2.7 million, an average lawyer's human capital is worth approximately \$2.1 million, and an average civil engineer's human capital is worth approximately \$1.4 million. An average plumber's human capital is worth \$960,000, and an average baker's human capital (yes, the Bureau of Labor Statistics has a category for bakers!) is worth \$520,000. (You will have the opportunity to delve into these differences by occupation further in Chapter 1 ("Is the Long-Term Value of an Education Worth the Short-Term Cost?"), that looks at the true value of an education.)

Is This a Cynic's Value or True Worth?

Now, you might think it rather cynical to evaluate training, education, and lifelong learning in purely financial terms. In contrast, I believe the notion of human capital is ultimately a deeply encouraging one. For example, many of my undergraduate and graduate students find comfort in the notion that their holistic net worth contains this substantial hidden asset. I am also not the first or the only university professor to emphasize the importance and value of human capital. The most celebrated economist in the study of human capital is Nobel laureate Dr. Gary Becker, from the University of Chicago. He

7. See footnote #5 for the Canadian values.

popularized thinking about the value of education as an investment in human capital in his classic *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education*, first published in 1964. Moreover, the concept of human capital can be traced much farther back to the economist Adam Smith (1723–1790) in *The Wealth of Nations* and to Alfred Marshall (1842–1924) in *Principles of Economics*.

Interestingly, Professor Becker made the following comments in the introduction to an early edition of his famous work: “It may seem odd now, but I hesitated a while before deciding to call my book *Human Capital*, and even hedged the risk by using a long subtitle. In the early days, many people were criticizing this term and the underlying analysis because they believed it treated people like slaves or machines.” He went on to say, “My, how the world has changed! The name and analysis are now readily accepted by most people not only in the social sciences but even in the media.”

An Appreciation That Grows with Age

Over the years, in addition to introducing my 20-year-old students to the holistic personal balance sheet, I have also presented this concept to older executives, MBA students, and general audiences made up of people in their 40s and 50s. Most were enthusiastic and accepting of this way of thinking about the value of human capital, although some were not. One objection I have heard, especially from those in traditional business accounting disciplines, is that human capital shouldn’t be placed in the same category as financial capital—as (despite my fondness for the analogy) it isn’t an oil well or gold mine that can be sold today for a known sum. These skeptics object to human capital—which is uncertain future earnings—being awarded a place on the personal balance sheet. After all, the critics claim that human capital can’t be securitized, sold, or traded, so how can it be treated in the same way as tangible stocks and bonds?

To audiences who argue against the human capital and holistic personal balance sheet approaches—especially people in their middle working years—I pose a question in response, to wit: *How much of your financial capital would you be willing to give up, today, to turn back the clock a few decades and get back your old human capital?*

How much money would you be willing to pay, right now, to become 20 years younger? Most of it? All of it? Many, if not most of the skeptics say they would be willing to pay quite a lot indeed to regain some years of youth. Well, I reply, if you are willing to sacrifice so much financial capital at advanced ages to regain lost human capital, then it must be worth quite a bit at early ages!

The Nine Milestones

What does human capital have to do with financial milestones and financial decisions? Throughout your lifetime, as you reach what I am calling different “money milestones,” to make good decisions you must understand the hidden assets and hidden liabilities on your holistic personal balance sheet. Going to school, getting married, having children, buying a home, buying insurance, filing your income tax each year, planning for retirement, making decisions about pensions—all of these milestones affect your holistic personal balance sheet.⁸ The concept of human capital, as the largest and most valuable asset class for most people over most of their lifetimes, is probably the biggest single factor that you must, in my view, appreciate and include in your personal financial planning across your lifespan. Accordingly, this book takes human capital thinking and applies it to nine major financial milestones you can expect to grapple with in your life.

Now, I’ll be the first to admit that the number 9—which appears both in the title of this book and is the number of chapter topics to follow—is both debatable and subjective. In fact, my perceptive wife claims I first plucked this number straight out of thin air and then labored to identify topics that added up to the said 9. And, although I won’t admit to such extreme arbitrariness, I’m open to the argument that there might be only 7 or possibly as many as 12 important financial milestones over the course of your life. However, quibbling about whether there are more or less than 9 is not what this book is about.

8. In my previous book, *Are You a Stock or a Bond?* (also published by Pearson/FT Press, 2009), I addressed the narrow implications of human capital on investment portfolio management. In this book, I expand this thinking to all the major financial decisions in your life.

Truthfully, the nine topics I identified are far from homogenous in decision structure or actually even comparable to each other in economic magnitude. Some topics, such as marriage—which I examine in Chapter 4, (“Are Kids Investments and Can Marriages Diversity?”)—have psychological and sociological dimensions that reach far beyond financial aspects. Furthermore, the typical marriage decision itself takes place once, twice, or maybe a handful of times over the course of the human life cycle (okay, two handfuls in the case of Elizabeth Taylor). In contrast, other decisions such as investment and portfolio management—which are reviewed in Chapter 8 (“Portfolio Construction: What Asset Class Do You Belong To?”)—are primarily financial in nature and take place continuously in time. Can all of these milestones really be lumped together?

