



# THE SUSTAINABLE WEALTH PLAN

Jeffrey K. Speakes

Copyright 2015

# TABLE OF CONTENTS

<b>3</b>	<b>FORWARD</b>
<b>4</b>	<b>CHAPTER 1 INTRODUCTION</b>
	1.1 Seeking a cure for financial illiteracy
	1.2 Sustainable Wealth Plan
<b>15</b>	<b>CHAPTER 2 HUMAN CAPITAL</b>
	2.1 Human Capital
	2.2 Student Loans – the next subprime?
	2.3 Risk of Investment in Human Capital
<b>22</b>	<b>CHAPTER 3 SPENDING RULE</b>
	3.1 Optimal Savings Rate
	3.2 Why is Boomer Net Worth so Low
	3.3 4% Withdrawal Rate
<b>29</b>	<b>CHAPTER 4 PRODUCTIVE DEBT</b>
	4.1 Productive debt
	4.2 No More Harvard Debt
	4.3 Challenging conventional wisdom the Case for HO
	4.4 Large Scale Mortgage Refinance
<b>38</b>	<b>CHAPTER 5 INVESTMENT RETURNS</b>
	5.1 Everyone is a portfolio manager now
	5.2 Goodhart's law and Expected Returns
	5.3 Is demography destiny?
	5.4 Time Diversification and Human Capital
	5.5 How to Become a Billionaire by Bill Ackman
	5.6 Sustainable Wealth Investment Plan Page 2 of 79
<b>51</b>	<b>CHAPTER 6 RISK MANAGEMENT</b>
	6.1 Black Swans
	6.2 Retrenchment Rule
	6.3 Ratchet Rule
	6.4 Gift of a Lifetime
	6.5 6% a Month
	6.6 Good derivative, bad derivative
	6.7 Antifragility
<b>67</b>	<b>CHAPTER 7 CASE STUDIES</b>
	7.1 NBA Superstar (85% savings rate)
	7.2 You are not Yale
	7.3 Mr. Money Mustache
	7.4 Biden and the SHED
<b>75</b>	<b>CHAPTER 8 WHAT TO DO NEXT?</b>
	8.1 How to really ruin your financial life
	8.2 GAMMA
<b>79</b>	<b>APPENDIX</b>

# FORWARD

This series of essays provides a simple approach to managing the key elements of your financial life – building and protecting your human capital, managing your financial capital, and identifying a stable and sustainable consumption path.

# CHAPTER 1: INTRODUCTION

## 1.1 SEEKING A CURE FOR FINANCIAL ILLITERACY

In 2012, Federal Reserve Chairman Ben Bernanke<sup>1</sup> gave a speech on the importance of financial education. People commonly make financial mistakes such as saving too little, taking on too much debt, holding too little life insurance, making bad investment decisions and paying excessive fees that are unnecessary. The consequences of these mistakes can be enormous. They can be measured in terms of foregone opportunities, lesser net worth, or even personal bankruptcy and family impoverishment.

### REASONS FOR MISTAKES

#### Complexity

Why do people make these “mistakes”? Everyone faces complicated financial decisions such as how much education to obtain, how big a home to buy, how much to borrow and to save, how to invest, how to manage retirement. Financial products can be complex and multi-featured. Typically, financial products salespeople have an information advantage relative to the customer, and in many cases are incentivized to complete a transaction rather than augment the customer’s welfare.

Sometimes, financial products are sold to people who do not fully understand all the relevant features. The positive features are accentuated while the negative features are downplayed or ignored. One example of this is the 2/28 hybrid subprime mortgage loan that was very popular in the mid 2000s. This mortgage had a relatively low rate that was fixed for two years, and at the end of two years the rate would adjust to a floating rate at a large spread over a market index, typically LIBOR. The combination of a floating rate and large spread meant that this loan was highly risky for the borrower after the two year fixed rate period. The key selling point for the loan was that if the borrower could maintain a history of on-time payments during the fixed rate period, then the borrower would be eligible to refinance into a prime mortgage loan at a much lower rate. The unstated premise underlying the loan was that housing prices would trend higher. Of course, housing prices peaked in 2007 and began to fall. This eliminated the possibility of refinance for most 2/28 borrowers.

When you stop and think about the complexity of financial products, it is easy to see that ordinary people may not fully grasp the intricacies. This point was driven home to me by another Bernanke speech<sup>2</sup>; a presentation to his fellow professional economists at the

American Economic Association in January 2009. In this speech Chairman Bernanke was describing what he felt to be the root cause of the financial crisis; namely, proliferation in mortgage loans with low initial payments. In particular, he focused on the “Pay Option ARM” in which borrowers were allowed to select their desired payment from a set of choices. The lowest payment generally was based on an initial start rate of 1%. The Chairman calculated the monthly payment on a hypothetical \$180,000 loan to be just \$150 ( $\$180,000 \cdot .01/12 = \$150$ ), as compared to \$1,079 for the payment on a thirty year fixed rate fully amortizing loan at the then market rate of 6%. Obviously, \$150 is a lot lower than \$1,000 and this enabled many more people buy homes or to refinance. However, the typical Pay Option loan payment was not “interest only” as assumed by the Chairman, but rather was fully amortizing. The fully amortizing payment at a 1% annual rate is \$579. In other words, if one of the smartest economists on the planet, in a speech assigning blame for a major financial calamity could be off on his estimate of the correct payment by 300%, how are the rest of us going to get it right?

## **Financial Illiteracy**

One issue is a widespread lack of financial literacy. Perhaps financial decision-making would improve if more people became financially astute. Or, another possibility is people are fully aware of what they are doing. For example, savings rates are low simply because people discount future consumption heavily, strongly preferring favor consumption today. To choose between these alternative explanations, we need to assess the effect of financial literacy on financial decision making.

Academic experts aim to measure financial literacy using survey techniques. If people are unable to answer simple questions about percentages, or interest rates or even arithmetic, then they are deemed to be not financially literate. This problem is widespread. For example, more than 50% of the respondents on a survey were unable to correctly answer all of the following questions: 1. A disease has an incidence of 10%. Given 1,000 people, how many would you expect to have the disease? 2. If 5 people all have the winning number in a lottery and the prize is \$2 million, how much will each of them get? 3. If you invest \$200 at 10% annual interest, what sum will you have in two years? Based on questions like these, Professor Annamaria Lusardi has put together an index of financial Literacy (the FLI), and in one research paper<sup>3</sup> she shows that people that score higher on the FLI tend to save more and spend more time engaged in retirement planning. People who score higher on the FLI also have higher savings rates, less debt, and in general appear to make more sensible financial decisions.

It seems to me that financial illiteracy is the failure to understand adequately how financial products work and, in particular, what are the downside risks. Rather than being a narrow problem, Professor Lusardi’s research and Chairman Bernanke’s 2009 speech

suggest that it is widespread. In fact, maybe nearly all of us are afflicted with this disease. It is important and worthwhile to search for a cure, or at least a way to cope.

## **Psychology**

Behavioral researchers have found that there are psychological obstacles in the way of making coherent financial decisions, even if you have access to good information and advice. It is worthwhile to attempt to identify these obstacles and understand how they can impair good decision making.

## **Pound Foolish**

Finally, some argue that the primary factors keeping most people from achieving financial independence are structural – falling real wages, low economic mobility and rising costs of necessities including education, housing and health care. Irrespective of what you think of the merits of this argument, people will be better off if they make better decisions. How can they do that?

## **SOLUTIONS**

### **Regulation**

What is the solution to this problem? One answer is consumer financial protection. The Frank Dodd financial regulation bill mandated establishment of the Consumer Financial Protection Board (CFPB). The CFPB encourages financial services companies to offer simple products that are easily comparable across vendors, and has the authority to force providers to disclose information in an understandable format. This is intended to make it a lot easier for customers to conduct comparison shopping. However, this does not address the reality that financial decision making is inherently complex. There are several sources of uncertainty including future wage income, investment returns and mortality. Simple products would be great; but which ones should we buy and how much?

### **Education**

Another approach is to develop educational programs in financial literacy for school children and adults, just as Chairman Bernanke discussed in his recent speech. The Fed has established a website that contains useful materials for students and teachers alike. Professor Lusardi has shown that people who participate in financial education programs

score higher on her literacy index, and therefore are more like to make sensible financial decisions.

### **Trusted Advisor**

Of course, you can always turn to firms that offer advice and guidance that is unbiased. But, how can you be sure that your advisor is unbiased and that her advice is worth her fee?

Perhaps the best answer is that buyers of financial products need to become more knowledgeable and discerning. At the end of the day, each individual needs to choose the information sources that they find most amenable and trustworthy. The goal is to find advice that is unbiased and expert. You don't necessarily have to become an expert yourself, but you do have to learn enough about the issues so that you are comfortable you are not being led astray.

### **Economic theory**

Economists argue that financial planning rules of thumb (like a 4% withdrawal rate in retirement or a 10% savings rate while working) are not optimal and maybe even not sensible. The key economic idea is that consumption should be stabilized as much as possible. Since income is not stable, the implication is that the savings percentage of income will not be stable either. In periods of relatively high income, the optimal savings rate will be high and in periods of relatively low income, the optimal savings rate will be low.

Economists have developed sophisticated models to solve the financial planning problem. The objective is to find the maximum smoothed consumption path that is consistent with your resources and aspirations. The solution is take account of uncertainty about future wages, investment returns, mortality, and non-discretionary expenditures and solve for a decision rule that produces the appropriate spending and investment rules given your current situation.

The problem I see with the economist approach is twofold. First, the calculation is complex and not likely to be fully understood by very many people. It is more likely that people will follow a program that they understand. Second, the solution may be fragile in the sense that it is highly sensitive to the underlying assumptions. I think a better way to go is to build in a margin of safety through what I call a "sustainable" financial plan.

### **Sustainability – keeping it simple**

To paraphrase Herb Stein, if a path is not sustainable then it will not continue forever. Conversely, a sustainable path is one that is likely to be able to withstand shocks without failure. Everyone is on a financial path of one sort or another, but many of them will eventually require drastic adjustment. How do you come up with a viable plan?

You can go to a certified financial planner or to an economist that specializes in financial planning. Or you can produce a bare bones plan yourself. The following section lays out the key elements of the plan.

## 1.2 SUSTAINABLE WEALTH PLAN

This essay contains the key elements of the Sustainable Wealth Plan (SWP).

The basic idea is to put together a plan that has no or very little chance of failure, where failure means to run your wealth down to zero.

### STEP 1: PREDICT FUTURE EARNINGS

The first step is to recognize the importance of what economists call “human capital.” This is the present value of your future (after-tax) earnings stream. What does this mean? Your earnings “stream” is the series of annual incomes, from now until retirement. Naturally, since this earnings stream lies in the future, we can’t know exactly what it is today. But, there is a lot of historical data on incomes as a function of occupation, education and experience. Based on data in the Federal Reserves’ Survey of Consumer Finances, shown below are income age profiles (that is, income as a function of age) for high school and college graduates. These profiles are for the median individual in each group. This means fifty percent will have higher earnings and fifty percent will have lower earnings. Note that the median college graduate enjoys roughly a doubling of real income over his or her working career.

How can you come up with something like this for yourself? Well, you can use these median estimates. Or, you can do better by including additional data like your current wage, information on average wages in your chosen field, etc.

As you progress through your career, you will continually be compiling new data with which to modify your estimate.



## **STEP 2: ESTIMATE THE AFTER-TAX REAL RATE OF RETURN ON INVESTMENT**

Suppose you have a portfolio of financial assets such as stocks and bonds. The rate of return on investment is the rate at which the portfolio will grow (over time, we hope, the average rate of return will be positive). Growth can come through increases in the price of the assets or through interest or dividend payments. For example, over the past hundred years or so the overall U.S. stock market has thrown off returns of approximately ten percent, before taxes and before adjusting for inflation. Adjusting for taxes and inflation, the real after-tax equity return has averaged about 7% over the long haul. Estimating the future real return is a pretty complex undertaking. To simplify, let's suppose there are two asset classes – stocks and bonds. Further, let's suppose the expected real after-tax rate of return on stocks is 6% and on bonds is 0%. A fifty/fifty allocation between stocks and bonds will then have an expected return of 3%. Thus, let's say that we believe 3% is a reasonably conservative estimate of the real after-tax rate of return.

## **STEP 3: CALCULATE THE VALUE OF HUMAN CAPITAL**

The next step is to discount the future income stream by the 3% rate of return. That is, we find the present value of the future income. What does this mean? Suppose you have \$10,000 today and you invest it at 3% for one year. One year later you will have \$10,300. The “present value” today of \$10,300 one year in the future is \$10,000. If you apply this idea to your projected income each year in the future and then add up the present values, you have the present value of future income. This is what we call human capital (HC). The rationale for using the financial rate of return for the discount rate is simply that were we to have a portfolio of this size today, invested at 3% return, we could generate the series of future after-tax real incomes.

The chart shows the age profile of human capital for the median high school graduate and median college graduate. To see how we get this “age profile” suppose our college graduate is 22 years old. The first number on the chart is the present value of income from age 22 to retirement. The second number on the chart is the present value of income from age 23 to retirement, and so on.

Notice several features of the chart. First, the HC of the college graduate is more than 50% higher (\$600,000 greater) than the HC of the high school graduate. This suggests a very significant return to graduating from college. Second, at some point the HC peaks out and begins to decline. This will necessarily occur as you approach retirement. However, it is likely that HC can be improved a lot early in your career. For one thing,

you can increase HC by going to school. Or you can increase HC through experience on the job and career management. Almost surely, the most important element of your financial plan is how you manage your human capital.

The last point to note about this chart is simply that the value of human capital for young people is really big. For the median college grad it is over \$1.4 million, and for the median high school grad it is more than \$800,000.

#### **STEP 4: CALCULATE WEALTH AS THE SUM OF HUMAN CAPITAL AND FINANCIAL CAPITAL**

Total wealth is the sum of human capital and “financial capital” (FC) which is the value of assets less the value of debt. Financial capital is what most people refer to as net worth. For young people, wealth is primarily human capital. For people closer to or in retirement, human capital is small and the bulk of wealth is in the form of financial capital. The essence of the SSFP is that people should save out of current income enough so as to increase the value of FC to offset eventual declines in the value of HC.

The baby boom generation, on average, did not do this. Compare the human capital in the previous chart to the wealth of the median baby boomer nearing retirement. The Fed’s Survey of Consumer Finances suggests that median wealth for people aged 55-65 is only about \$250,000. This means that kids today are quite a bit richer than their parents and grandparents! How can this be? The simple answer is that the typical baby boomer did not save enough throughout their lifetime.

The chart shows human capital, financial capital and their sum, wealth, for the typical baby boomer. HC peaked out around \$1.4 million (in today’s dollars) back when the boomer was around 30 years old and then began to decline. The boomer savings rate was positive but low and the accumulated FC at retirement for the typical boomer will not support the accustomed rate of consumption spending. That leaves basically two options for the boomer: reduce consumption in retirement or delay the date of retirement.

There are two factors that drive financial capital. The first is your savings rate and the second is your investment strategy.

#### **STEP 5: CALCULATE A CONSUMPTION PATH THAT PRESERVES WEALTH**

By spending less than disposable income, and then managing your investment portfolio, you can build up financial capital. The major error made by many baby boomers is that

they allowed total wealth to decline. They did this partly because “experts” advised them to do so. Many financial advisors recommend strategies that call for declining wealth. Economists sometimes argue that the objective of personal financial planning is to die broke. The reason for this is that if you don’t die broke then you have foregone potential consumption, and the goal of economic life is to maximize consumption.

I think this is an error. For one thing, you do not know when you are going to die, so allowing your wealth to decline risks becoming broke before you die. For another, there is a lot to be said for building and hanging onto financial wealth. This will give you lots of valuable options in your later years; options like assisting family members, supporting charities, or financing ventures. Also, by attempting to preserve your wealth you automatically build in financial cushions against unexpected shocks, which tend to occur a lot more frequently than most of us expect.

A simple consumption rule that preserves wealth is to set consumption equal to wealth multiplied by the estimated return from Step 2. Take the example of the median college grad mentioned earlier. This individual’s human capital is \$1.4 million. Let’s suppose financial capital is zero. Using 3% as our estimate of return, we come up with  $\$1.4\text{M} \times 3\% = \$42,000$  as the sustainable consumption level.

If the college graduate adopts and sticks with this spending plan, he or she will accumulate FC in excess of \$1 million by the time of retirement. That’s not \$1 million in future deflated dollars; that is \$1 million in current dollars.

## **STEP 6: ALWAYS SAVE SOMETHING**

It is possible, even likely for young people with rapidly growing incomes, that the sustainable consumption level is greater than current disposable income. In this event, it is advisable to lower your consumption level to 90% of disposable income. This allows you to take advantage of what Einstein is reputed to have said is the most powerful force in the universe – compounding. By starting to build a financial asset portfolio as early as possible you get this force working for you. If you borrow to finance consumption in excess of disposable income, you have the most powerful force in the universe working against you.

To summarize the argument so far, set consumption equal to the minimum of 3% of wealth or 90% of disposable income. This keeps wealth from falling as you age. So far, we have used a steady 3% investment return, and spending of 3% of wealth. The next step is to recognize that the actual investment return will fluctuate.

## STEP 7: ADJUST THE CONSUMPTION RULE SO AS TO STABILIZE CONSUMPTION AGAINST SHOCKS TO WEALTH

So far we have come up with a consumption rule that is sustainable. But it is not necessarily stable. Fluctuations in asset prices can push wealth around a lot, particularly for older people whose wealth is predominately in the form of financial capital.

We propose two modifications to the basic spending rule, one to address declines in wealth and the other to address increases in wealth. Suppose your wealth falls, how should you adjust your spending? According to the basic rule, if wealth falls 10% then your spending should fall 10%. But it is possible, even likely that poor investment returns will be followed some time in the future by better returns, at least that is true if you have been reasonably conservative in estimating the return and in managing your portfolio. To avoid unnecessary declines in spending in response to temporary declines in wealth, we propose the Retrenchment Rule.

The Retrenchment Rule (the name comes from the title of a book by financial economist Gordon Pye) provides guidance about when you have to adjust your spending downward, or “retrench.” To implement the rule you need to calculate the value of a fixed lifetime annuity that you could purchase with your current wealth, using a very conservative estimate of how long you might possibly live. Insurance tables suggest that the probability of anyone living past the age of 110 is near zero. So, I propose calculating the fixed annuity (FA) based on current wealth, a 3% return, and assumed mortality at age 110. A fixed annuity is a constant payment from now to a terminal date. If this fixed annuity is greater than last year’s spending level, then you do not need to retrench at all. But if the fixed annuity is less than last year’s spending, then you have retrench back to the amount of the fixed annuity.

In short, the Retrenchment Rule says that consumption this period is the minimum of consumption last period and the fixed annuity.

What about responding to increases in wealth? If wealth increases substantially, it would seem reasonable to consider ratcheting up spending. The Ratchet Rule tells us when to do this. To implement the Ratchet Rule you need to specify another discount rate, equal to or lower than the expected rate of return. I propose 1% for this, but you can use something a bit higher, like 2% or even 3%, if you like. My rationale for the 1% Ratchet Rule is that if you follow this rule, you have a good chance to join the 1% net worth club (the “1% club”), that is, you have a good chance to eventually enjoy financial wealth greater than all but 1% of households. Today, that means wealth of approximately \$5 million. The effect of the 1% Ratchet Rule is that you do not increase your consumption

until your initial wealth triples. If you follow this rule then the chance of eventually reaching the 1% club is fairly good, even starting with zero financial capital (of course, this is true only if just a small fraction of people adopt the strategy; if everyone does, then the threshold for the 1% club will be a lot higher than it is today).

The 1% Ratchet Rule says that you can increase your spending whenever wealth increases to the point that 1% of wealth is greater than the current consumption level. That is, the Rule says that consumption this period should be the maximum of consumption last period or 1% of current wealth.

Again, you don't have to choose 1% for the Ratchet Rule. If you choose 3%, then you will be led to ratchet up spending whenever your wealth increases. The effect is to enable greater consumption, but sharply reduce the chance of reaching the 1% club.

## Simulations

To prove that your plan is stable and sustainable, it is important to subject the plan to random shocks in investment returns. The 3% return that we have been using is simply an estimate of the average rate of return over time. The actual return each year will be different. This is why we proposed the Retrenchment and Ratchet Rules. To test how these rules work, we need to simulate actual returns.

The chart below shows HC, FC and Wealth just as earlier charts have done. The difference is that growth in FC is driven by randomly simulated rates of return. We are assuming a 50/50 portfolio allocation between risky stocks and safe bonds. We can repeat this exercise hundreds or thousands of times and keep track of the performance of consumption spending and wealth. An important criterion for a sustainable plan is that the probability of running out of wealth is very close to zero. This can be tested by running 1,000 or more simulations and counting the number of times that wealth goes negative. The probability of plan failure is this number divided by 1,000.

Another interesting calculation is to count the number of scenarios in which wealth reaches \$5 million. Dividing by 1,000 yields the probability of joining the 1% club.

*Here is one simulation:*

*What is happening in the scenario shown here is that financial capital is increasing rapidly in retirement. This is because the series of randomly drawn annual returns is favorable. If you find yourself in a scenario like this you may want to increase*

*consumption spending more rapidly than the 1% Ratchet Rule suggests. The beauty of the plan is that you are likely to have the opportunity to do so.*

*To implement the SWP, we have established a simulation tool at [www.clucerf.org](http://www.clucerf.org). This tool allows the user to experiment with some of the key assumptions – like percent of financial capital allocated to equities, initial consumption level, retirement age, ratchet rule, etc. – and examine the consequences for the sustainability of the plan and stability of spending. A good way to do this is to collect the results of a large number of simulations. For example, using the parameter settings: 3% spending rate, 1% Ratchet Rule, 50/50 equity/bond mix, I get zero cases of plan failure (wealth reaches zero) in 1,000 simulations. And in just over 200 of the scenarios (20% of the time) wealth reaches the \$5 million cutoff for the 1% net worth club.*

## **SUMMARY**

The main features of the SWP are first that you should measure and manage your human capital, and second you should adopt a spending plan that preserves wealth even as your human capital recedes.

## **REFERENCES**

- 1 Ben Bernanke, “Financial Education,” 2012.
- 2 Ben Bernanke, “Monetary Policy and the Housing Bubble,” 2009.
- 3 Annamaria Lusardi, “Planning for Retirement: The Importance of Financial Literacy,” Public Policy and Aging Report, 2009.

# CHAPTER 2: EDUCATION AND HUMAN CAPITAL

## 2.1 HUMAN CAPITAL

The Fed's Flow of Funds (FOF) report shows that household sector net worth is approximately \$80 trillion. This wealth is concentrated in households headed by people aged 50 or older. After all, for most people it takes time to build up wealth in the form of stocks, bonds, real estate and other tangible assets. The Flow of Funds does not provide data on another asset class, one that is far greater in value. That is human capital. Human capital can be thought of as the value today of future earnings. While there are no official measurements of human capital, it can be estimated by looking at current wages for workers in various age groups, and then making assumptions about real wage growth, retirement age and appropriate discount rates. Using age group wage data from the Survey of Consumer Finances and a real discount rate of 3%, I estimate the value of human capital for people currently working today to be approximately \$300 trillion, more than three times the size of measured household net worth.

Naturally, human capital is greatest for younger people since they have more years of earnings ahead of them. If you add together human capital and FOF capital, the resulting measure of total net worth is more evenly distributed across age groups. For example, the median FOF net worth for 25 year-olds is less than \$50,000, but median human capital is approximately \$400,000. Meanwhile, median FOF net worth for 65 year-olds is approximately \$200,000 while median human capital is close to zero (I am not counting pensions or Social Security income as part of human capital). It is interesting to note that median wealth of baby boomer households is less than that of their children.

Increases in FOF net worth arise through saving out of current income and returns on existing assets. Increases in human capital arise through training, education and development of experience and skills. For several decades, economists have been interested in measuring the return on schooling. While there are difficult measurement problems, the consensus opinion appears to be that the returns are high, on the order of 8 to 10%. That is, one year of additional education had resulted in an average increase of lifetime earnings by 8 to 10%. The research suggests that this number is trending higher over time. Naturally, these are aggregate estimates and would vary in a particular

instance, depending on the quality of the school, nature of the program and characteristics of the student.

To translate this finding into a return on investment in dollars (ROI), you need to assess two things: the foregone income and the cost per year of the schooling. College tuition and fees are rising much more rapidly than the overall cost of living and the quantity of student loans has risen sharply in recent years. It is estimated that student loan balances now exceed \$1 trillion. Many young people leave school with a large debt burden. If the degree or training does lead to a large improvement in employment prospects, as the research shows is true on average, then paying off the debt is entirely feasible. But for those graduates who do not find a great job, the debt burden can be a killer. Also, the prospect of large debt can detour students with great potential but limited financial resources.

## ISSUES WITH STUDENT LOANS

Economists like to argue that consumers make rational investment decisions. In the case of student loans, rational behavior would have the student forecast future income with and without a particular education program and then enter into student loans only where the present value of the incremental wages is greater than the cost of the schooling, including foregone income. But this is not an easy calculation to make for a number of reasons. For one, even conditional on completing a particular degree, the variability of earnings across individuals is large and growing. Another factor is that the probability of completing a degree program depends on many factors, including talent, commitment and unforeseeable future circumstances. The probability of completing a degree appears to be much lower for for-profit private schools than it is for public or non-for-profit private schools. While individual students may have a good sense of their own talent and commitment, their ability to accurately predict future income is probably pretty low.

Another issue with student loans is that they are not extinguishable through personal bankruptcy. It seems to me that these factors can combine to detour promising students from pursuing their desired education programs.

## SHARED INCOME

The Lumni Corporation (<http://www.lumni.net>) has a partial solution to this problem. Lumni specializes in education finance, but they are not lenders in the traditional sense. Instead of a loan, students agree to pay a portion of their future income stream in return for assistance in financing the costs of education.



Lumni has taken the return on education research that the economists have done and have stepped it up a notch. Lumni researchers estimate equations that predict typical student income paths for different degree programs and career objectives. They issue securities that pool policies for many students. While the income path for a particular student cannot be predicted with any degree of certainty, the performance of large pool of student incomes is fairly predictable.

Naturally, Lumni is primarily interested in students and programs for which there is a high likelihood of solid income. Presently, they are focusing on engineering students because the distribution of income for trained engineers is attractive. The mean income is high and the variability about the mean is low. Presumably, the program would also work for other technical fields like computer programming, math or science. It would not work so well for fields that are less remunerative.

## 2.2 STUDENT LOANS: THE NEXT SUB PRIME?

Student loans now total over \$1 trillion and delinquency rates are rising. Many young people are burdened in their 20's with tens of thousands of dollars of student debt. Some commentators have pointed to student loans as the "next subprime." What does this mean? Does it mean that student loan defaults are expected to cause another financial debacle at some time in the future? Or does it simply mean that many people are likely to wind up worse off after taking out student loans? To evaluate these possibilities, it is useful to review the subprime story.

The subprime mortgage market is credited with playing a significant role in the housing boom and bust that precipitated the financial crisis and great recession. In the case of subprime mortgages, the idea was to expand home ownership opportunities to an 'underserved' market; namely, people with poor credit scores, who are disproportionately minorities. Both public policy and private sector initiatives pushed forward the development of the subprime market. The basic premise was that traditional mortgage underwriting standards were too conservative. The evidence for this was that credit loss rates for prime mortgage loans were miniscule, just a few basis points a year.

Subprime mortgage loans generally refer to borrowers with low credit scores, like FICO score less than 620. The traditional approach to these loans was to require strong compensating factors such as very large down payments. Thus, the traditional approach to subprime did not entail weakening of underwriting standards. However, this changed in the 1990s and early 2000s. Government programs sponsored by FHA or by Freddie

Mac and Fannie Mae included loans with **both** modest down payments and low FICO scores. Innovations in private label securitization (that is, in which no government or quasi-government guarantee is involved) appeared at first to be highly successful. Securities based on subprime loans received high ratings from ratings agencies like Standard and Poor's and Moody's Investor Services and the demand for these securities was very strong. This enabled massive expansion of the subprime market until by 2005 it constituted 20% of all loan originations.

However, subprime borrowers were inherently more financially fragile. The viability of the market depended on the ability of the subprime borrower to upgrade to prime if a series of on-time payments was achieved. So long as housing prices continued to rise, the promise of upgrading to prime stayed intact. But when home prices peaked out in 2006 and began to fall the path out of subprime (and high mortgage rates) was blocked. This meant that subprime defaults were bound to soar. Combining this with early payment defaults by speculators, the value of mortgage backed securities declined sharply and set in motion the financial crisis.

So, in what sense do student loans constitute the next subprime?

I think the best analogy comes in the so-called for profit sector of the education market. The For Profit (FP) sector is to be distinguished from traditional public or not-for-profit private institutions. FP institutions have enjoyed massive growth in recent years, largely by addressing the "underserved" student market, that is, those students that do not attend traditional colleges or universities. Since only about 25% of high school graduates complete a degree from traditional colleges and universities, this "underserved" market is huge. While it is surely true that many young people do not aspire to continue their education beyond high school, there are others who are prevented from doing so by financial or other obstacles.

The positive case for FP institutions is that they have significantly expanded access to higher education for those who do not attend traditional colleges or universities.

However, students at FP institutions have less positive financial outcomes than students at the traditional schools. Research by Harvard economists Deming, Goldin and Katz<sup>1</sup> shows that FP students have higher dropout rates and debt levels than students at traditional schools. They also find that the value added of the schooling in terms of increasing wages is lower. This can be due to lesser aptitude (FP students have lower high school ranking), other commitments (FP students are more likely to be working full-time) and the high cost of the typical FP school.

Assuming that the FP institution experience involves less value added, higher costs and higher dropout rates, the average return on investment in the FP programs is going to be lower than it is in traditional programs. Therefore, the potential for financial difficulties for students of FP schools is greater than it is for students of traditional schools.

This is somewhat akin to the situation in subprime mortgages. While the motivation to lower underwriting standards so as to expand the home ownership rate may have been laudable, the end result has been a worsened financial position for many subprime borrowers. Still, the fact that higher proportions of subprime borrowers and FP students end up with worsened financial outcomes does not necessarily mean that these programs are inherently fatally flawed.

For one thing, you should look at the successes as well as the failures. Suppose 90% of FP students were better off for the experience and 10% were worse off. Does the negative result for 10% negate the positive outcome for the 90%?

I think it is likely that the positive outcomes outweigh the negatives. Rather than attempt to curtail FP institutions, we should look for ways to reduce the percentage of negative results. One way to do this is to improve the predictive modeling of returns – that is, given the student characteristics including current employment and training, the prospective educational program and its cost, what is the likelihood of completing the program and achieving greater income? This modeling can form the basis for guidance counseling offered by the FP school or by third parties.

## 2.3 HOW TO MANAGE RISKS OF INVESTMENT IN HUMAN CAPITAL?

President Obama tells us that the highest return investment you can make is in your own (or your children's) education. The aggregate statistics appear to bear this out with college graduates earning about 50% more than high school graduates. Even after taking into the direct cost of four years of higher education along with the cost of foregone income, it appears that rates of return on investment in higher education are quite high, on the order of 8-10%. This is much greater than prospective returns on traditional bond and stock portfolios. However, unlike the case of traditional investments where you can reduce your risk by diversifying across a portfolio of securities, in the case of education investment it is much more difficult to reduce risk.

And there is a lot of risk. For one thing, college dropout rates are quite high (approximately 50% of students who enroll in four year schools ultimately receive a bachelor's degree). Second, the quality of education varies with the institution. Third, variability of wages across people with the same education credentials is also quite high. Fourth, the supply and demand picture for workers in your chosen field can change dramatically in just a few years. Thus, even though the aggregate and average statistics look compelling, there will many people who invest tens of thousands in college but do not reap the expected financial return (although they may still achieve significant non-pecuniary benefits).