The purpose of highlighting these nine milestones is not to disregard or disrespect the nonfinancial elements in our lives and decisions *but rather to illuminate the often-obscured monetary implications*. The unavoidable truth is that children are expensive to raise and can place a strain on the family’s finances; initially sound marriages can fail as a result of financial difficulties; and people can experience long periods of unemployment if they don’t have proper career training—or if they overinvest in an education that doesn’t increase the value of their human capital. In short, ignoring the monetary implications of our decisions can lead to financial regret.

Money Milestones over Your Lifetime

Whatever starting point you are coming from—whether you have already been converted to my way of thinking about human capital, or you plan to evaluate the concept as you move along—this book is designed to get you to think more broadly about your holistic balance sheet. I illustrate how the four basic principles of arithmetic—addition, subtraction, multiplication, and especially division—can be used as a guide for approaching all the money milestones in your life.

So far, I have talked about the value of human capital at specific points in time—such as my hypothetical physician’s, engineer’s, or baker’s human capital value at the age of 25. However, another critical thing to understand about human capital is that it is *dynamic*—its value changes over time. (And it can also be changed by providing

inputs such as higher education, as you shall see in Chapter 1, on investing in human capital through higher education.) And as you know from the examples I have provided to date, the value of your human capital generally decreases with age, as the number of years you intend to work decreases.

Accordingly, as you age, and your remaining human capital value declines, you should be converting or transforming your human capital into traditional financial capital by saving a fraction of your wages and income. This saving process is critical to meeting your money milestones effectively, and I address the question of “How much is enough?” in Chapter 2 (“What Is the Point of Saving Money Forever?”).

Marriage and children can also have profound impacts on your holistic balance sheet, both positive and negative. I discuss the decision to marry and the decision to (and the cost to) have children in Chapter 4. Typically coincident with decisions about marriage and children are decisions about home ownership. You look at that issue in Chapter 6 (“Can You Eat Your House or Will It Ever Pay Dividends?”), along with the related topic of borrowing money in Chapter 3 (“How Much Debt Is Too Much and How Much Is Too Little?”). The value of human capital must also be protected, especially earlier in life—which is where life, disability, health, and critical illness insurance (all of which I discuss in Chapter 7, “Insurance Salesmen and Warranty Peddlers: Are They Smooth Enough?”) come into play. As you save a fraction of your earnings, you need to make sure you pay as little tax as needed—to retain the maximum value—and this is a theme of Chapter 5 (“Government Tax Authorities: Partners, Adversaries, or Bazaar Merchants?”).

Finally, as you near the end of your working years and arrive at what is traditionally referred to as retirement, the value of your human capital inevitably declines in value. At this stage, the bulk of the assets on your personal balance sheet should consist of the financial capital you have acquired. The conversion of your human capital to financial capital to sustain you in your nonworking years is, of course, the reason why retirement planning is so important. You cover this topic in Chapter 8 (on investing financial capital) and Chapter 9 (on creating income streams in retirement).

Summary: The Four Principles of Arithmetic in Action

- This book will use four basic principles to understand and evaluate your financial decisions through all the significant milestones in the human life cycle.
- To apply the four principles effectively, you need to **ADD** the true value of your financial capital and human capital together. That is your net worth.
- After you add your human capital to your holistic personal balance sheet, make sure to **SUBTRACT** all your liabilities to finally arrive at your economic resources.
- **DIVIDE** your total economic resources evenly and smoothly over your lifetime. **MULTIPLY** all the possible universes you might encounter in the future and act to smooth resources across all of them.

The four bullet points might not make much sense to you at this point, but I promise it will all click in a few chapters.

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Is the Long-Term Value of an Education Worth the Short-Term Cost?

One of my rather bright undergraduate students from a few years ago, who stayed in touch over the years, decided after some years in the labor force to invest (more) in her human capital by returning to graduate school. She wanted to get a master's degree in advanced mathematical finance. I encouraged her to look broadly and consider all the top schools around the world. After a grueling application and admissions process, she was finally accepted to one of the best graduate schools, which happens to be located in the U.S. Midwest. This was quite an achievement for her, and I suspect her acceptance letter has been framed for posterity.

Unfortunately, a few weeks after the good news came in the mail, she got a follow-up letter from the school with the financial details and a huge invoice. She was facing a total cost of almost \$80,000 for a graduate education that takes less than two years to complete. (She probably didn't want to frame the invoice.) And although she understood that this was a great investment in her human capital, at the same time, she didn't have \$80,000 sitting in a bank account ready to be withdrawn. Furthermore, this was a full-time, intense program that would limit her ability to earn any outside labor income while she was in school. So, like most prospective students, she began investigating various private loans through banks and organizations such as Sallie Mae and government-run student loan programs such as the Federal Direct Loan Program. The paperwork was daunting, the money wasn't free, and she started having some doubts. Was \$80,000 in additional debt really worth it? After all, she was still paying off some of her undergraduate student loans.

Investing in a Gold Mine...Called Anastasia

When I found out about the dilemma she was facing—and the possibility she might abandon her educational plans—I offered Anastasia (*not her real name, obviously*) a deal, which I will outline here. I knew she was a bright and hard-working student who would do extremely well in graduate school and complete the program in the top of her class. My estimate was that she would then go on to a successful career in the financial services industry and likely earn thousands of dollars a year in salary and bonus. In my view, she had the potential of a high-producing gold mine or oil well, and I personally wanted the opportunity to invest in her human capital. So, I offered her \$50,000 in cash—to finance the majority of her tuition—in exchange for a mere 10 percent of her pretax earnings during the first ten years after she graduated. To my way of thinking, the money I offered wasn't a loan or any type of debt. It was an investment. As long as she was in school, and wasn't earning any money, she owed nothing. I invited her to think of this as accepting a slightly higher tax rate in the future in exchange for a deeply subsidized education today.

Should We Allow Human Capital Derivatives?

As you saw in the Introduction, “Human Capital: Your Greatest Asset,” investing time and money to develop your human capital pays off on average. But the dividends and investment returns—especially given student loan interest payments—might be less than in previous years, as the cost of investing in human capital (getting a college degree) continues to increase faster than inflation (as measured by the consumer price index, or CPI).¹ This is especially true for elite private colleges and universities, in which tuition has risen the most and the fastest. College graduates in aggregate have more student loan debt than ever before and are entering the labor force with

1. University tuition fees have risen faster than inflation over the past decade in both Canada and the United States. For U.S. data, see Baum and Ma, *Trends in College Pricing*. Canadian data taken from Statistics Canada, “The Daily: University Tuition Fees.”

thousands of dollars in balance sheet liabilities, well before they have taken out their first mortgages.

According to an article in the *Wall Street Journal* on September 3, 2009, today, almost two thirds of all college students have borrowed money to pay for their tuition; their debt load upon graduation is an average of slightly more than \$23,000.

Is there an alternative? I think so.

Here's what I'm thinking: Perhaps there will come a day in the not-too-distant future when current and future students can sell a fraction of their (extraordinarily valuable) human capital when they are young to finance the costs of investing in education and going to school. These young students would get a lump sum of cash in advance or, alternatively, spread out over their years in school. These sums would not be considered a loan, or "bond-like." Rather, the funds would be considered "stock-like"—that is, similar to a company or a small business issuing shares (via an IPO or seasoned equity offering) to finance its expansion and investment opportunities. The money would be repaid by the student, eventually, in the form of preferred dividends for a predetermined period starting after graduation. I'm calling this concept *Human Capital DerivativeS* (HuCaDS), or, with tongue in cheek, *Human Capital Daddy of Sugar*.

Here's how I figured the math. When Anastasia graduated in approximately 24 months, I anticipated she would be earning at least six digits—given her previous experience and the typical salary structure for specialists in her field. And, even if her salary remained constant at \$100,000 per year (pretax) for the next ten years, that would yield me \$10,000 for ten years on an initial investment of \$50,000. To analyze this more precisely, I calculated something called the internal rate of return (or IRR) in my Excel spreadsheet program. A cash outflow of 50,000 today followed by zero cash flows for two years (while she is in school) and then by a positive cash flow of \$10,000 from years 2 through 12 represents an annualized return of 10.25 percent. That investment return is much better than the rates at my local bank.

In fact, this deal could turn out even better for both of us. Let's imagine that Anastasia performs better than expected, and by her fifth year back in the labor force, she is earning \$200,000 per year. So, for the first five years I would receive \$10,000 in dividends and for the

remaining five years of our HuCaDS agreement, she would be sending me \$20,000 each year to pay back my investment. That works out to an internal rate of return—for me—of 15.2%. This is better than you can hope for even in the most irrational of stock market bubbles!

Of course, my HuCaDS arrangement would also leave me exposed to some downside risk as well. Anastasia might decide to shelve her completed master's degree and backpack across Europe or India for five years after graduation, which might satisfy her lifetime ambition to travel the world but would generate zero dividends for me. In that case, her return to the labor force would leave me only five years of cash flows in the contract term. Alternatively, she might decide to join the U.S. Peace Corps—or take a minimum-wage job at McDonalds paying only \$25,000. Then the internal rate of return from my \$50,000 investment would be zero, or possibly even negative. In those cases, I would have been better off putting the \$50,000 under my mattress than investing in a HuCaDS with Anastasia. That is the risk and return trade-off for me: On the upside, I can get returns in the double digits—and on the downside, I could lose it all. Now I obviously would invest only a small fraction of my total net worth in human capital derivative arrangements, but at the same time, I would also derive some psychic dividends from having helped finance a student's education.

I mention this (true) story because I think it could serve as an alternative for future students to onerous and anonymous student loan debt, with potentially crushing interest payments. In my teaching career, I see firsthand how current levels of student loan debt force people into jobs and careers they don't want or like, simply because they have to make the loan payments. My HuCaDS proposal would enable graduates to accept any job they truly want, knowing that they owe only a floating fraction of their salary as opposed to a fixed and unyielding obligation, as with a student loan.

Securitizing Human Capital

Now, I am not the first person to think about securitizing human capital. (Securitization is the process by which a cash-flow-producing asset is repackaged as a security and sold to investors.) This concept

can be traced back to the well-known economist Milton Friedman in an article titled, oddly enough, “The Role of Government in Education.”² This concept has also more recently been advocated by Miguel Lleras in his book *Investing in Human Capital*. Friedman, Lleras, and others have pointed out some of the potential pitfalls in programs that attempt to securitize human capital. For example, how do you enforce payment? What happens in the event of a student’s bankruptcy? Can these payments be considered tax-deductible from income, like corporate debt? Does such an arrangement risk being labeled usurious (that is, charging exorbitant amounts of interest) if income payments far exceed the initial equity investment? As with any ambitious plan, the details have to be ironed out. But I think the idea itself has merit and should be considered, at least on the individual level.