What can you do to mitigate these risks? First, you can look at the data to help estimate the likelihood of financial success. This depends on the institution and course of study. There is a large data set that can be used for this exercise. For example, compensation expert PayScale (<http://www.payscale.com/>)

produces an annual assessment of the return on investment for 850 U.S. institutions of higher learning. They also show incomes by degree and occupation. However, to this point no one has combined the two types of analysis to show returns by institution by course of study. More granular data is being gathered by CollegeMeasures (<http://collegemeasures.org/>), a partnership between the American Institutes for Research and Matrix Knowledge Group that "is focused on using data to drive improvement in higher education outcomes in the United States."

The probability of financial success also depends on individual characteristics. For example, high school academic rank is a fairly good predictor of college academic performance. While this does not mean that students who do poorly in high school should not go to college (for a different view, see Vedder<sup>1</sup>), it does mean that the probability of success (graduation) is lower.

Another strategy to mitigate risk is to invest incrementally. The theory of real options tells us that holding off major commitments in order to increase information is often a valuable strategy. One way to do this is to enroll in a two-year Community College program. This can be a low cost way to assess the depth of your commitment to a more rigorous and lengthy academic regimen.

A third strategy is to utilize online education options. It is likely that information technology can reduce the cost and expand the access to higher education. There are numerous initiatives to apply new technologies to reengineer the classroom. A "60 Minutes" segment recently featured Salman Khan, founder of the Khan Academy (<http://www.khanacademy.org>). The Khan Academy's motto is "A free world-class

education for anyone anywhere.” The website presently contains over 3,000 short (8 to 15 minute) videos on topics ranging from mathematics to science to economics to history. The videos are simple and entertaining and students can review them at their own pace. In a classroom, students can work problems with the results electronically monitored so that the classroom instructor can provide individualized and targeted help.

Numerous great universities now offer classes on line, and some of these are enormously popular. Former Stanford computer science professor Sebastian Thrun’s robotics course had an enrollment of 60,000. Professor Thrun has set up a company (Udacity, <http://www.udacity.com>) to produce and market online courses. The company’s first course, on building a search engine, drew a world-wide audience of 160,000 students. Students take the course Pass/No Pass and those who pass receive a certificate from the professor and Udacity.

Major universities are participating as well. For years Yale University has made available on the internet taped lectures for many of its classes. Coursera (<https://www.coursera.org/>) is a joint venture of several great universities (participating institutions include Stanford, the University of Pennsylvania, the University of California at Berkeley, the University of Michigan and Princeton) to offer on line courses. Also, MIT and Harvard (<http://www.edxonline.org/>) have started a joint venture to produce online courses for free (for now). Each graduate will receive a certificate of completion.

Online educational content is rapidly increasing. But that does not yet translate into a credential that helps someone get a better job or higher pay. Here is where improved predictive modeling can be useful. If researchers can measure the connection between credentials, skills, individual characteristics and wages, then online courses can be designed to offer the skills in high demand, and educators can design programs and means of evaluating students that provide a valuable credential.

## REFERENCES

- 1 David Deming, Claudia Goldin and Lawrence Katz, “The For-Profit Postsecondary School Sector: Nimble Critters or Agile Predators?” *Journal of Economic Perspectives*, Winter 2012.
- 2 Richard Vedder, “Why College Isn’t for Everyone,” *Bloomberg BusinessWeek*, April 2012

# CHAPTER 3: SAVING AND CONSUMPTION

## 3.1 OPTIMAL SAVINGS RATE

The US savings rate is really low and has been for some time. For many years this was explained by the argument that people were getting wealthy through appreciation of their homes and stock portfolios, so the need for saving out of current income was low. And sure enough, household net worth did expand nicely through the decade up to 2007 even with the low savings rate. However, that story was shattered with the housing bust that began in 2007. Yet, while savings rates have picked up a bit since 2007, they still are very low both historically and relative to other countries.

Many observers are content with low savings today. Sure, they say, people have to eventually save more, but today there is a shortfall in aggregate demand so the last thing we need is expanded savings today. This is short-sighted. It would be desirable for savings rate to go up a lot, and the sooner the better.

In order to preserve real consumption in retirement, what savings rate is required during the working years? Well, the answer depends on several factors, the most important of which is the after-tax real return on your portfolio. Suppose your income at age 40 is \$50,000, you expect your real income to be stable for the next 25 years until you retire and you would like to maintain real consumption stable through the remainder of your working years and retirement. Further, your current net worth is zero and you have no retirement plan aside from social security. In that case, if the real rate of return is 6% (which is a bit below the long-term real equity return) then the savings rate must be 9% to achieve a stable consumption path. On the other hand, if the real rate of return is 2% (which is close to what many experts are currently projecting for balanced portfolios) then the savings rate must be 19%.

Although there are no doubt some households saving at this rate, it is not the norm. Is this a huge problem for baby boomer retirement? Well, maybe not. The analysis above is very simple and neglects a number of important issues including positive initial wealth

(aside from social security) and the potential for lower expenses after retirement. For example, if the \$50,000 wage earner mentioned above had initial net worth of \$100,000, then the savings rate required to maintain real consumption drops to 12% assuming real returns of 2% per year, and drops to zero assuming real returns of 6% per year.

In a recent annual report on savings behavior, Vanguard<sup>1</sup> estimates that only 30% of households are saving adequately for retirement and that most households need to save between 12 and 15% of annual income in order to avoid a major reduction in their living standards in retirement. This required savings rate is lower for lower income households, due to the fact that social security replaces a greater proportion of income for a lower income person. Conversely, higher income people should be saving a greater portion of their income if they are going to maintain the same standard of living in retirement as during the working years.

While it might be expected that savings recommendations from a large mutual fund management company would be biased upward, the Vanguard estimates seem reasonable to me. Again, the key is the long-term real rate of return on capital (i.e., the real after-tax investment return).

As mentioned above, the historical long-term real equity return is in excess of 6%. But, it has been widely documented that the typical household has achieved a much lower real return on investment. This is partly due to portfolio allocation into lower return asset classes like bonds and cash. In addition, management fees and transaction costs reduce the net return. Finally, poor timing and excessive trading further reduce the net return. While it is feasible to constrain expenses and resist over-trading, evidence suggests that it is prudent to assume a modest real return, like around 2% per year.

To determine the most appropriate savings and consumption behavior for a particular household requires a lot more information than is being considered in my simple calculations, and probably in the Vanguard model as well. You should consult with an advisor to obtain access to a sophisticated planning model. Still, without doing the detailed calculations, I believe that most people will find that they are going to have to increase their savings rate a lot, or work longer than “normal retirement,” or adjust to lower consumption in retirement.

## **A CAVEAT**

Many distinguished economists have published articles that contest my conclusion. For example, economist Laurence Kotlikoff<sup>2</sup> argues that simple estimates of required savings rates are often over-stated due to methodological flaws in the calculations. In

particular, he points out that optimal consumption smoothing is generally achieved by varying savings rates over time and that calculating the optimal savings rate requires the use of a complex mathematical model. Kotlikoff argues that many households are saving too much and buying too much life insurance. They are living like misers today so that they can live like kings at age 80. In order to evaluate your own situation, you are encouraged to buy Kotlikoff's online financial planning software. This software (ESPlanner) is based on the latest economic theory and can be used to trace out the optimal savings rate path for you.

It is not surprising to me that an efficient algorithm would produce savings rates that are on average lower than those calculated according to financial planning rules of thumb. However, I don't believe most households are currently following savings profiles that are consistent with typical financial planning rules of thumb. Instead, they are systematically under-saving relative to such rules. Application of an efficient algorithm would likely reduce the degree of under-saving, but I don't think it would change the sign. Bottom line: do the calculation but don't be shocked if you find you are not saving enough.

### 3.2 WHY IS BOOMER NET WORTH SO LOW?

The Survey of Consumer Finances (SCF) shows that median net worth for baby boomers (households with head of household aged 55-64) was \$179,000 in 2010, down from \$226,000 in 2007. The median is defined to be the lowest of the top 50% (or the greatest of the bottom 50%). At first glance, it is surprising that the median net worth is that low. By definition, boomers have had 30 years to build up assets for retirement. A majority of boomers would have had access to a 401K savings plan at their work. Had they fully participated over a thirty year period, even without a company match, and earned a 7% return their retirement account alone would be \$500,000 today. Evidently, at least half of the boomers either worked for employers that did not offer such plans or they chose to not fully participate.

Not to denigrate my fellow boomers, but it seems to me that they (many of them) have missed an obvious and important opportunity.

To be fair, there are important components of wealth that are not included in the SCF. Most obviously, these include the after-tax value of social security and defined benefit plans. Unlike defined contribution plans like 401Ks, defined benefit plans are not counted in the SCF because the plan assets are owned by the sponsoring entity, not the plan participant. So, to the extent that boomer retirement spending objectives are satisfied by social security and pensions from defined benefit plans, there is little need to



build up additional stocks of assets. However, a long-term decline in the percentage of workers covered by defined benefit plans means that many if not most boomers will find retirement income well below their expectations.

In my view, boomer savings rates have been way too low. Consequences of low savings include high levels of consumer debt, inadequate net worth and, most fundamentally, restricted choices. Had they saved more in the past boomers today would have more options – to retire early, to support charitable giving, to launch a new business, to assist family members, etc.

What is the “right” savings rate? Suppose we adopt the economic theory of consumption smoothing, whereby every household aims for a stable real consumption stream over time. Earned income, of course, tends to be quite volatile over time – zero during school years, rising rapidly during the early working years, peaking out in middle age and gradually declining, and then plummeting to zero in retirement. The economic objective of smoothed consumption entails negative savings when young, positive savings during middle age and then negative savings again in retirement. Applying this model to the US today, and assuming a 3% real rate of return, known mortality at age 100 and no bequest objective, I estimate that an average savings rate of 15% would be consistent with consumption smoothing (this is an average rate; different age/income/net worth cohorts have quite different target savings rates, ranging from below zero to above 30%). One of the assumptions underlying this calculation is that the after-tax real rate of return on investment is constant at 3%. While this rate is fairly conservative in historical terms, in today’s market the risk free real rate is well below 3%. To achieve 3%, you will have to take on investment risk. Once you take return uncertainty into account, prudence would require a yet higher savings rate.

Some people do save a lot, even more than my calculation would suggest. For example, in his book “Millionaire Teacher,” high school English teacher Andrew Hallam describes a disciplined program of saving and investing that enabled him to create a seven figure net worth while still in his 30’s, even though his income was below the U.S. median. His program is pretty simple – be very frugal and invest in low cost passively managed index funds. Simple but not easy; Andrew’s savings rate appears to be about 50%.

Is it likely that many people will follow Andrew’s example? It does require a lot of focus and commitment. Also, many people simply have lesser income (perhaps no job) and/or greater financial obligations than Andrew. For them it would be even harder to ramp up savings. Still, Andrew is a lesson plan in what can be done, while the boomers in the aggregate are, like Greece, a lesson plan in what not to do.

Suppose for the sake of argument that many people attempt to increase their savings rates. What would be the economic fallout? In particular, would higher savings rates impair economic growth? Well, in the short run there would be dislocation as demand for consumer goods shifted to demand for capital goods. But in the long run, GDP would be higher thanks to a larger capital stock and greater economic productivity.

### 3.3 4% WITHDRAWAL RATE

One of the more revered rules of thumb in retirement planning is that retirees can be comfortable in spending 4% per year of their accumulated net worth. While the origin of this rule is not certain, it has been popularized by financial planning expert William Bengen in a series of articles dating back to the 1990s. Using historical data, Bengen examined various stock/bond portfolio mixes and various withdrawal rules. In his research, a withdrawal rule means to determine consumption during the first year of retirement as a fraction (1%, 2%, 3%, 4%, etc) of net worth at that time, and then to let the dollar amount of consumption subsequently grow with inflation. For each withdrawal rule, he calculated the length of time that the portfolio remained positive under a wide variety of historical scenarios. In brief, his results are that withdrawal rates of 3% or less are too “conservative” in the sense that the portfolio is still positive 50 years after retirement in every one of his scenarios. At 4% withdrawal the proportion of scenarios in which the portfolio lasted 30 years or more is very high. This is not true for withdrawal rates of 5% or greater. Therefore, Bengen concluded that the 4% rule is safe. Bengen also argued that keeping at least 50 percent of your portfolio in stocks (and as much as 75%) is strongly recommended as well. Even though equities have experienced severe downturns several times in the past hundred years, Bengen claims that the higher expected return on equities overwhelms the volatility risk.

My first thought regarding this argument is that historical data may not be an adequate guide to future potential outcomes. For example, historical housing price data showed no evidence of broad based housing price declines in the U. S., at least not until 2007. An alternate strategy for assessing the viability of a spending rule is to simulate portfolio performance given assumptions about the distribution of real returns. Assuming the expected return on equities is 5%, annualized volatility is 20%, and using a 50% allocation to equities, I calculate that the 4% withdrawal rule entails a substantial probability (about a third) of running out of funds within 35 years (before age 100 given retirement at 65).

While Bengen and many other financial planners or economists recommend an equity allocation of 50% or more, this is a matter of significant dispute. For example, retirement expert Zvi Bodie argues that, contrary to popular wisdom, the risk of equities does not decline as the holding period lengthens. While the variability of the average return does decline with horizon, the probability of a large loss increases. Thus, he recommends a very low equity weight for retirees. Instead, the bulk of retirement assets should be in inflation-indexed default free debt (Bodie claims his own retirement portfolio is entirely invested in Treasury Inflation Protected Securities (TIPS)).

If you follow this advice and adopt a low risk portfolio allocation, what is the implication for acceptable withdrawal rates? Naturally, the expected real return will be lower, let's say 1%. For this case the 4% withdrawal strategy is close to being reasonable. If you withdraw 4% of your portfolio at retirement and then enjoy the same real consumption each year thereafter, it will be 30 years before your portfolio is extinguished. So, if you retire at 65 and then don't live past 95, you will be fine.

Of course, there is a lot of uncertainty about longevity. From the individual's points of view, longevity risk is the chance that you outlive your portfolio. The obvious solution is to buy inflation-adjusted annuities that make payments from a specified starting date until death. The sellers of the annuities take on the longevity risk. This is a risk that would seem to be a natural one for life insurance companies to take on. Suppose a life company has two core businesses: selling life insurance and selling annuities. If longevity turns out to be greater than expected, the life insurance business will perform better and the annuity business will perform worse. Simply by adjusting the relative sizes of these businesses, it would seem that life companies could largely eliminate longevity risk.

The problem with annuities is that life companies are worried about adverse selection. This is the risk that people with long life expectancies will be more likely to be annuity buyers and people with short life expectancies are more likely to be insurance buyers. To protect themselves, life insurers will tend to price annuities according to "worst case" (long longevity) assumptions, thus making them less attractive. Probably partly for this reason, aside from Social Security and Defined Benefit Plans, annuities represent only a very small portion of retiree assets.

Individual financial planning is a difficult problem. The individual must choose savings rate, investment allocation, and withdrawal rate all in the face of considerable uncertainty about future income, investment returns and mortality. Some economists are confident they have developed models that solve the savings/investment problem. I agree that

these models provide useful insights. However, due to the complexity of the underlying problem, I'm skeptical that this confidence is fully justified.

## REFERENCES

- 1 "How America Saves 2011," Vanguard, 2011.
- 2 Laurence Kotlikoff, "Is Conventional Financial Planning Good for Your Financial Health?," Economic Security Planning, 2006.
- 3 Andrew Hallam, "Millionaire Teacher: The Nine Rules of Wealth You Should Have Learned in School," 2011.

# **CHAPTER 4: FINANCING USEFUL INVESTMENTS - PRODUCTIVE DEBT**

## **4.1 PRODUCTIVE DEBT**

How much debt is it reasonable for individuals to undertake? I propose two criteria for answering this question. First, you must be able to service the debt. Second, the debt should be “productive” in the sense that the benefits of the activity being financed are greater than the cost of the debt.

These criteria can be employed to evaluate any kind of debt, whether it be student loans, mortgage loans, auto loans or personal loans. But it is most likely that productive debt will be that which finances investments in human capital, like education loans, or financing new business ventures.