In the next few sections you will see how the decisions about where to go to school, how much time to spend learning, and what to study can together have a huge impact on the valuation of your human capital. Here’s what I mean in practical terms: Two 25-year-old graduate students sharing an apartment might both have little in the way of financial capital, real liquid assets, or income. Their traditional accounting balance sheets likely display a negative net worth. Yet, depending on their chosen courses of study, their holistic balance sheets can look *completely different*. One might have a human capital worth millions of dollars, whereas for the other it might be measured in hundreds of thousands or even less. Moreover, as you will see from the discussion of the net worth and financial and asset holdings of college graduates, not only might their earning power be different, but the types of assets they are likely to hold in the future can also be quite different, which has yet other implications I explore in later chapters. Because I thought you might like to calculate the impact of an investment in human capital on your personal balance sheet, I have created a calculator at www.qwema.ca that enables you to project the payoff from an investment in human capital, based on your age, expected investment in education, and expected increase in income.

2. In Robert A. Solo, ed., *Economics and the Public Interest*.

In short: Education decisions have deep and persistent impacts on your financial situation for the rest of your life span, and those impacts are not necessarily obvious at the outset of your educational path. The undergraduates I encounter in my personal finance course have already made the decision to attend college, and they've already (for the most part) chosen their course of study. This chapter is designed to get my thinking about the impact of education on human capital into the hands of a bigger audience—so you or your kids, too, can properly estimate and add the value of investing in human capital to your personal balance sheet.

Using the metaphor of Dynamic Control Theory (DCT), education is one of the variables that impacts your financial well-being and that is controllable. (You can control how much you get!) In a life filled with uncertainty, there is robust evidence that educational attainments pay off over time, and that they can set you up to achieve far greater wealth than you might otherwise.

Are College Graduates Truly Wealthier?

In the introduction, I mentioned that I ask the undergraduate students in my personal finance course two questions. The first (optimistic) question is whether they think their personal balance sheet will look better in ten years' time than it does now. The second, seemingly more pessimistic, question asks whether their present net worth is zero or even negative. The introduction to this book is largely focused on uncovering the true, but hidden, answer to that second question. As you now know, invariably, when their human capital is included, my students are wealthier than they first thought—as are you.

But if you accept the concept of human capital as the most valuable asset class on your personal balance sheet for most of your working life, you also must accept that this is a resource that is depleted over time. That is: The flip side, or corollary, of the optimistic “You are wealthier than you think” message is that if you don't save an appropriate proportion of this wealth—that is, the dividends you reap from your human capital—then you might find your total personal balance sheet to be in *worse*, not better, shape as you age. Remember, with each passing year you have one less year of proven reserves to draw on (returning to our

oil-well metaphor). Furthermore, if you take on a disproportionate amount of student loan—or other—debt relative to the income you can expect from your chosen career, your holistic balance sheet might actually shrink over time. Accordingly, decisions about education do not just influence us at the point they are made but can affect the value of our human capital for the remainder of our lives. Indeed, education decisions are some of the most important milestones you will face in life.

So, let's take a closer look at the income, net worth, and personal debts of college graduates and compare them to high school graduates, all to get a better sense of how the education decisions you make impact your human capital. We'll conclude with some suggestions about how best to finance college education, the increasingly expensive investment in human capital.

The Best-Paying Careers?

For many previous generations, and in the eyes of many economists until about a half-century ago, paying for higher education was not considered an investment but rather a consumption good such as an expensive suit, car, or set of golf clubs: It might make you feel better about yourself but didn't necessarily have an investment value. Today most people would agree that financial returns to education can be quite substantial. That is, money spent on college education is generally perceived much more like an investment that will pay dividends well into the future. According to estimates by the International Monetary Fund and the World Bank, the private return to education—what the individual college student can expect to gain—is between 20 percent and 30 percent and the social return—or what society gains from investments in post-secondary education—is from 10 percent to 20 percent.³ The lesson is clear: Investing in human capital pays dividends. But the question of how much is paid out depends significantly on your choices about post-secondary education. How so?

According to a May 2009 cover story in *U.S. News and World Report*, the median national pay for a hairstylist is \$33,700 per year.

3. As reported in Lleras, *Investing in Human Capital*.

In contrast, an optometrist earns a median \$99,700, which is three times as much as the hairstylist.⁴ According to the story, the employment outlook for both professions is good, and despite the pay gap, both groups report high job satisfaction. Now, guess which one of these two professions requires more effort, education, and training? Yes, the optometrist. You can probably work as a successful hairstylist with barely a high school diploma (or less) and a short training period. In contrast, to become an optometrist requires an O.D. degree, which means, in turn, that you need to spend four years and beyond in college.

The gap between the expected incomes of a hairstylist and an optometrist, and between the years of study required for each profession, provides an important lesson in the economics of the development of human capital. Unlike most forms of financial capital, you can't actually inherit human capital, win it in the lottery, or stumble across it in an antique sale. Most people have to work hard and invest time and effort in nurturing their human capital. In general, the more you are willing to invest in human capital—in terms of time, money, and effort—the greater the financial payoff. More important, when you “mark-to-market” the holistic balance sheet of two 25-year-olds, one studying to be a hairstylist and the other an optometrist, the human capital value of the optometrist is more than three times as great as that of the hairstylist. I estimate that the optometrist's human capital is worth approximately \$1.8 million whereas the hairstylist's is worth \$0.6 million.⁵

Minor Initial Differences Magnify over Time

As you can see, even a small difference in annual wage income can lead to enormous differences in the holistic balance sheet over time. This point was emphasized in a study of college majors discussed

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4. Using Canadian data from Payscale.com, median salaries are estimated at \$99,300 for an optometrist and \$26,000 for a hairstylist in Canada.
 5. Using Canadian data from Payscale.com and QWeMA Group calculations, I estimate a Canadian optometrist's human capital value at \$2.1 million, compared to \$0.5 million for a hairstylist in Canada.

in a recent issue of *Forbes* magazine.⁶ According to data from the website PayScale.com and published in *Forbes*, a college graduate who majored in English and had less than five years of experience earned a median wage slightly less than \$40,000 in 2008. An English major with 10 years to 20 years of experience earned approximately \$60,000 per year. Thus, roughly speaking, the premium for experience was \$20,000 per year.

In contrast, according to the same survey, a mechanical engineering college grad with less than five years of experience earned a median \$60,000 in 2008, which is approximately \$20,000 more per year than the English major. Furthermore, the mechanical engineer with 10 years to 20 years of experience earned a median \$90,000 in wages. The experience premium in this case is \$30,000 per year.

Thus, I would argue that the human capital of a mechanical engineer who is just about to graduate is (much) more valuable than the human capital of an English major for two reasons: First, the engineer's initial wage out of college is greater than the English major's, and secondly, the premium she will be paid for the experience she builds over time is higher as well. Thus, the present value of the after-tax wages for the two graduates over the estimated 40 years of income is greater. For the English major I estimate it is \$1 million and for the mechanical engineer it is \$1.5 million. (Now, wouldn't it be useful to know this as you contemplate college majors?) Stay tuned for more insights into how education decisions affect wealth-building over time.

How Investing in Human Capital Pays

One of the common questions I get from eager young students who drop by my office is what they should major in or study at school. Some pose this as an existential, big-picture question: "What should I do with my life?" Others phrase it as a more targeted question: "I want to work in the investment industry. So, am I better off taking advanced managerial accounting or advanced derivative pricing?"

6. Badenhausen, "The Most Lucrative College Majors."

Despite what I've already said about varying pay scales by profession, and keeping in mind I am most definitely not a guidance counselor, my answer is usually as follows: First, figure out what you truly enjoy doing. A good way to do this is by taking as many different courses as possible. Then, when you find what you like, find out how to make money doing that. Although the answer might not satisfy them, this little piece of advice was given to me by my father many years ago, and it has worked out well for me personally. Although I've just spent the last few pages talking about the financial impacts of education decisions, the bottom line, for me, is that human capital estimates should form only part of your decision about what career to pursue. (However, I do think they should form at least part of your deliberations.) Somebody who truly wants to be a hairstylist but who decides to pursue a career as an optometrist because it pays three times as much will likely have a higher human capital value than they otherwise would—but they are also much more likely to be miserable!

I'm sure these remarks will sound odd if you worry about your kids who just love playing video games...or sleeping all day. Surely figuring out what you enjoy is not the best strategy for increasing the value of human capital, is it? Shouldn't professors be telling students to "aim high" and go to medical school or become engineers or lawyers?

Oddly enough, additional research—beyond what I've already reported—provides some subtle reasons for the discrepancy between the net worth of people with and without higher education. That is, the gap in net worth between people with a college degree and those with a high school diploma or less is attributable to more than just educational achievement. How so? Let's explore this question next.

First, let's start by examining actual household balance sheet values as estimated and reported by the U.S. Federal Reserve, as opposed to the theoretical estimates I have been giving for human capital (see Table 1.1).

Here are some basic facts. According to 2007 data collected by the U.S. Federal Reserve in its Survey of Consumer Finances,⁷ the

7. The SCF is a triennial interview survey of U.S. families sponsored by the Board of Governors of the Federal Reserve System with cooperation of the U.S. Department of the Treasury. In the year 2007 survey, 4,422 families were interviewed. See Bucks et al, "Changes in U.S. Family Finances from 2004 to 2007" for more information.

TABLE 1.1 Does Education Pay Dividends?: Federal Reserve Board Survey of Consumer Finances 2007

Education Level (Head of Household)	Percent of U.S. Population in Group	Average Pretax Household Income	Average Household Net Worth	Median Household Net Worth
No High School Diploma	13.5%	\$31,300	\$142,900	\$33,000
High School Diploma	32.9%	\$51,100	\$251,600	\$80,300
Some College	18.4%	\$68,100	\$365,900	\$84,700
College Degree	35.3%	\$143,800	\$1,097,800	\$280,800

average net worth of U.S. college graduates is much larger than the net worth of individuals who don't have a high school diploma, or who didn't attend college. For example, in the year 2007, the average net worth of a family in which the head of the household has a high-school diploma only—and did not go on to college—was \$251,600, whereas the average net worth for a college graduate was almost four times greater at roughly one million dollars. For those without a high school diploma, the average net worth was a mere \$142,900.⁸ (Note that all these numbers use the conventional accounting measures of net worth—namely explicit financial assets minus explicit financial liabilities—and don't take into account the human capital value I previously discussed.)