Some of the benefits of investment are financial, but not all of them. For example, the financial benefits of education investment include higher income, prospects for more rapid advancement in your career, and perhaps better ability to manage your financial affairs. But there are also substantial non-pecuniary benefits of greater education. While perhaps more difficult to quantify, these benefits should be considered in an assessment of the benefits of taking out loans to finance an education program.

The situation is similar with investment in a home. Financial benefits include imputed rent (you pay rent to yourself) plus housing price appreciation, if any, and tax benefits such as tax deductibility of mortgage interest and preferential capital gains treatment. Non-financial benefits include the pride of homeownership and community. Offsetting these benefits are the financial costs of home ownership including property taxes, insurance and maintenance expenses. In addition, there is a potential loss of mobility. This is of special import for young people not yet fully established in their careers. What about auto loans? Here you are financing acquisition of a durable good that will provide services for many years (at least we hope so). Enhanced mobility from owning a car may well enable economic benefits that more than offset the cost of the debt and steadily declining value of the car.

Today, households have approximately \$13 trillion of debt. Most of this is mortgage debt (\$10T) and the next biggest chunks are student loans (\$1T) and credit cards (\$1T). How much of this debt is “productive” according to my definition? Answer: most of it. The rate of return on owner occupied housing investment is highly dependent on the rate of housing price appreciation. Overall, housing prices are up at a 5% clip over the past year and I project continued positive low single digit gains. Rental rates are approximately 5% of home values. The sum of property taxes, insurance, utilities and maintenance expenses are estimated to be approximately 5% of the value of the typical home. The after-tax cost of mortgage debt is about 3%. Naturally, these calculations vary widely across regions, or even across communities within a region, but on average the expected return appears to exceed the cost of debt, even before attempting to quantify the social or community benefits of home ownership.

Likewise, student loan debt is generally productive if it leads to increased skills and credentials that enhance future income. While this is not true for all schools and programs, and probably not for those students who do not complete their degrees, the return to education appears to be quite high.

What about the ability to repay the debt? This depends on the characteristics of the individual and the individual’s income stream. If the income stream is stable and assured, like that of a tenured college professor, then greater leverage can be safely assumed. Also, individuals that are frugal can in principle devote a greater share of their income to debt service. Of course, frugal people tend to prefer low or zero levels of debt, and even if they choose to take on substantial debt, will tend to pay it off quickly (for example, see the essay “No More Harvard Debt”).

It is generally considered by credit experts that debt burdens (defined as monthly principal and interest payments divided by monthly income) greater than 40% are excessive. According to the SCF, in 2010 14% of households had excessive debt burdens. The median household has a debt burden slightly under 15%. Albert Einstein is reputed to have said that the most powerful force in the universe is compounding. Taking on productive debt can help to get that force working in your favor. However, taking on large amounts of unproductive debt means that the most powerful force in the universe is working against you.

An example of an unproductive debt would be carrying credit card balances in order to support discretionary consumer spending. Sure, you might derive a lot of pleasure from the consumption, but unless this is a very temporary position, your debt burden will grow rapidly.

The bottom line is that in the aggregate household debt levels are not unreasonable. However, about one in seven families carries an extremely heavy debt burden. This is a trap from which it is very difficult to escape.

## 4.2 NO MORE HARVARD DEBT

Joe Mihalic is a recent graduate from the Harvard Business School (HBS) who managed to pay off \$91,000 in student debt in seven months. He is currently enjoying his fifteen minutes of fame because he documented the details of his journey in a blog. His story is one of determination and commitment to a goal. Some of the strategies that Joe deployed in order to save money might seem a bit extreme, like taking a flask to bars in order to avoid buying drinks. But the principles that worked for him are simple and well known: make a budget, reduce base expenses, cut discretionary spending, take on a second job, take in renters, sell assets.

Is there a useful lesson in Joe's story for other graduates burdened with debt? At first glance, it might appear not to be so. Joe is among the elite, with an MBA from HBS (one of the most elite degrees possible) and a \$100,000+ job at Dell. Not only that, but at age 25 Joe owned 1 house, 2 cars and multiple motorcycles and bicycles. He also had two years of contributions to his company's 401K. This is a far cry from the median or typical college graduate with a job paying \$40,000 and no assets.

However, there are some parables that can be drawn lessons from Joe's experience that have broad applicability. The first is that if you are going to pay down debt or increase net worth you must spend less than you make. Sure, this is lot easier if you make \$100,000 than if you make \$40,000, but the principle is the same. After all, the guy making \$40,000 is far richer than 99.9% of all the people who have ever lived on the planet. Even today, at least one billion people make do with a family income of less than \$1,000 per year.

As an aside, I recently read a book<sup>1</sup> co-written by Esther Duflo who is a professor at MIT and the winner of a Genius award and the Bates Medal for the best economist under the age of 40. Professor Duflo's research focuses on people living in extreme poverty, defined at \$2 per day per person. About 1 billion people on the planet are currently in extreme poverty, and Duflo is studying how they live their lives in an effort to design policies or interventions that can reduce extreme poverty. It is remarkable how sophisticated and industrious these people are. In a sense, they have to be great risk managers because even a modest setback can be deadly. They learn to smooth consumption and insure against surprises by saving, even at \$2 per day!

If someone can save money on \$2 per day, then surely it is possible for nearly anyone in the US to increase their saving rate.

Second, you should evaluate the value of the benefits against the cost of the debt. Joe borrowed \$91,000 and gave up two years of earnings in order to pursue a Harvard MBA. Was it worthwhile? This depends on what he was making before. If his prior salary was also \$100,000, then the total cost of his MBA is \$91,000 in debt plus \$200,000 of foregone (pre-tax) income, and his benefit is zero (\$100,000 in Dell job less \$100,000 in prior job). This debt would not have been productive. More likely, however, Joes' prior income was well under \$100,000; let's assume it was \$70,000. In this case, the cost is \$91,000 plus \$140,000 of foregone income and the benefit is a growing stream beginning at \$30,000 per year. In all likelihood, Joe's return on the HBS investment will be much greater than the cost of the debt.

Of course, before the fact the return on the education investment was uncertain. If Joe had dropped out of HBS or if he did not land a good job the investment would not have turned out so well. The point is that high levels of debt create the possibility of financial distress, if things don't work out as planned.

To summarize, lesson number 1 is to consume less than you earn and lesson number 2 is that it is smart to borrow so long as the return is greater than the cost of funds, provided you don't borrow so much that the probability of distress is high.

## 4.3 CHALLENGING CONVENTIONAL WISDOM ON HOME OWNERSHIP

The Federal Reserve puts out two publications that address the level, change and composition of household net worth. The most widely known is the Household Balance Sheet table in the quarterly Flow of Funds (FOF) report. This report is released about two months after the end of a quarter. The FOF for the first quarter of 2012 was released last week and shows that total household net worth rose in the quarter from \$60 trillion to \$63 trillion. This aggregate is now nearly back to the pre-crisis peak of \$67 trillion, and is up 24% from the trough level of \$51 trillion reached back in 2009.

The big drop in net worth from 2007 to 2009 was due both to falling housing prices and falling stock prices, each of which was responsible for about half the decline in aggregate net worth. Since then the equity market has rebounded nicely but the housing market has not. This has caused significant distributional effects that are not really visible in the aggregate FOF numbers.



The second Fed publication on household finances is the Survey of Consumer Finances (SCF). The SCF is a triennial survey of approximately 6,000 families. The survey captures family characteristics including age and education of head of household as well as family income, assets and liabilities. Results from the 2010 survey show a large drop in median family real net worth from \$126,000 in 2007 to \$77,000 in 2010. Since the primary asset of the median household is their home, this decline in median net worth largely reflects falling home prices. And things probably have not improved much since then. Even though equity prices have risen since 2010, the median family equity holdings are pretty modest (less than \$50,000), so an improving stock market will not offset the drag from housing prices, which have continued to drift lower since 2010.

Thus, the SCF reveals a much less attractive picture than the FOF. Improving stock prices have pushed up the FOF measure of net worth. This is a good thing, and a positive leading indicator for economic activity. However, the SCF shows that the financial situation for most households has not improved much, if at all. The primary reason for this is the heavy concentration of residential housing in middle income family portfolios. Typically, young families build up savings in order to provide a down payment for purchase of a home. It has long been accepted wisdom that this should be so. This accepted wisdom is now subject to challenge in view of the miserable performance of housing prices over the past five years.

One of the unfortunate features of the housing price decline is that it reduces labor mobility. In a depressed housing market, it is difficult to sell your house in order to move to take advantage of job opportunities in a different city or state. This impairs recovery of the labor market. Retirement expert Moshe Milevsky argues<sup>1</sup> that home purchase should be postponed until the value of financial net worth approaches or exceeds the value of human capital. What he is getting at is that an individual's complete or economic balance sheet includes both financial assets and liabilities, as captured by the FOF and SCF, and human capital, which is the present value of future earnings. Young people have balance sheets dominated by human capital. Over time, as an individual ages and progresses in her career, the proportion of financial capital to human capital increases. Human capital is undiversified, illiquid and not tradable. According to Milevsky, it does not make sense to purchase another large asset that is undiversified and relatively illiquid, at least not until financial net worth has been built up.

Although this recommendation can be critiqued as looking through the rearview mirror, and maybe a little late for many people, it probably will gain traction in coming years. Supporting the argument is research by economist Robert Shiller who argues that investment in residential housing has not historically been a big winner. Shiller calculates that the average rate of home price appreciation over the past one hundred years or

more is just about the same as the overall inflation rate. In real terms housing price appreciation has been negative. Of course, this is not a return number because it ignores actual or imputed rental income on the positive side, and maintenance expenses on the negative side. The calculation also ignores the consumption value of owning your own home, and social and community benefits from a closer knit community. Still, Shiller's research and Milevsky's human capital argument both argue against concentrating your portfolio on residential housing. The case for buying your own home at the very first opportunity is not as compelling as has been widely believed in the past.

## 4.4 LARGE SCALE MORTGAGE REFINANCE

In his 2012 State of the Union<sup>1</sup> speech, President Obama laid out a new program to assist homeowners by enabling mass refinancing to the current very low level of mortgage rates. The Administration claims that tens of millions of families may benefit by this program with an average savings of around \$3,000 per year. The cost of the program is estimated by the Administration to be between \$5 and \$10 billion and is proposed to be covered by a tax on major banks.

This appears to be at least the third attempt to jump start large scale refinances. In 2010 the HARP (Home Affordable Refinance Plan) was launched with a prediction that it would enable refinancing for five million borrowers that were otherwise unable to refinance. There were many obstacles and fewer than one million families were able to successfully refinance. Then, in late 2011 the eligibility rules were eased in HARP II. And now we have HARP III.

Why is it proving difficult to achieve substantial refinances? There appear to be several reasons. One is simply that the plans, in particular HARP I and to a lesser extent HARP II, had eligibility criteria that sharply reduced the universe. These criteria included no delinquencies in the past six months, current loan-to-value above 80% and (in the case of HARP I) below 125%, origination of the underlying loan before 2009, etc. Second, the GSEs (Government Sponsored Enterprises, Freddie Mac and Fannie Mae) have applied substantial fee and rate add-ons that sharply reduced the benefit from refinance. Third, underwriting standards including documentation are very strict. Fourth, there are significant operational issues with mortgage servicers who are swamped with delinquent loans, foreclosures in process, and attempting to deal with multiple government refinance or modification programs.

## STREAMLINED PROGRAM

To address some of these obstacles, professors at the Columbia Business School<sup>1</sup> have proposed a simple yet comprehensive plan. This plan would allow any homeowner with a GSE mortgage to refinance his or her mortgage with a new mortgage at a fixed rate of 4.00% or below. The only requirement is that the homeowner be current on his or her current mortgage for at least three months. The underwriting process would be streamlined (and lenders on the new loans indemnified against “rep and warranty” violations), with no required appraisal or income verification.

The professors argue that lowering payments through mortgage finance is an important channel through which monetary policy is intended to assist the economy in difficult times. Yet today, thanks to various frictions including high GSE fees and falling home prices, this refinance channel has been effectively closed. Their proposal would reinstate the mortgage refinance channel.

Who would be the winners if this proposal comes to fruition? Clearly, qualifying homeowners would benefit. The professors estimate that 14 million homeowners would achieve an average payment reduction of \$2,600 per year. This is effectively a very large, and permanent, tax cut. Economists generally believe that the stimulative effect of permanent tax cuts is much greater than the effect of temporary tax cuts (like the payroll tax holiday currently in place).

The GSEs would benefit from large up-front fees from the new originations and the credit risk of these mortgages would be lower than the ones they replace. On the flip side, the GSEs hold large quantities of securities currently valued at premiums to par, and the price of these securities would fall. The professors estimate that the net effects on the GSEs would be positive.

Mortgage lenders and title companies would benefit from the new business. Taxpayers would benefit from reduced liabilities for the GSEs and improved housing market conditions and economic activity.

Who would bear the costs? The primary bearers of the costs would be holders of mortgage-backed securities (MBS). Assuming that investors simply replaced the securities that paid off with MBS constructed from the newly created loans, then the investors' yield would decline from 5-6% to something around 3%. Also, large mortgage servicers would incur declines in the value of their mortgage servicing rights.

Companies involved in mortgage lending would benefit while mortgage investors and servicers would lose. The large banks are heavily involved in each of these activities and the net effect for each bank would depend on the ratio of new loans generated to existing loans paid off.

## **BACKGROUND**

The ability to prepay a mortgage loan is a valuable option held by the mortgagor. Normally, when market interest rates fall dramatically, we would expect to see a huge surge of refinances as mortgagors take out a new lower rate loan and pay off the higher rate existing loan. But this process has been severely hampered in the current cycle thanks to falling housing prices and tighter loan underwriting.

The consequence has been a bonanza for owners of mortgage backed securities that are insured or guaranteed by the Federal Housing Administration or by Freddie Mac or Fannie Mae. The prices of such securities have skyrocketed due in large part to the refinance obstacles. Across the universe of agency MBS the average premium is seven points (that is, the average price is 107). If the ability to refinance were not constrained, the average premium would be cut in half.

Effectively, the Columbia plan will cause MBS to trade more or less like they would have absent the frictions currently impairing the refinance process.

## **POLICY**

There is a lot of debate about whether offering mortgage customers a call (prepayment) option is good policy. While highly valuable to the mortgagor, this call can create volatility in interest rates and requires extensive hedging by mortgage originators and investors. Irrespective of the arguments pro and con regarding offering the call option as a standard feature of mortgage loans, the fact is that most mortgages today have this call option and mortgage investors bought MBS knowing this call was in place.

The professors at Columbia argue that the mortgagor should own an additional option – the ability to repurchase his or her loan at a discount if interest rates rise or if credit quality worsens. Companies that issue marketable debt generally have this ability, why not homeowners as well? The effect would be to enable homeowners to build equity more rapidly and possibly reduce both interest rate risk and credit risk. It would reduce the effect of mortgage “lock in” where a borrower is reluctant to move if he holds a low rate mortgage during a period of high or rising interest rates. The ability to buy back your

mortgage at a discount would increase labor mobility and economic efficiency. So far as I am aware, this ability to repurchase your mortgage at a market discount is only currently available in the Danish mortgage market.

It seems to be working pretty well in Denmark. The Danish mortgage market is well established and highly stable. Indeed, housing prices in Denmark rose further and fell faster than they did in the US during the housing boom and bust, yet delinquencies and foreclosures in Denmark remained very low. It seems to me we ought to give the Danish model some further study.

## REFERENCES

- 1 Abhijit Banerjee and Esther Duflo, *Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty*, 2012.
- 2 Moshe Milevsky, *Your Money Milestones*, 2010.

# CHAPTER 5: INVESTMENT RETURN

## 5.1 EVERYONE IS A PORTFOLIO MANAGER NOW

Everyone is responsible for their own financial success. In the past, a combination of social security and company pensions provided a secure retirement for most people. However, in the past thirty years the proportion of workers covered by defined benefit pension plans has declined substantially and has been replaced by defined contribution plans, under which each participant is responsible for managing his or her own portfolio. You have to come up with reasonable investment strategies. A first step in doing so is to estimate future returns on the major asset classes – like equities, bonds and real estate.

Once you estimate expected returns on the alternative asset classes, the next step is to make the asset allocation decision – namely, what proportion of your portfolio do you want to allocate to each major asset class. This will depend on the expected returns and risks and also on your own degree of comfort with taking on investment risk. It is important to include the value of your future earning power, your human capital, in this calculation.

## 5.2 EXPECTED RETURNS

### GOODHART'S LAW AND EXPECTED RETURNS

#### Risk Premiums

In a terrific book published in 2011, Antti Ilmanen<sup>1</sup> has investigated the drivers of investment returns from a number of angles including asset class (that is, equities, fixed income, commodities), investment strategy (value, growth, momentum, leverage, carry), and risk driver (exposure to economic growth, inflation, liquidity). The basic idea is that you obtain strong investment returns either by taking exposure to sources of systematic risk or by taking advantage of mistakes of other investors. He documents a variety of investment strategies that have earned significant positive risk premiums (return above the risk free return) over the recent past. These strategies include the following:

- Holding long equity positions
- Emphasizing value stocks
- Emphasizing small capitalization stocks
- Momentum -- that is, riding the trend
- Selling volatility (selling options)
- Carry, or buying high yielding assets and shorting low yielding assets
- Supplying liquidity to the market by holding illiquid assets

## WHY DID THESE STRATEGIES WORK WELL IN THE PAST?

A key issue is whether the strategies reflect reward for taking on systematic risk or not. If they do, then there is reason to suspect that future returns will be strong. Unless, that is, the asset class or investment strategy becomes overcrowded.

Here we have another potential application of Goodhart's Law. Goodhart's Law (named after economist Charles Goodhart) says that once an observed empirical relationship begins to be relied upon, it will no longer be reliable. As investors learn about strategies that have worked well in the past, it is likely that some of them will attempt to copy the strategy and by doing so weaken the conditions that supported high historical returns.

For example, equities have done very well in the past 100 years, with annual (arithmetic) returns of approximately 11%. There are several partial explanations for this. First, equities were really cheap 100 years ago. Dividend yields were 5% (greater than corporate bond yields) compared to 2% today. Price/earnings ratios were significantly lower than today. The U.S. economy performed very well over this period, and we did not lose a major war nor incur a huge inflation. Based on initial conditions alone, it is likely that equity returns over the next few decades will lag behind the historical record.

Still, a fundamental principle of finance theory is that the overall stock market carries systematic risk and therefore the average stock investor will earn a risk premium in reward for taking on this risk. For many years, financial theory maintained that the market return was the only source of systematic risk. However, recently evidence has accumulated that support the idea of multiple risk factors. In particular, small stocks and value stocks (as indicated, for example, by low ratios of price per share to book value per share) have higher returns than large stocks or growth stocks. One interpretation for this is that both small size and low price indicate substantial exposure to an economic downturn, and that the higher returns on these strategies reflect this greater exposure. Similarly, the strategies of selling volatility (selling options), carry and holding illiquid assets each have a similar flavor – the investor earns insurance premiums for taking on a significant risk.

The one strategy that Ilmanen highlights that is not like selling insurance is momentum trading. The momentum trader buys when the price is rising and sells when it is falling. This is more like being long options than short options. The rationale for the success of this strategy, according to Ilmanen, is that it takes advantage of cognitive errors of other investors, like the error of holding on too long to losing investments.

## **WILL THESE STRATEGIES CONTINUE TO WORK IN THE FUTURE?**

Ilmanen describes three methods by which an investor can assess future returns. First, extrapolate historical returns. Second, utilize a model that assesses fair value. Buy when the asset is cheap, sell when it is dear. Finally, identify forward looking indicators of value, like price earnings multiples or yield curve slope. Each of these methods may fall victim to Goodhart's Law.

To see this, consider the case of hedge funds. Several of the strategies listed above are deployed by hedge funds. In recent years hedge funds have been able to report strong uncorrelated returns (positive "alpha") using strategies like option selling, trend following and carry. Yet, as the success of these strategies has become well known, more investors are attempting to achieve excess returns in the same ways. This is likely to render the strategies less effective. For example, option selling is a winning strategy so long as the volatility implied by option prices ("implied vol") is greater than the actual volatility of the price of the underlying instrument. But as more and more investors sell options, this is less likely to be true.

It would be useful to come up with indicators that would predict which historical rule is likely to work. For example, by monitoring the spread between actual and implied option volatility investors can assess the prospects for option buying or selling strategies. Of course, these "second level" indicators could become subject to the Law as well. This is why it is not easy running a successful hedge fund. The ability to consistently earn excess returns depends on having proprietary information or insights that are not, by definition, widely available. Over time, Goodhart's Law makes outperformance increasingly difficult.

## **ASSET ALLOCATION FOR MOM AND POP**

The individual investor has to answer a few important questions. First, what is his or her degree of risk aversion? The answer to this question should determine his or her exposure to risky assets. Second, what is the investor's time horizon? This will determine the selection of the risk free asset. For those investors with long-term horizons, the relevant risk free asset is a long duration bond (ideally, a long duration



bond that is indexed to inflation), not cash. Third, does the investor have specialized information that would be useful in determining when any of the generic strategies highlighted by Ilmanen are likely to perform well. Or, given his or her individual situation, is there a greater than average willingness to take on specific risks? Absent affirmative answers to either of the last two questions, the individual investor should probably stick with passive index or exchange traded funds that attempt to replicate broad asset classes.

### 5.3 IS DEMOGRAPHY DESTINY?

Economists assume that people attempt to smooth consumption over time. The data are consistent with this assumption. If you follow a cohort of people over a number of years, you will observe that their income will fluctuate a lot more than does their consumption. Income generally rises sharply early in peoples' careers, peaks out in middle age, declines gracefully toward retirement and then falls off substantially in retirement. Meanwhile, people go into debt when they are young to finance the purchase of education, durable goods (like a car) and a house. Then they begin saving a higher proportion of their income as income grows and they build a portfolio that is used to supplement income in retirement. This income supplement includes income off the portfolio and proceeds of the sale of assets.

If a generation is particularly large, like the baby boom generation, this consumption smoothing can have important effects on financial markets and economic activity. Large generations will tend to bid up the prices of assets during their accumulation years and then push asset prices down as they attempt to liquidate portfolios in later years.

Economists have indeed found strong correlations between demographic measures and economic activity and stock prices. For example, the baby boom spike in birthrates in the 1950s was followed 40 years later by a booming stock market and solid economic growth in the 1980s and 1990s (the 30-40 lag allowed the boomers to grow up to be big spenders and investors). Most early studies along this line have used a simple measure of the age distribution, like the ratio of the number of middle-aged people (40-49 years) to the number of older (>60 years) people (this is called the M/O factor) or the ratio of middle-aged to young (<30) (this is called the M/Y factor). Investigators have found strong positive correlation between the level of stock prices and M/Y or M/O.

One problem with this analysis is that the number of data points is pretty small. Major shifts in birthrate occur only every twenty years or so; therefore we have just a few useful data points over the past 100 years. It is hard to make a convincing argument using such a small sample. But, in an interesting piece recently published in the

Financial Analysts Journal<sup>1</sup>, investment researchers Robert Arnott and Denis Chaves attempt to address this data weakness by examining data on more than 200 countries. In addition to looking at many countries, Arnott and Chaves attempt to obtain a richer measure of the age distribution than using the simple M/Y or M/O ratios. While they would like to use the full set of age group variables (that is, the percentage of the population aged 20-29, 30-39, etc), they recognize that doing so would not enable precise estimates due to the high degree of correlation between the various age categories. So, they represent the age distribution using a low degree polynomial.

Specifically, Arnott and Chaves run regressions of five-year average growth and returns against measures of initial conditions and the age distribution as represented by a polynomial. The purpose of using five-year averages is to filter out transitory or so-called “high frequency” effects on growth and returns. The purpose of including a set of initial conditions (current growth for the growth equation, current bond yield for the bond equation and current price earnings ratio for the equity return equation) is to control for the state of the business cycle and current asset valuations.

## **RESULTS**

The major conclusions are consistent with prior research. The most favorable demographics conditions for economic growth are large numbers of people in their 30s and 40s. The most favorable demographic conditions for bond and stock returns are large numbers of people in their 50s. These results suggest that the impact of an aging population is first to slow the rate of economic growth, and subsequently to reduce investment returns.

Based on their regressions, Arnott and Chaves project dismal prospects for economic growth for Japan and much of Europe over the next decade or two. The growth outlook is not so good for the U.S. as well. On the other hand, growth prospects are pretty solid for much of Africa and South America. Likewise, return prospects are poor in Western Europe and Japan and solid in Mexico, South America and Northern Africa.

## **CAVEAT**

A major caveat is that there are many factors that affect economic growth and investment returns. The researchers attempt to adjust for these by using low frequency data and measures of initial conditions. But still, the results may easily be diluted by left out variable bias. Don't bet the ranch on these results. However, they do support the narrative that investment returns in the U.S. over the intermediate horizon (next ten to twenty years) are likely to be lower than historical returns. This means you have to save

more. It also suggests that investors should consider expanding their investment horizon to include emerging markets.

## 5.4 TIME DIVERSIFICATION AND HUMAN CAPITAL

A financial planning rule of thumb that you often hear is that the percentage allocation to safe assets (cash or bonds) should increase with age, and accordingly the percentage allocation to the risky asset (equities) should decline with age. One popular version is that your allocation to equities should be no higher than 100 minus your age. The idea here is that the older you are, the less time or opportunity you have to recover from a market downturn.

Another widely held tenet is that the longer your investment horizon, the greater should be your allocation to risky assets. The idea here is that the standard deviation of return declines with time.

These two ideas seem to be consistent; the older you are, in general the shorter your investment horizon.

However, economic theory is generally not supportive of the notion that your risky allocation should decline with age. Economist Paul Samuelson famously wrote<sup>1</sup> a demonstration of the error of this notion using words of only 1 syllable, so that everyone could understand him. The essence of the argument is that “When you lose – and you sure can lose – with  $N$  large, (note:  $N$  is the holding period) you can lose real big.” While it is true that the probability of loss declines with a longer holding period, the size of the potential loss rises. These two effects offset each other so that if you do not like an investment at a short-term horizon, you should not like it at a long-term horizon.

It is possible to reconcile these views by taking into account the effect of human capital. Human capital (HC) is defined to the present value today of future income. For a given individual, HC increases with education and experience, but eventually declines with age. A person’s total wealth is the sum of net holdings of tangible and financial assets (let’s call these net holdings “financial capital” or FC) and human capital. A young person’s wealth is typically dominated by human capital while a retired person’s wealth is entirely comprised of financial capital. Samuelson’s argument is that the ratio of risky assets to total wealth should be invariant to age.

In order to accomplish this, the stock weight in the financial portfolio must decline with age. This is because most occupations tend to be more bond-like than stock-like. Since the HC portfolio is bond-like and its relative weight declines with age, the weight on

stocks in the financial portfolio must decline with age in order to maintain a constant weight on stocks in the combined HC and financial portfolios.

If it is not age, what then does determine the optimal risky asset weight? The answer is expected return on the risky asset, the volatility of the risky asset, and your degree of risk aversion. In some formulations the optimal weight is proportional to the ratio of the expected excess return to the volatility, where the proportionality factor depends on the degree of risk aversion. This means every investor needs to come up with an estimate of expected return and volatility. Today many economists argue that likely future returns are materially lower than historical returns. This is most obvious in the case of Treasury bonds. Today the yield on long-term Treasuries is less than 3%. This means that the nominal return over the life of the bonds will be less than 3%, well below historical returns. Equities in turn have historically offered a return premium over default free bonds of approximately 6% per year. Even if that premium were to hold in the future, the total return would be lower due to the lower return on bonds.

Bill Gross, the Chief Investment Officer at bond giant PIMCO, claims<sup>2</sup> that the equity premium will be lower in the future due to slow growth in GDP. He asserts that if nominal GDP growth is 3% then stock returns cannot be greater than 3% in the long run, otherwise the value of stocks would explode relative to GDP. Mr. Gross seems to ignore the fact that one component of equity return is the amount of cash returned to the shareholder through dividends or stock buybacks. Indeed, this is historically the greatest component of long-term returns. Thus, the ratio of equity market capitalization to GDP can remain stable even as the equity return exceeds the rate of GDP growth.

Still, Mr. Gross' larger point is a good one – future returns on both stocks and bonds are likely to be lower than historical returns. According to standard asset allocation models, this means that the typical investor's optimal allocation to the risky asset is lower than it would be if expected returns were higher.

This has important ramifications for all investors. For example, in recent weeks the California Public Employees Retirement System (CALPERS) announced a 2011 portfolio return of 1%, well below its long-term target of 8%. While a one year deviation of actual return from target is not by itself all that big a deal, the fact that CALPERS continues to plan for 8% return in an environment that is very unlikely to produce such a return suggests that pressures on California's budget will increase substantially in the future as scheduled pension benefits outstrip investment returns.

And on a more modest level, the likelihood of lower future returns has important implications for individual investors as well. First, you have to save more than you

thought. Second, it may be too late, in which case you have to work longer than you thought. The good news is that you can extend the value of your HC by working longer or developing greater skills. This can be an important safety hatch if the value of your FC turns out to be less than anticipated.

## 5.5 HOW TO BECOME A BILLIONAIRE BY BILL ACKMAN

Hedge fund manager Bill Ackman has produced an interesting lecture on finance and investing. It can be found at [www.floatinguniversity.com](http://www.floatinguniversity.com). It is one of twelve lectures on “big ideas” currently residing on the site.

Ackman’s lecture, titled “All you need to know about finance and investing in less than one hour” and subtitled “How to become a billionaire,” begins with the business plan for a lemonade stand and includes formation of the company, initial capitalization and a set of five- year pro forma financial statements. The first year plan with one lemonade stand is discouraging, with 1% pre-tax margins and negative net income. However, based on assumptions of increasing unit sales and price per cup and expansion to seven lemonade stands, the five-year outlook is terrific. Year five profit is 100% of the equity investor’s initial outlay, and growth prospects are amazing. In fact, if you push the scenario out another ten years, based on Ackman’s assumptions, this lemonade business would be the most profitable business in the history of mankind.

The driving force behind the impressive projection is huge productivity growth; Ackman’s assumptions imply about ten percent greater sales per year per stand with the same inputs. Naturally, such a dynamic will generate phenomenal results. Ackman’s point is to show how financial statements work together, how to put together a business plan, and how to measure business performance. His lecture may be used by budding entrepreneurs to build a presentation for investors.

But his greater message is that value investing is a credible strategy for individual investors. Whereas the rate of return in the lemonade stand business is spectacular, Ackman argues that you don’t have to achieve such extraordinary returns in order to become wealthy, nor do you need to take the tremendous risks inherent in running a start up business. Instead, you can do very well investing in large established companies. He offers two main rules: first, start early and second, don’t lose money.

### START EARLY

Albert Einstein is reputed to have said that compounding is the most powerful force in the universe. But to get it to work for you, you have to start saving and investing early in

life. Ackman believes that non-professional investors can earn 10% a year using a long-term investing approach and a value discipline. Over 40 years, 10% annual return multiplies your initial investment by 60 times. If you were able to put away \$10,000 each year from your early twenties until retirement age, and earn a real return of 10% on these funds, then you can start with nothing and end up in the top 1% of the wealth distribution.

Before starting to invest, Ackman recommends paying off debt and building a cash reserve. If you have a lot of debt, then the miracle of compounding is working against you, until you pay off the debt.

## **DON'T LOSE MONEY**

Warren Buffett has been quoted as saying that the first rule of investment is to not lose money, and the second rule is to never forget the first rule. To Ackman, this means investing in well-established companies with a strong brand or other competitive advantage, little or no debt and no controlling shareholder. And, of course, do not overpay.

Naturally, investing in the equity market means that the value of your investment goes up and down. This volatility in price is what most people think of when they think of risk. This is not what Buffett and Ackman mean. To them, risk is the probability of loss, i.e., permanent impairment in your investment.