Human Capital Investments over Time

No matter how you report the statistics, one thing is quite clear from the data: A college education—which is an investment in human capital—is statistically associated with greater net worth and greater

8. These patterns are seen in Canada as well. Median net worth for households with less than a high school diploma was \$92,433 in 2005; with a high school diploma was \$120,007; and with a university degree was \$237,400. From Statistics Canada, *The Wealth of Canadians*.

Detour: Averages Versus Medians

Before you go any further, I want to take a minute to review the difference between *averages* and *medians*. (If this distinction is already familiar to you, skip ahead.) Note that the numbers you've been reviewing on net worth are simple averages (also known as the *statistical mean*). Averages can be distorted by large values (for example, Bill Gates or Warren Buffet pulling the average earnings up). Another measure of the middle or expected value of a data set is the *median*. The median net worth is more robust than the average (that is, not as sensitive to outliers such as Buffet or Gates) because it identifies the point at which 50 percent of the population has a net worth above these numbers and 50 percent are below. Just to be sure this distinction is clear, think of the series of numbers: 2,10,9,2,4,7,1,1,3,7. If you add them up and divide by 10, you arrive at a mean or average value of 4.6. On the other hand, if you rank them from highest to lowest, the mid-point, or median value, will be between 3 and 4. In general, for the same group of numbers, the *average* and the *median* can be quite different. If, for example, the numbers I've just given represented average and median earnings of a group of people, the difference would be quite large.

income. As you can see from Table 1.1, the household headed by a college graduate had an average income of \$143,800 in the year 2007 versus \$51,100 for those who completed high school—and just \$31,300 for those without a high school diploma.⁹ (One of the first economists to demonstrate this was Columbia University professor Jacob Mincer in his 1974 book *Schooling, Experience and Earnings*.)

As you might suspect, these multiples were not just limited to the year 2007. The gap is consistent across time. Eighteen years earlier, in

9. This finding holds true in Canada, as well: average earnings for those with less than a high school diploma were \$21,230 in 2001; those with a high school diploma earned \$25,477 annually; and those with a university degree earned \$48,648 annually. From 2001 census data as reported in Statistics Canada, *Earnings of Canadians*.

1989, the average net worth of college graduates was \$672,400 whereas the equivalent number for high school graduates was \$200,900. Notice that over that 18-year period the average net worth of college graduates increased by almost 63 percent—from a value of \$672,400 to \$1,097,800—whereas the average net worth of high school graduates increased by only 25 percent. (These amounts are all given in 2007 dollars, which means they are already inflation-adjusted. That is, the gap is not a function of inflation.) Indeed, this appears to provide yet more evidence of the long-term benefit that accrues from investing in human capital: Your net worth is both higher and increases faster. However, the reasons are more subtle than you think.

College Grads Learn to Buy Different Assets

It seems that U.S. college graduates are wealthier partly because they own different types of physical assets and financial investments. And it is these underlying components of net worth—which are quite oblivious to the education level of their owner—which have increased in value, which leads to an increase in net worth. For example, according to the same Survey of Consumer Finances data you previously saw, in the year 2007 more than 31 percent of college graduates owned stocks (directly), and 21 percent held investment funds. In contrast, only 9 percent of those with a high school diploma reported holding any stocks (directly), and only 6 percent had any investment funds.

A similar pattern emerges with nonfinancial assets such as real estate. For example, in the same 2007 survey, 78 percent of college graduates reported owning a primary residence, whereas only 53 percent of individuals without a high school diploma owned a primary residence. For high school graduates the ownership rate was 69 percent. Even more noteworthy is the median value of the houses owned by the various educational groups: The median value of the college graduate's primary residence was \$280,000. For the high school graduate it was \$150,000, and for those without a high school diploma it was \$122,500.

What you can see is that the college graduate's higher net worth is allocated to a portfolio of assets that are quite different from those in the other groups who have less education. In aggregate, college graduates have more financial investments, and they own houses that are more expensive. Now, think about what happened to the value of the stock market, mutual funds, and housing prices during the period 1989 to 2007; they went up quite strongly. The SP500 increased by 659 percent from January 1989 to January 2007, whereas the value of housing—as measured by the S&P/Case-Shiller Home Price (Composite 10) index, which provides data on single-family house prices in the United States—increased by 187 percent over the same 18 years.

So, perhaps the reason college graduates are wealthier than high school graduates is because of what they “learned to buy” while in college, as opposed to their earning power *per se*. In the words of the author of a recent study on the same topic, “Assets more likely held by college graduates appreciate faster than assets held by high school graduates.”¹⁰ This insight is also echoed in a Harvard Business School working paper in which the authors examine the impact of financial education on financial market participation and find that cognitive ability, which is arguably improved by attending college, increases the odds of holding financial assets such as stocks and bonds.¹¹ Of course, these same assets can become a double-edged sword because they are more volatile than other kinds of assets, and this volatility is not under their individual owner's control.