Ackman's advice assumes that you are interested in finance and willing to do some homework on your investments. If you are not interested or unwilling, then Ackman suggests considering using a professional money manager. He suggests looking for managers with a value orientation and long-term successful track record.

## **ACADEMIC ADVICE**

Most professors of finance and economics recommend a different investment strategy. Namely, you should maximize diversification and minimize fees. This means investing in one or more broad, passively managed index funds. The main rationale for this is the financial markets are assumed to be sufficiently efficient that it is very difficult for individuals, whether professional investors or not, to outperform the broad market averages. Many studies have confirmed that the bulk of professional money managers do not supply returns to their clients in excess of market returns. In a sense this is not surprising. After all, the majority of assets are managed by professional money managers so the aggregate return of such managers must be pretty close to market

returns, and after netting out management fees, returns to clients underperform the averages.

Sure, some managers consistently outperform, but it is very difficult to tell from historical data which ones are going to do that in the future. The remarkable thing is since that retail investors can obtain returns very close to market averages by investing in broad index funds, they are able to outperform the average of market professionals, even though they are not market experts themselves.

Obviously, Ackman would disagree with the academic consensus. He thinks that a disciplined value investor has an edge, and that by cutting out companies that do not meet his specifications, he increases the likelihood of outperforming the overall market. Yes, Bill appears to have an edge – the ability to identify solid companies that are priced at a discount to fair value. The key question is this: do you have an edge?

If you do, then you should pursue it. If you do not, or if you are not sure, then the passive index fund approach is probably a good way to go.

Bill Ackman is an extraordinarily successful portfolio manager and he has put together a great lecture that contains a lot of valuable advice. But, contrary to the somewhat tongue-in-cheek lecture title, there is more to learn.

## 5.6 SUSTAINABLE WEALTH INVESTMENT PLAN

The key to sustainable wealth is to tie your level of consumption spending to the product of your total wealth (including financial wealth and human capital, or the present value of future net income) and the after-tax real rate of return. If you do this, the affluence that you enjoy in your youth, due to the prospect of future earned income, will not be dissipated over time and you will have plenty of valuable options in your declining years, like supporting family member education or business pursuits, or charitable activities.

I have recommended that moderately risk tolerant people use 3% as a reasonable estimate of the future after-tax rate of return. Using this 3% rate to discount future income, I estimate total wealth to be approximately \$300 trillion for the US, or about 25 times aggregate disposable income. Thus, my consumption rule of 0.03 times wealth turns out to be equivalent to 0.75 times disposable income and thusly a personal savings rate of 25%. Since we observe savings rates closer to 5% of disposable income, it is clear that my Sustainable Wealth model is not a good descriptor of actual behavior. That's OK by me. The intent of the plan is not to explain what people actually do, but rather to provide one simple means by which to achieve a desirable financial objective.

Based on observed savings behavior, it seems very likely that many if not most people will be forced to significantly retrench their spending in retirement. Of course, it could be that realized investment returns will be much higher than the 3% I think is reasonable. Indeed, over the last 100 years or so equity returns in the US have been roughly on the order of 10% per year. So, what is wrong with extrapolating these results going forward? Well, there are a number of issues including: 1) the 10% actual return is nominal, pre-tax not real after-tax; the historical after-tax real return is closer to 5-6%, 2) most people would not be comfortable with a 100% allocation of financial capital to equities; a fifty/fifty equity/bond split would have generated a net real return more like 3-4%, 3) prospective returns today are probably lower than they have been on average over the past 100 years due to lower current dividend yields and slower economic growth, and higher current valuations, as indicated by relatively high current price earnings multiples. Each of these three factors suggests lower prospective equity returns. 4) Finally, as documented extensively by John Bogle, retail investors do not come close to achieving the returns offered by the market. This is due to a combination of bad timing and payment of large fees and costs for little or no benefit.

Whew. Maybe 3% is too high! In fact, achieving a 3% return is not like falling off a log. But I think that it can be achieved and one strategy for doing so is outlined below. The first question to ask is: do you have special investment skill? Some people do have such skill, but most do not. If you fall into the former category you should apply your skill, but if you like most people fall into the second category you should invest in low cost highly diversified index funds and you should refrain from active trading.

## **ASSET ALLOCATION FOR MOM AND POP**

Here is a simple five step plan.

- **Step one:**

Select one or more passive investment vehicles, like vanguard's total us stocks (symbol vti) or vanguard's total global stocks (symbol vt). This will be the "stock" portfolio.

- **Step two:**

Select a low-risk portfolio consisting of treasury securities, treasury inflation-indexed securities (tips) and money market funds. Call this the "bond" portfolio.

- **Step three:**



Through a process of self-reflection, assess your tolerance for return volatility. The greater your tolerance, the higher is your portfolio weight to equities. For young people, whose total wealth is primarily composed of human capital, you should follow retirement specialist Miles Milevsky and ask this question: “is your job more like a bond or a stock?” For most people, their jobs provide relatively steady income, like a bond. But some people, like actors or professional athletes, have very volatile incomes that are more like stocks. If your job is like a bond, you should consider a heavier equity allocation in your financial portfolio, and vice versa if your job is like a stock.

- **Step four:**

Suppose you determine that you are comfortable with a fifty/fifty allocation between the bond and stock portfolios. The next step is to set up a brokerage account and implement the strategy.

- **Step five:**

The next step is to wait. Once the stock market moves dramatically in one direction or the other, it may be time to take further action. If the stock market declines 50 percent, let's say, then on a market value basis your allocation to equities has declined from 50% to 33%. It is appropriate to “re-balance” by selling a portion of your bond portfolio and re-investing in the stock portfolio until you have re-established the initial fifty/fifty allocation (in this example, it would require liquidating about one quarter of the bond portfolio).

Similarly, if the stock market moves up dramatically, the re-balancing logic would suggest selling a portion of the stock portfolio in order to move back to the fifty/fifty split. The consequence of the rebalancing strategy is to force you to sell after prices rise and to buy after prices fall.

Finally, as you age and the financial portfolio becomes a greater percentage of total wealth, you should gradually decrease the allocation to equities in the financial portfolio. One rationale for this is that the older you are, the less time you have to recover from a market downturn. Also, to the extent your job is like a bond (probably the case for most people), the decline over time in the weight of human capital in total wealth means that your bond “allocation” is falling. So it is appropriate to offset this by carrying more bonds in the financial portfolio.

Bottom line, is this the best investment strategy ever devised? The answer is no. Almost surely you can do better if you have a real skill in economic forecasting or security analysis or manager selection. However, the strategy summarized here is easy to comprehend and deploy and it will keep you away from most of the debacles that seem to visit the average retail investor. In that sense, it is a major step forward.

## 5.7 SUMMARY AND CONCLUSION

The key to sustainable wealth is to tie your level of consumption spending to the product of your total wealth (including financial wealth and human capital, or the present value of future net income) and the after-tax real rate of return. If you do this, the affluence that you enjoy in your youth, due to the prospect of future earned income, will not be dissipated over time and you will have plenty of valuable options in your declining years, like supporting family member education or business pursuits, or charitable activities.

## REFERENCES

- 1 Antti Ilmanen, Expected Returns, Wiley, 2011.
- 2 Robert Arnott and Denis Chaves, "Demographic Change, Financial Markets, and the Economy," Financial Analysts Journal, January/February 2012.
- 3 Paul Samuelson, "Why we should not make mean log of wealth big though years to act are long," Journal of Banking and Finance, 1979.
- 4 Bill Gross, "Cult Figures," PIMCO, 2012.

# CHAPTER 6: RISK MANAGEMENT

## 6.1 BLACK SWANS

Even once we have established a completely coherent strategy with respect to spending, education investing and portfolio investing, there are still a lot of things that can go wrong. Major risks include mortality or the risk of dying too soon; longevity or the risk of dying too late; job loss or job obsolescence or disability; the risk of falling market prices; the risk of falling prey to some investment scam; the risk of social collapse and chaos.

Some of these risks have been addressed in the basic plan. The Sustainable Spending Rule is designed to prevent deterioration of financial wealth over time. Thus, if your income projection turns out to be too optimistic, or your realized investment return falls short of forecast, or if you are so fortunate as to outlive your life expectancy, there is a cushion built into the Rule that will soften or even eliminate negative effects on your ability to consume.

In other words, we are starting with a plan that is “robust” (or “anti-fragile” in the terminology of Naseem Taleb, see Chapter 6.7). This cushion is bolstered by making conservative assumptions regarding future income and investment return, as discussed in Chapters 2 and 3.

In addition, it is appropriate to deploy risk management strategies to further protect against extreme events. There are innumerable scenarios. But the bottom line is that extreme events occur more frequently than our training and intuition lead us to expect.

## 6.2 RETRENCHMENT RULE

Gordon Pye was a finance professor at UC Berkeley in the 1970s. Then he became Chief Economist at a bank in New York City. After ten years or so, the bank was acquired by another bank that already had a Chief Economist. So Professor Pye took early retirement and began to contemplate the appropriate rule for retirement spending. The state of the art in financial planning is the “4% Rule” that says you can 4% of your portfolio in the first year of retirement and then maintain that real level of spending

throughout retirement. The author of this rule, William Bengen, calculated that it was highly likely, based on historical experience, that this rule would be sustainable over a 30 year retirement period (that is, it was highly likely that the portfolio would not be completely dissipated).

Of course, Pye's problem was a little different in that he was retiring early. Also, like Mr. Bengen, Professor Pye had significant analytical skills and he applied them to this problem. What he discovered is what he calls the Retrenchment Rule<sup>1</sup>. The basic idea is to identify the optimal level of spending in retirement, avoiding as much as possible painful reductions in spending either at retirement or thereafter. Pye refers to such reductions in spending as "retrenchment."

## THE RULE

The first step is to estimate portfolio withdrawal amounts that preserve pre-retirement living standards. Call this the "Desired Withdrawal Amount" (DWA). The second step is to select a discount rate, called the "Retrenchment Discount Rate" (RDR) that provides the "optimal retrenchment." Pye's working assumption is that most people will be faced with retrenchment in retirement. The key to optimal retrenchment is to avoid a sharp and painful drop in living standards, particularly at the retirement date. Pye's recommendation is to select an RDR in the range 6-8%.

The second step is to determine annual spending as the minimum of the DWA and a fixed annuity calculation based on your current wealth, your remaining lifetime and the RDR. That is, the annuity calculation is to find the constant annual payment that can be made over your remaining lifetime given the discount rate and current portfolio (using your financial calculator,  $N$  is your remaining lifetime (110 minus current age),  $I$  is the RDR,  $PV$  is your current portfolio, then push  $PMT$ ).

Finally, at the start of each year as you proceed through retirement, you re-compute the fixed annuity given the RDR, the remaining number of years until age 110, and the current portfolio amount, which will be dissipated by the prior year withdrawal but expanded by investment returns over the course of the year. Your spending for the year is the minimum of last year's spending and the fixed annuity calculation.

Whew!

After exhaustive simulations, using an assumed probability model for investment returns, Pye concludes that the Retrenchment rule, using an RDR of 6% or 8%, offers the optimum retirement spending plan. It is much more generous in the early years than the

Bengen plan. For example, using an RDR of 8% implies a portfolio withdrawal rate of 7.5% in the first year, nearly double the Bengen 4% rule. However, the cost of this is that down the road the probability is high that there will be further retrenchment. This might be prevented by positive investment returns but even if not, Pye believes retrenchment is much more easily accommodated if it takes place gradually over many years rather than immediately upon retirement.

## **ASSESSMENT OF THE RETRENCHMENT RULE**

This is good advice for those people who have not saved enough to avoid the strong likelihood of significant retrenchment in spending during the retirement years. But I think a better strategy is to not get yourself into a situation where you face serious retrenchment. That means saving more and spending less in the working years, and careful management of your investment portfolio.

A simple way to accomplish this is to keep spending as a share of wealth (where wealth includes the value of human capital) no greater than the after-tax real rate of return. How do you do this? I'm glad you asked. The answer is the Sustainable Spending Rule. It applies to equally well to people in retirement and to people that are currently working.

## **THE SUSTAINABLE SPENDING RULE (SSR)**

- STEP 1:

Estimate the after-tax real rate of return,  $\delta$

- STEP 2:

Measure total wealth,  $W$ , including financial capital and human capital

- STEP 3:

Set consumption spending =  $\delta * W$

The key to the SSR is the choice of the rate of return  $\delta$ . Unlike Pye's RDR which is selected in order to obtain a desirable retrenchment path, the SSR  $\delta$  is a projected rate of return. To really be sustainable, this projection should be conservative or at least realistic, not optimistic. In my view, in today's environment 3% is the highest after-tax real return that is reasonable (actually, my preferred implementation of the rule, the Speakes Sustainable Spending Rule (SSSR), uses an assumed rate of return equal to 1%)

By following the SSR (with a reasonable return assumption) you will have no need to reduce your consumption spending in retirement, you will have a cushion to handle unexpected events, and you will probably be able leave a bequest for your heirs to put to some productive use.

*An example:*

*Take the median household, with \$50,000 in after-tax income, 40 year-old breadwinner, and \$150,000 of financial net worth including home equity. Assuming an after-tax real return of 3%, total wealth is approximately \$1.25 million and the SSR calls for consumption spending of \$37,500. This is 75% of disposable income leaving a savings rate of 25%.*

*Naturally, not all households will follow the SSR. But suppose they did, what would be the macro consequences? First, the overall savings rate would rise a lot, by approximately five times (that is, personal consumption spending as a fraction of disposable income would increase from the current 5% level to something closer to 25%). Consumption (and imports) would decline and investment would increase. Capital goods industries would boom and consumer goods industries would slow down, at least for a while. Over time, the capital stock would rise rapidly and the rate of productivity growth would increase.*

*Why won't most people follow this advice? I think there are several answers, but the key ones are impatience and over-confidence. People are impatient and this leads them to consume almost all of their disposable income. Also, people are inherently optimistic and prone to over-estimate the likely return on investment. For example, if our median household had assumed a 5% after-tax real return, then total wealth would have been estimated at \$980,000 and 5% of wealth means consumption of \$49,000 and a savings rate of 2%. This is pretty close to the norm. In effect, everyone is following an SSR-like rule, but most people are over-estimating the rate of return.*

## 6.3 RATCHET RULE

In earlier chapters we have discussed the components of building a sustainable financial plan. There were two key steps: first, take into account your “human capital” which is the present value of your estimated future income stream. Your total wealth is the sum of this human capital and your net financial capital (assets less liabilities, also known as “net worth”). Young people’s wealth is generally dominated by their human capital while for people near or in retirement, financial capital is the primary component of wealth. The

second step of the sustainable financial plan is to make sure that you don't allow your total wealth to dissipate over time. This means making additions to financial capital sufficient to offset the decrement in human capital as you age. To accomplish this, I proposed the Sustainable Spending Rule (SSR) where consumption spending is set at a fraction of total wealth, where the fraction of wealth is the expected after tax real rate of return on investment and total wealth includes both human capital and financial capital. I claimed that this spending rule is sustainable in the sense that the probability of outliving your assets is close to zero. In fact, if the actual return equals the expected return, then according to this rule, real wealth will not decline at all. This is because the investment return will exactly match the amount of consumption spending (for the geeks, Wealth at end of year equals Wealth at beginning plus investment return minus consumption, or  $W(t) = W(t-1) * (1 + \delta) - C = W(t-1) * (1 + \delta - \delta) = W(t-1)$  where  $W(t)$  is Wealth at time  $t$ ,  $C$  is consumption and  $\delta$  is the expected real after-tax rate of return).

However, we also want consumption to be smooth over time. If the actual investment return is volatile, then wealth will be volatile and so will consumption. To create a smoothed consumption path, we need to supplement the SSR with two modifications, the Retrenchment Rule and the Ratchet Rule.

The Retrenchment Rule was first proposed by economist Gordon Pye and was discussed in the previous essay. Suppose we denote wealth today as  $W(0)$  and over the next year we spend  $C(0) = \delta W(0)$ . If wealth next period ( $W(1)$ ) falls then consumption will fall as well, according to simple application of the SSR. This drop in consumption is what Pye calls "retrenchment." The effect of his optimal retrenchment is to cushion this decline in consumption. After all, it is possible, even likely, that realized investment returns will be higher in some future periods, so the full decline in consumption spending as indicated by straightforward application of the SSR is not necessary. The version of the retrenchment rule that I propose is as follows: consumption in the subsequent year should be the minimum of consumption in the prior year and the amount of a fixed annuity calculated using current wealth and a conservative estimate of mortality (let's say, age 110). In EXCEL this calculation is  $PMT(DR, 110 - \text{Age}, \text{Wealth} * -1)$  where  $DR$  is the discount rate,  $\text{Age}$  is current age and  $\text{Wealth}$  is Wealth. In Pye's "official" version, the discount rate is chosen to obtain the "optimal" amount of retrenchment. In my version, the discount rate is  $\delta$ , the expected real after-tax return. The effect of the retrenchment rule is to cushion consumption against unnecessary declines in the face of temporary drops in wealth.

This fixed annuity concept is essentially the same thing as "permanent income" which was famously introduced by economist Milton Friedman over fifty years ago. In his "Permanent Income Hypothesis" (PIH), Friedman hypothesized that people spend a

constant fraction of their permanent income. Of course, permanent income is not really permanent; it varies with changes in wages or investment returns. However, it is much more stable than observed income which includes random or “transitory” shocks. Friedman’s PIH is a theory of what people do; my SSR is a proposal for what people ought to do.

Conversely, suppose the actual investment return exceeds the expected return. This means wealth rises in the period and simple application of the SSR would call for increased consumption. But this may not be consistent with the goal of smoothed consumption. Surely, if wealth moves sharply higher we can afford to increase consumption, but we want to do so in a stable way (so as to make sure that the increase is sustainable). The method I propose for doing this is the Ratchet Rule. The Ratchet Rule is simply the SSR using a more conservative (lower) estimate of the expected return. I recommend using 1% for this calculation. You can certainly afford to spend 1% of your wealth each year. The 1% Ratchet Rule states that consumption during a period is the maximum of consumption last period or one percent of wealth.

Let’s suppose your estimate of real after-tax returns is 3%. This means that consumption in the year that you implement the SSR is three percent of current wealth. The 1% ratchet rule says that you will maintain this same level of spending until your wealth triples. You could consider variations of the ratchet rule using different minimum rates of return, but I think one percent is a great way to go.

## **APPLICATION OF THE RULE**

For capital market assumptions consider one risky asset (equities) with expected real after-tax return equal to 6% and annualized volatility 20% and one risk-free asset (for example, Treasury Inflation Indexed debt) with real after tax return equal to 0%.

Assuming an asset allocation of 50% to the risky asset and 50% to the risk free asset, the expected portfolio return is 3%. Using this “discount rate” we estimate total wealth for each household including the present value of future earnings and the present value of social security. Consumption for this first period (after implementation of the plan) is set at 3% of the current value of total wealth (call this “initial consumption”). Then, we consider shocks to actual investment return. If the return is lower than 3% we select next period consumption as the minimum of initial consumption and the fixed annuity  $PMT(3\%, 110-\text{Age}, \text{Wealth}^*-1)$ . If the return is greater than 3%, we select next period consumption as the greater of initial consumption and  $.01 * \text{Wealth}$ .



We can imagine conducting this exercise at the end of each calendar year to determine the subsequent year spending amount. I have conducted extensive simulations of this rule and find that it holds up well against major fluctuations in market returns.

To take one example, consider the median household, with head of household age 40, current income \$55,000 which is expected to increase in real terms by 50% over the next 20 years, and financial net worth (including home equity but not human capital) of \$175,000. Assuming planned retirement at 65 and social security of \$21,000 per year in today's dollars, and using a 3% real discount rate, I calculate total wealth to be approximately \$1,600,000. Application of the SSR produces consumption spending of 3% of wealth or \$48,000 (and a personal savings rate of  $13\% = 1 - 48,000/55,000$ ). What is the risk of retrenchment? The Retrenchment Rule annuity (permanent income) is approximately \$55,000 so that if total wealth falls by more than 13% then consumption must be reduced. However, given that risky equities only comprise 5.5% of total wealth (financial capital is 11% ( $175,000/1,600,000$ ) of total wealth, and we have assumed a 50% allocation of financial capital to the risky asset), it is next to impossible for a market downturn to trigger retrenchment. Naturally, a retiree's wealth would be more dominated by financial capital, so a heavy allocation to equities would create some risk of retrenchment.

## **PERSONAL SAVINGS RATE**

In the example above, the personal savings rate under the SSR for the median household was 13%. What is the implication of the SSR for conventionally measured personal savings rates? This obviously varies widely depending on the extent of your financial capital and the probable future growth rate of wage or salary income. If you have significant assets or rapid expected income growth, then your SSR savings rate today could be very small, even negative. However, on average across all households, I estimate that application of the SSR would generate an average savings rate of about 25%, or roughly four or five times what we observe today.

The upside of this higher savings rate would be that the economic prospects for your children would be a lot better as the stock of capital would grow more rapidly. The "downside" is that you will in all likelihood be left with positive wealth in your declining years. This "excess" wealth represents consumption that you will have foregone. To many economists this is a bad thing. But another way of looking at it is that you will have significant protection against adverse outcomes, while promoting a social good (more capital).

## 6.4 GIFT OF A LIFETIME

T. Boone Pickens is famous as an oilman, corporate raider and energy investor. He is also a graduate of Oklahoma State University (OSU) and an avid supporter of the University and its athletic programs. Reportedly, he has donated nearly \$500 million to support various OSU initiatives. About five years ago he had the bright idea of convincing fellow alums to allow the University to buy individual life insurance policies on them with the beneficiary being the OSU athletic endowment fund (Cowboy Athletics). Apparently 27 fellow alums signed up for the program, with total death payouts over \$300 million.

The University planned to take out a large loan in order to pay the premiums on the policies, and Pickens pledged to pay the interest on the loan, at least initially. This looked like a no-brainer for OSU, and similar ideas have been pitched to other universities and foundations.

But, does it really make sense? The OSU policies were written by life insurer Lincoln National (LN). Since LN is in the business of making a profit in writing life policies, why would anyone think that the aggregate premiums charged for the policies would be materially less than aggregate policy payouts?

Life insurance is an extremely useful and valuable product for many people. If you have dependents relying on your income stream, and you have sizable human capital (future wage income), and you have modest financial capital (financial assets in excess of debt), then you are a good candidate for a life insurance policy. The basic idea is to insure the value of your human capital. The most obvious candidates are people in early middle age with young families. As time passes, the need for life insurance for the typical individual recedes. You no longer need life insurance once any of the following events occurs: a) your children grow up and leave home (you no longer have dependents), b) you approach your own retirement (your human capital becomes small), or c) you build up sizable financial capital.

Of course, there are viable uses of life insurance for some elderly people. For example, suppose you own a private business or property that would be subject to significant estate tax and that you'd like to keep in the family. If you don't have sufficient liquid assets to pay the estate tax, your heirs may have to sell the business or property in order to pay the tax. In this case, it might make sense to buy a life policy with a payout upon your death that covers the projected estate tax. But, this surely is a small part of the overall life business.

## COWBOY ATHLETICS

It appears that the appeal of the Gift of a Lifetime strategy to OSU was that it appeared to be self-funding. After T. Boone picked up the interest on an OSU loan for a few years, the insured alumni would begin to pass away and policy proceeds would be large enough to cover the premiums.

A related issue was that prior T. Boone gifts that had not yet been spent were invested in the T. Boone Pickens energy hedge fund (BP Capital Management). The value of the OSU holdings in this fund served as collateral for the loan to pay insurance premiums. While this fund was doing great in 2005 and 2006, when performance deteriorated dramatically in 2008 and 2009 the value of the OSU holdings cratered.

Not only did the value of the collateral decline, none of the insured alum died. With no policy proceeds coming in, the endowment committee was forced to pay premiums directly. After three years and \$33 million, the committee pulled the plug and cancelled the policies.

Then litigation ensued between OSU, T. Boone, LN and various insurance brokers.

Are there any useful lessons in this saga?

First, while there are many useful applications of life insurance, there are other not-so-useful applications. Second, even though mortality rates are predictable in large samples, you cannot accurately predict mortality rates in small samples. Third, don't try and outsmart experts on their own turf. Fourth, if it looks to be too good to be true, it probably is not true.

## 6.5 SIX PERCENT A MONTH

On Saturday mornings in my local area, there is an AM radio program featuring a particular investment strategy that the hosts (sponsors) assert can and has earned six percent per month for clients. As best as I can tell from the description (the listener is advised to call in or attend periodic seminars for more information), the basic strategy is covered call writing. While there are many advocates and devotees of the covered call write strategy, six percent per month sounds extreme. Accumulated over the course of a year, this implies pre-tax returns of 100%. What is the likelihood that a covered call writing strategy can earn these returns? And if this likelihood is small, what is the justification for the claim?

Suppose the strategy is as follows (again, I'm not sure that this is exactly the strategy proposed by the radio hosts, I have not taken the seminar): at the start of every month we take our portfolio of stocks and for each stock seek to find a one month call option with premium equal to six percent of the current value. Since there are a variety of strikes for each stock, there probably will be a strike with premium fairly close to the six percent target. Naturally, for stocks that are not very volatile, the strike may have to be deep in the money. Even for volatile stocks, the strike is likely to be at least slightly in the money. Anyway, after identifying the strike, we short one call for each share we own. At the end of the month, if the stock price winds up above the strike, the calls will be exercised. In this case, we take the proceeds from the sale and reinvest in the same stock and write more calls at the start of the next month. The monthly return will be six percent less the percent discount of the strike to the initial price. If the stock price falls and the call is not exercised, then at the start of the next month we again seek to find a call with premium near six percent of the (now lower) stock price. Naturally, the strike for the second month's calls will be lower than it was for the first month's calls.

What is the likely return over time of this strategy? It is true that each month the strategy earns option premiums of approximately six percent of the value of the portfolio. But in the case of a falling stock price, the total return is less than six percent (including depreciation of the value of the stock) and the subsequent month's six percent will be on a lower balance. If the stock price rises and the calls are exercised, the total return for the month will depend on the strike. If it was at-the-money then the proceeds from the exercise and the call premiums do provide a six percent return. But this is a fairly unlikely scenario inasmuch as there are very few stocks that are so volatile that at-the-money or in-the-money one-month strikes are selling for a premium of six percent of the stock price. More likely is the case that proceeds from exercise combined with the option premium amount to less than six percent.

This strategy will most likely not deliver a total return of six percent per month. If you focus purely on the option premium earnings, the six percent a month claim may be reasonable. But this is not total return. In order to evaluate the program it is important to evaluate its performance over a variety of stock price scenarios and keep track of the total value of the portfolio in each scenario. This analysis should be done but may not be provided by the product vendor. Investors must do it themselves or rely on a third party independent expert.

This lesson has broad applicability. Financial products are often quite complex and it is difficult to fully identify potential benefits and risks. The vendors generally have informational advantages and may choose to paint a rosy picture of the likely outcomes. It is important for consumers to learn to ask the proper questions or carry out the

analysis to accurately assess the costs, benefits and risks of a particular product. Lacking sufficient expertise to do this, it would be desirable to have access to third party experts to provide independent assessments. Naturally, financial planners can fill this role. But you have to know enough to identify an appropriate advisor.

Another potential source of such information is regulatory consumer protection. For example, a stated goal of the new Consumer Financial Protection Bureau<sup>1</sup> (CFPB) is to promote simplicity and transparency in financial products (the primary focus of the CFPB appears to be credit and deposit products, not investment products). The plan to achieve simplicity and transparency includes restructuring mandatory disclosures to be shorter and easier to read and understand. Perhaps the CFPB mission will be expanded to include product testing. Stress testing products to assess their resilience under a range of economic scenarios is a way to improve transparency.

Ultimately, the best solution is for the consumer to develop a level of financial sophistication and expertise. Toward this end, the Dodd-Frank Wall Street Reform and Consumer Protection Act (DFWSRACPA) mandated creation of the Office of Financial Education (OFE). According to Ms. Warren, the OFE will develop and improve educational materials and create tools that “enable consumers to understand and assess the total costs and potential risks of different products.” It is not clear whether the OFE will cover investment products, or if that responsibility will remain with the SEC. Either way, the stated mission of the OFE seems a worthy one.

## 6.6 GOOD DERIVATIVE, BAD DERIVATIVE

Some financial innovations are good ideas and make large contributions to economic growth and prosperity. Others are not so good and can lead to bad outcomes including excessive leverage, financial fragility and even financial crises. Economists Posner and Weyl<sup>1</sup> suggest that it is possible to assess the potential benefits and costs for new financial products “ex ante”, that is, before they are introduced to the market. They propose establishment of the “Financial Products Agency” (FPA), a government entity that will have the authority and responsibility to evaluate and approve or deny new financial products, much like the FDA has with new drugs. The purpose of the FPA would be to prevent potentially dangerous financial products from being released on the market.

The main test proposed by Posner and Weyl is whether the proposed financial product would be primarily used for risk management or hedging, which is good, or for speculation, which in their view is bad. Financial products that already exist will be grandfathered, just as were drugs already in existence when the FDA was created. The

authors speculate whether various current financial products would or should have been approved, had the FPA been in operation at the time they were introduced. For example, the authors believe that life insurance policies purchased by a breadwinner on his or her own life would have been approved. But life insurance policies purchased on a third party would not have been approved. In the former case there is an “insurable interest” and in the latter case there is not. To take another example, the authors believe that put and call options on individual stocks are primarily used for betting and would not have been approved by the FPA.

I agree that in principle assessment of the quality of a new financial product is a good idea. Poorly designed products can cause great hardship. Financial products can be very complex and difficult for users to assess. There is a great informational advantage favoring sales people over customers. The negative effects of financial products may take many years to show up, during which time they may have become disseminated widely. If we could isolate a new product and examine how it would work in various environments perhaps we could prevent negative financial innovations from moving forward.

But the FDA analogy is not compelling. Drug testing utilizes the concept of controlled experiments, where one group (the treatment group) receives the new drug and another group (control group) does not. Then the health outcomes of the treatment and control group are compared. While the process can be quite lengthy, it is based on sound statistical theory. This does not mean that no errors are made. Indeed, the FDA can make two types of errors. First, they can keep a sound drug off the market. Second, they can approve a bad drug for the market. FDA officials probably worry more about the consequences of the second type of error, and therefore lean towards making more errors of the first type.

The FPA would not have the benefit of running controlled experiments. They would have to conduct thought experiments. Posner and Weyl propose to measure the likely hedging and speculative demands for a given product. What risks can this product address? How great are these risks? Are there other methods for addressing these risks? Similarly, they propose similar questions to address the likely speculative demand. If the speculative demand exceeds the likely hedge demand, then the product would not be allowed.

One problem I see is the assumption that speculation is per se bad. On the other side of every hedge transaction you will find a speculator. Thus, even a contract that has huge hedge interest will have 50% speculator usage. There is a long history in economics that sees a positive economic role for speculation. Rather than being a drag on the economy,

speculators contribute to improved economic outcomes by providing liquidity to hedgers, increasing information flows and lowering transaction costs.

A strong advocate of the benefits of innovation in derivatives markets is Richard Sandor who as chief economist for the Chicago Board of Trade was instrumental in the design and implementation of financial futures and options contracts in the 1970s and 1980s. Professor Sandor has recently published an autobiography<sup>2</sup> in which he details his forty-year experience in futures market design. He takes the reader through the development process both for contracts that succeeded and others that failed. This development process is detailed and painstaking. He concludes that necessary conditions for a successful product include first a fundamental hedging need, but also contract standardization, trading on an exchange, clear ownership rights, transparency, and liquidity provided by market makers and speculators. This is the definition of a good derivative. A bad derivative would be one that does not have these characteristics.

I was particularly intrigued with Professor Sandor's story because in a former life my hedge team was one the largest users on the planet of Treasury Note and Treasury Bond futures and options contracts. I had not been aware that since 1990, Professor Sandor's efforts have been concentrated on developing markets for trading toxic emissions and other environmental products. His effort along this line is a great topic for another series of essays.