What you've seen so far is that households headed by individuals with more education tend to have higher incomes and higher net worth. The higher net worth comes in part because college graduates hold different assets than those owned by households with lower levels of education, and these components of net worth appreciate more quickly. But you also know that the assets held by households with higher education levels fluctuate in value more than those held by other households. Does this mean that college graduates might become worse off, over time, than other households with less education?

10. Yamashita, “Keeping up with the Joneses in McMansions.”

11. Cole and Shastri, “Smart Money.”

Could the Fortunes of College Graduates Wane?

Let's take a closer look at the Survey of Consumer Finances (SCF) numbers on household assets. We'll focus on two groups: the college graduate household (which represents 35 percent of the U.S. population) and the high school graduate household (which represents 33 percent of the U.S. population).

Recall that college graduates are more likely to be homeowners, and the value of their principal residence is higher as well. The college graduate owns a home with a median value of \$280,000 whereas the homes owned by high school graduate households have a median value of \$150,000. (All these are 2007 numbers, which is well before the housing mini-crash of the last few years.) More important, let's examine the debt and mortgages college and high school graduates have on those houses.

According to the SCF data, 62 percent of college graduates report having a mortgage secured by their primary residence, versus 45 percent of the high school graduate group. In addition, the college graduate has median debts of \$124,000 versus only \$40,000 in debt for the high school graduate group. The college graduate has more than three times as much debt as the high school graduate, including mortgages, installment loans, credit card debt, and other unsecured lines of credit. So, although the college graduate net worth is much higher than the high school graduate, their (traditional) balance sheet looks different as well. They have both *more assets* and *more debt*. Moreover, the assets they own are more susceptible to fluctuations in the market prices of real estate and stock markets.

So, will the college graduates be (that much) better off in the future? Or might the increased volatility of their financial and real estate holdings potentially pull their net worth down? Or perhaps the relatively safe investment in education enables college graduates to take more investment risk with their traditional financial capital—because they're invested more heavily in an asset class (human capital) that stands to pay dividends over a long period of time, they are set up to assume more risk with the rest of their (financial) assets. Right now,

the questions I'm posing have no firm answers. My intention here is to illuminate some of the surprising financial impacts of a college education—impacts that I think are worth considering when contemplating education decisions. The rest of this book guides you through protecting your wealth as you move through money milestones, including how to assess and adjust the amount of financial risk you take on.

The SCF includes some other interesting statistics about the value of human capital. It turns out that people who are classified as self-employed, as opposed to working for someone else, report both greater income and much greater net worth. In 2007 the self-employed household reported an average net worth of almost \$2,000,000 compared to only \$350,000 for those who work for others. This means that Americans who are their own bosses are six times wealthier in conventional net worth terms than those who are employees—and they may be happier, as well, given their increased work autonomy. It is likely that one of the reasons for this discrepancy in net worth is that the mean reported household income for the self-employed is more than double that of those who work for others: \$191,000 versus \$83,100.

Does the Ivy League Pay Greater Dividends?

So, now that you know that higher education pays dividends, you might wonder whether the particular kind of college education you get makes a difference to how much you can earn over your lifetime. Is there a premium for an Ivy League education?

When my eldest daughter was born, more than 15 years ago, the first word I wanted her to learn—before the conventional *mommy* or *daddy* or *bottle*—was Harvard. I would buy her cute little shirts with Harvard logos; sweatshirts with Harvard emblazoned on the front; Harvard cups, mugs, key chains, and more. Then, when she was no more than seven or eight years of age I took her with me on a business trip to Boston and we visited the campus. (It was freezing and pouring rain all day. She hated it.) As you can tell, I was *just a little obsessed* with the idea that she should go to Harvard.

As my other children were born—I have four daughters in total—I taught them the words *Yale*, *Stanford*, and *Princeton*, in that order. In my mind, they were destined for the Ivy League with all the rewards and benefits this education brings.

Then I got real.

The cost of one year's (undergraduate) tuition at Harvard is now \$33,700. At Yale, the number is \$35,300. These numbers are not anomalies: The average cost of tuition at a private university (in the United States) is approximately \$25,000 per year. And these amounts don't include another \$15,000 or so in annual living expenses and other fees. In contrast, the average cost of state university tuition is a mere \$6,600 per year. Now compare these costs (five to seven times more for Ivy League versus state college) to data published by Payscale.com, which indicate that the median starting salary for an Ivy League college graduate ranges from \$56,200 to \$66,500. This not much more—between about 7 percent and 21 percent more—than the median starting salary of \$52,400 reported for the top state schools. At first glance, you might wonder if an Ivy League education is worthwhile. If you pay five to seven times more for tuition at an elite private college, shouldn't you earn five to seven times more right out of the gate?

However, research does tend to support the notion that it pays off (literally), over time, to attend an elite private college. In a report published by the National Bureau of Economic Research in the United States, the authors examined this specific question.¹² Analyzing the payoff of attending Ivy League and other colleges is not as easy as you might think. Clearly, some graduates from Harvard and Yale are unemployed (or volunteering at the Peace Corps), and some graduates from the lowest-ranked state schools make millions of dollars playing professional basketball or football. Accordingly, studies of the earnings over time of graduates from Ivy League and state colleges focus on averages and medians.

How do these studies measure the quality of schools, and how do they measure the earnings of students from different schools over time? First, to gauge the relative quality of different colleges, our

12. Brewer, Eide, and Ehrenberg, "Does it Pay to Attend an Elite Private College?"

researchers used library budgets, the SAT scores of entering freshman, and the number of faculty per student. (Generous library budgets, high SAT scores, and lots of faculty per student drove the rankings up.)

Then, to investigate the earnings over time from graduates of different colleges in the United States, the researchers used results from the NLS 1972 dataset, which is conducted by the National Center for Education Statistics. This data contains detailed family and schooling characteristics for various cohorts of students: 21,000 students who graduated high school in 1972 and an additional more than 10,000 who graduated in 1980 and 1982. These groups were interviewed 6, 10, and 14 years after they completed high school, so the researchers extracted quite a bit of information on the relation between college quality and earnings, among a number of other variables.

Their results were conclusive and robust. The researchers concluded “There is a large premium to attending an elite private institution and a smaller premium to attending a middle-rated private institution, relative to a bottom-rated public school.” They also noted that their analyses suggest the return to elite private colleges “increased significantly for the 1980s cohort compared to the 1970s cohort.” As this research was conducted more than ten years ago, it will be interesting to see if a trend develops, and the 1990s cohort—people graduating from high school in the 1990s—does even better than the 1980s cohort does.

Yet, despite all the positive evidence, the authors were careful to end their study by saying: “We do not attempt to determine the cause of this change, but it is a potentially important finding in light of the large tuition increases concentrated at these institutions during the past two decades.” In other words, although the authors could not pinpoint the specific reasons for the “large premium” accruing to graduates of elite private colleges relative to graduates of middle- and bottom-ranked schools, they suggest the high tuition and significant tuition increases at elite schools might be offset by later financial gains to the graduates of these schools. Keep in mind, too, it is not just the earnings and wages that are higher for (elite) college graduates—as you have explored, their personal balance sheets look quite different as well.

Distinct Groups of Students—And “Fun Capital”

Either way, it does seem that to afford tuition—whether at expensive private schools or not—students are incurring a substantial and increasing amount of debt. The average amount of debt held by a typical undergraduate rose from \$16,000 in the early 1990s to \$20,100 in 2007 (all reported in constant 2007 dollars). Just recently the *Wall Street Journal* reported that it has reached \$23,000 in 2009.¹³ Although these numbers might seem relatively low to those earning many times that amount in one year of work, I know from my own years teaching at a university that some students are taking on much more than this average amount of debt to make it through with a degree—and the bulk of students do take out loans to finance their education. According to the Annual Survey of Colleges, approximately 60 percent of undergraduate students graduate with some student loan debt and this number might be as high as 70 percent for 2010.¹⁴

But what of the 40 percent with no debt? Perhaps some students have (wealthy) parents and grandparents who saved for their children’s education and have thus contributed the bulk of the cost. Yet other diligent students manage to find the time to work at one (or two or three) part-time jobs, the earnings from which enable them to avoid any debt or loans. I have tremendous respect and great sympathy for these kids—and they are kids—who have to endure a full semester-load of coursework in addition to an additional 20 to 30 hours of paid work per week. These students rarely have time for anything else, and I make a habit to remind them to keep track of all the debt they do *not* incur, compared to their peers with student loans. With no debt, their holistic net worth is greater, and their holistic balance sheet will likely look much better in five to ten years. In my view, this *lack of debt* should be valued and quantified.

13. See Baum and Payea, *Trends in Student Aid*.

14. See Baum and Payea, *Trends in Student Aid*. In Canada 54 percent of students with a bachelor’s degree graduate with debt. From Bayard and Greenlee, *Graduating in Canada*.

I would even argue that indebted students, who have decided to finance their education by borrowing, should really keep track of all the time they spent having fun while in college, using a journal or keeping a running total. When these graduates come to me with concerns about all the debt they have incurred and now have to repay, I remind them of their colleagues who likely spent much less time at parties and bars, and hence avoided debt. These students should perhaps create another asset class on the left side of the holistic balance sheet called “fun capital” to record the sum total of all the hours they spent clubbing while investing in their human capital.

Did Anastasia Accept the Offer?

By the way, in case you were wondering, Anastasia, the student who was trying to figure out how to finance her education, turned down my offer for an equity stake in her future labor income. She protested that it felt too much like slavery. In fact, she is not alone in feeling that way. Despite being an advocate for the idea, this is what none other than Professor Friedman wrote about human capital contracts back in his 1962 classic *Capitalism and Freedom*: “...they are economically equivalent to the purchase of a share in an individual’s earning capacity, and thus partial to slavery.” I guess even he had his doubts. Oh well. Perhaps I personally shouldn’t have been so greedy. Maybe next time I’ll ask for 5 percent dividends instead of 10 percent.

Summary: The Four Principles in Action

- Investing in education can clearly ADD to the value of your human capital, although you might incur debt that you must SUBTRACT from your holistic balance sheet. The equation only makes sense if the difference between the additional human capital value and the debt is positive.
- The premium you can command from higher education will be MULTIPLIED over your entire working life, so be careful not

to think myopically about the benefits over short versus long periods of time.

- Remember that the total gains to you can be DIVIDED to raise your standard of living every year through your entire life span. More on this in later chapters.

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