## 6.7 ANTI-FRAGILITY

In early 2007, before the financial crisis hit, author Naseem Taleb published his best-selling book "The Black Swan" in which he argued that extreme events occur more frequently than most of us are trained to expect. We are trained to think in terms of the "normal" distribution, or bell-shaped curve, in which events more than three or four standard deviations from the mean are wildly unlikely. Yet, every few years in the financial markets we observe a six or ten (or, in the case of the stock market crash in October 1987, a twenty) standard deviation event. These repeating occurrences should have completely disabused us of the notion that normal probability rules apply to financial markets. But it does not that appear that this is the case.

Taleb's contribution in the Black Swan was to offer an explanation for why extreme events occur more frequently than we expect and a suggestion for what we should do about it. He distinguished between what he called "Mediocrastran" – the world in which the normal curve works – and "Extremistan" – the world in which it does not. He showed that in this latter work, probabilities are driven by so-called "power laws." A simple example of a power law is the famous 80/20 rule, invented by French economist Pareto

to describe land ownership in France in the late 19th century (20% of the families owned 80% of the land, and 20% of the 20% owned 80% of the 80%, etc.).

Taleb argues that the effects of winner-take-all technologies and globalization mean that more and more phenomena are falling into the Extremistan world. In order to survive and thrive in this world, you must on the lookout for negative Black Swans (that is, extreme events that are harmful to you) and seek to minimize exposure to them. Also, you should be on the lookout for positive Black Swans (extreme events that improve your position) and seek to increase exposure to them.

As mentioned above, Taleb described these ideas before onset of the financial crisis. It would have been highly beneficial for market participants, for example mortgage investors, to have applied these ideas. A negative Black Swan for mortgage investors is a huge drop in housing prices. One way to mitigate exposure to this event would have been to purchase protection in the form of mortgage credit derivatives, or to sell mortgage exposure. As described in Michael Lewis' entertaining book "The Big Short," a few investors did precisely that, but not many.

In his latest book "Antifragility," Taleb pushes these ideas forward by distinguishing between phenomena that are hurt by disorder from those that are benefited by disorder. You are fragile if you are impaired by an increase in volatility. You are "anti-fragile" if you are benefited by an increase in volatility. A great example of anti-fragility is evolution. The process of natural selection is enhanced by greater variation in genetic characteristics. Other examples of anti-fragility include bottom up decision making, local governments, and trial and error experimentation.

Examples of fragile systems include large corporations, central governments, top down planning, large indebtedness and conventional risk management. Taleb predicts that fragile systems will eventually blow up and fail.

How can you tell if a system is fragile or not? Taleb, who began his career as an options trader, argues that it comes down to whether you are "long options" (you own them) or are "short options" (you have sold them). Recall that an option is the right but not the obligation to buy or sell a commodity at a specified price. The payoff to a long option positive is positive or zero. The payoff to a short option position is negative or zero. The option seller receives cash up front and is benefited by little or no movement in the price of the underlying commodity. The option buyer pays cash up front and is benefited by greater movement in the underlying price.



In financial markets, options prices can be bid up to very high levels, so that it appears to be more attractive to sell them than to buy them. Thus, many investors and financial companies actively manage positions in which they sell (what they think are) overpriced options. Taleb believes these types of positions are inherently fragile and will eventually blow up. He prefers to own what he calls “barbell” positions which are made up of combinations of unlike positions, like 90% cash and 10% long out-of-the-money options. The typical performance of this type of position will be a modest or even small negative return, but periodically there will be a very large positive return.

To measure fragility, Taleb proposes that you estimate the performance of your strategy or position across an array of shocks to the underlying value drivers. If you plot these outcomes and the shape is like a frown (big losses with large shocks), then you are fragile. If the shape is like a smile (bigger gains with larger shocks), then you are anti-fragile.

## **APPLICATION: PERSONAL FINANCIAL PLANNING**

Suppose we define a financial plan as a lifetime path of consumption such that its discounted present value is less than or equal to the discounted present value of resources including future income and current wealth. To prepare such a plan includes making a monumental set of assumptions about future wages, rates of return on investment, retirement timetable and other factors. Naturally, those forecasts are going to turn out to be incorrect, perhaps wildly incorrect. Periodically, those projections will have to be updated. A fragile financial plan is one in which the original consumption plan turns out to be infeasible under the revised projections. On the other hand, a sustainable (non-fragile) plan is one which has sufficient cushion such that revised projections do not jeopardize the path of consumption.

### **Characteristics of a fragile plan:**

- Low savings rate
- High assumed future investment returns
- High assumed growth in real wages
- Big debt levels
- Low amounts of insurance (health, life, property)

### **Characteristics of a sustainable plan:**

- High savings rates
- Modest assumed future investment returns

- Modest assumed wage growth
- Modest debt levels
- Sizeable amounts of insurance

It is clearly desirable to put into place a sustainable plan, so that the chance of wrenching downward adjustment in the future is minimized. The way to accomplish this is pretty simple – make conservative assumptions. But, people have a hard time doing this. Impatience leads to greater immediate consumption and lower savings. Over-confidence leads to aggressive assumptions about future wage growth and investment returns. The combination results in a fragile plan.

## REFERENCES

- 1 Gordon Pye, “The Retrenchment Rule,” GPB Press, 2012.
- 2 Testimony of Elizabeth Warren before the House Subcommittee on Financial Institutions, March 16, 2011.
- 3 Eric Posner and Glen Weyl, “An FDA for Financial Instruments,” University of Chicago Working Paper No. 589, February, 2012.
- 4 Richard Sandor, Good Derivatives, Bad Derivatives, Wiley, 2012.
- 5 Naseem Taleb, Antifragility, Wiley, 2012.

# CHAPTER 7: CASE STUDIES

## 7.1 NBA SUPERSTAR

The bankruptcy rate for professional athletes just a few years from retirement is extremely high. To take one example, 60% of NBA players are reported to become bankrupt within five years of retirement from the league. This is a league with average compensation \$5 million per year.

I am interested in applying my Sustainable Wealth (SW) idea to the case of the professional athlete. The key idea of the SW plan is the spending rule that says you can spend each year 3% of total wealth which includes the discounted value of future earnings ("human capital"). For professional athletes, this human capital is quite large. Consider the NBA player with a five- year contract paying \$10 million per year. After tax, this is about \$6 million per year and the present value is just a bit less than \$30 million. The base SW consumption rule is to spend 3% of \$30 million or \$900,000 per year. This is based on the assumption that a reasonably conservative investment strategy can earn a 3% real after-tax return, on average. The idea of the SW plan is that, regardless of age, the athlete can comfortably spend this amount (adjusted upward for inflation) for the rest of his life.

\$900,000 is certainly a lot of money to spend each year, but from one point of view it is extremely conservative. If you make \$6 million after-tax and spend just \$900K, you have a savings rate of 85% (savings is after-tax income less consumption, and the savings rate is savings divided by income, or  $\$5.1\text{M}/\$6.0\text{M}$ ). Few self-respecting financial planners would tell a client to save 85%, and if they did what client would accept that advice? Suppose a very conservative advisor recommended spending just 50% of after-tax income, or \$3.0M. That seems doable, right?

Answer: wrong. \$3.0 million represents 10% of total wealth and will dissipate wealth in just a few years. This suggests the essence of the dilemma for the professional athlete, or any other of the top 1% income earners who only earn that high income for few years. If you are going to provide for 60 or 70 years of consumption with only a few years of earnings, you have to save a very high percentage of that income.

Another interesting feature of very long horizons is that the probability of plan failure increases with the length of the horizon. This is because the volatility in ending wealth

risks over time. So, even though you are spending a fraction of initial wealth that equals your expected annual rate of return, over a 70-year period there is a non-negligible chance of plan failure. Even the 85% savings rate is not high enough to ensure success!

If the athlete were my client, I think I would recommend a variant on the SW plan, namely the 1% Ratchet Rule. This rule says that you can spend each year 1% of the maximum value of your portfolio. That is, each time your portfolio value increases you ratchet up your spending, but you do not lower spending when the portfolio value falls. Coupled with a conservative investment strategy, the 1% Ratchet Rule practically ensures that the athlete never runs out of money. Additionally, there will be a pretty good chance that the athlete's wealth will rise over time to the point that he can buy the team and become the owner. But, the guy would have to constrain first year spending to \$300,000 and endure the ignominy of having a 95% savings rate (\$5.7M/\$6.0M).

While this plan is simple in concept, it is not easy to implement. The famous athlete is almost surely under great pressures by friends, family and associates to spend lavishly and engage in dubious investment schemes. The huge bankruptcy rate for former athletes is likely to persist due to the difficulty of combating these pressures.

## 7.2 YOU ARE NOT YALE

Yale University boasts one of the most successful endowment funds in the country, and maybe the world. The Yale fund ("the fund") has outperformed 99% of like funds for the past two decades. The manager of the fund, David Swensen, is a superstar in the investment management industry. I recently perused the 2013 Yale Endowment Fund Report and noticed several interesting points.

First, thanks to large contributions and exceptional investment performance, the scale of the fund is huge. Total assets at year-end were a bit greater than \$20 billion, and the contribution in 2013 to Yale's operating budget was \$1.1 billion (or about four times combined tuition and room and board). The long-term objective of the fund is to earn a real (after inflation) return exceeding five percent per year. This would enable the fund to contribute five percent of assets per year (the actual spending formula is a bit more complex than this) and still grow in real terms (even before receiving additional gifts).

Second, the investment strategy is unconventional, or at least it was until other endowment funds began attempting to emulate Yale. Based on the twin premises a) you must take on equity-like risk to earn positive risk premiums and b) it is very difficult to

outperform the market in highly liquid markets, Swensen has led the fund to emphasize non-traditional asset classes including private equity, absolute return, and natural resources over the more traditional equity, fixed income and real estate allocations. For example, the target allocation to US equities is 6% and the target allocation to private equity is 31%.

Yale's objective is to perform in the top quartile of each asset class. To accomplish this, the fund employs a staff of very sophisticated, and highly paid, investment analysts to review and select investment managers to run portfolios. The assumption is that it is possible to identify top management talent in most every asset class, particularly the less liquid asset classes. Only the fixed income portion of the fund (target allocation 5%) is managed in-house.

At first blush, the Yale strategy seems to contradict some of the assertions I have made in the past. For example, for most individuals I favor the passive investment strategy promulgated by Vanguard founder John Bogle: buy low cost broad based index funds. Second, I have argued that annual spending 3% of your wealth is reasonable but not really conservative. Spending 1% each year is conservative. How is it that the Yale fund can target spending more than 5%?

What is going on? Well, you are not Yale. For one thing, endowment funds pay very little or no taxes. It is much easier to earn a 5% return pre-tax than after-tax. Second, the scale of the Yale fund is such that they can retain very highly paid investment professionals. This gives them a much better chance of identifying and negotiating with managers that are able to outperform the overall market. Finally, it is highly likely that Yale will receive large future gifts from successful alumni. The analogous thing for an individual would be receiving a large inheritance or winning the lottery. Do you want to count on that?

Evidence in favor of the benefits of large scale comes from the wide ranging magnum opus "Capital for the 21st Century" written by French economist Thomas Piketty. Piketty's general argument, which I will address in future blogs, is that the natural dynamics of capitalism result in growing wealth inequality over time. One part of the argument is that larger portfolios earn higher rates of return due to economies of scale in investment management.

Piketty's primary evidence in support of scale economies in asset management is, you guessed it, University endowment fund returns. He reports that the top funds, including Yale, Harvard and Princeton, each have more than \$20 billion in assets and have achieved 10% average annual returns over the period 1990-2010. Meanwhile, medium-

sized funds (assets between \$500 million and \$1 billion) have earned 8% over the same period, and small funds (less than \$100 million) have earned just 6% on average. Piketty points out that Harvard's internal cost to manage their fund is negligible in terms of return, just 0.3% of assets. But on Harvard's \$30 billion fund, this is \$100 million. Obviously, smaller funds cannot match this level of expenditure.

The argument that scale contributes to return in a positive way is interesting, but to me not convincing. A counter-argument is that superior managers have greater opportunity to outperform when assets under management are smaller, simply because there is a greater array of potential investments that could have a meaningful impact on overall returns. Many of the great investors have performed much better when they had small portfolios to run instead of large ones. For example, the returns on Warren Buffett's partnerships in the 1950s and 1960s are much greater than the returns on Berkshire Hathaway in the 1990s or 2000s. This is because Warren was able early in his career to discover small illiquid securities that were highly under-valued. Such opportunities, even if he could find them today, would not be material to the giant Berkshire Hathaway portfolio. Evidently, Harvard and Yale have figured a way to offset this problem, but it would be a mistake to assume that bigger size generally means higher return.

The Yale Endowment Fund is a terrific case study; one that I am embedding into my classes on investment management and financial economics. But it is not feasible for the vast majority of individuals to attempt to replicate the strategy. In particular, don't count on achieving a 5% return on investment, after adjusting for inflation and taxes.

## 7.3 MR. MONEY MUSTACHE

I have suggested that people would be better off if they massively increased their savings rates. The aggregate Personal Savings Rate (PSR) is defined as the difference between disposable (after-tax) income and consumption spending divided by disposable income. It is reported each month by the Department of Commerce and has recently been running around 4%, compared to a 50-year range of 2% to 15%. My proposed savings rate is derived from my recommended spending rule, which is to spend each year 3% of your total wealth, including both financial wealth (the value of all assets less the amount of debt) plus the present value of future net earnings. For example, consider the median income family with head of household aged 40 and income of \$50,000 per year. This family has a present value of future income of around \$1,000,000 and therefore can spend about \$30,000 per year according to my spending rule. The

implication of this consumption rule for the measured savings rate is quite variable across families, but in the aggregate amounts to about 30%, or more than seven times the current observed savings rate.

The rationale for my proposal is that spending 3% of your wealth each year is consistent with maintaining the value of wealth over time (that why it is called the Sustainable Wealth plan). The advantages of this are both macro and micro. From a macro perspective, the proposal would mean greater growth in the overall capital stock, productivity and real wages. From an individual perspective, people would build and retain valuable options as they get older; options to retire early, to support family education, business or charitable activities, or to spend more. My proposal flies in the face of much conventional thinking in economics and financial planning.

One criticism is simply one of feasibility. How can people increase their savings seven-fold? Of course, some people cannot. If you are living at or near subsistence then you can't lower consumption very much. In order to build up your savings, you need to focus on building income.

However, most of us are way past subsistence levels of spending. There is a very interesting blog called "Mr. Money Mustache" (MMM) that is written by a fellow who decided that his primary goal was to build up a sufficient investment portfolio that would enable him and his wife to drop out of the work force and focus on enjoying themselves and raising their young son. After appropriate study, they determined that investment income of \$25,000 a year would provide for their needs. Then, estimating the future rate of return on a broad equity index fund to be about 4%, they calculated that they needed a portfolio of  $\$25,000 / .04 = \$625,000$  in order to retire. Both husband and wife were software engineers enjoying pretty high incomes, approximately \$100,000 after tax. If you combine a 75% savings rate (savings of \$100K-\$25K, divided by \$100K) and a 4% real investment return you will achieve your required retirement portfolio in just seven years. They ended up accelerating this process by earning better than 4%. In just a few years they had achieved their portfolio objective and retired. MMM and his wife were quite young when they put their plan into action, and they were able to retire in their early 30s. This opportunity is available to anyone, so long as you can save 75% of income and earn a decent return on investments. If your savings rate is lower it will take longer.

I see two messages in this story.

First, the level of spending that MMM determined to be fully satisfactory for he and his family is surprisingly low. Most families spend a lot more than this. Based on this one

example, many if not most families have the ability to dramatically increase their savings rates.

Second, even though we come up with similar recommendations (save a lot more than you are currently doing, and don't dissipate your wealth in retirement) MMM approaches the problem of optimal financial planning quite differently from me. Instead of starting with his projected lifetime earnings stream and attempting to preserve that value, MMM starts with a desired consumption level and uses that to determine the earliest possible retirement date. Both of us target sustaining your wealth in retirement, instead of allowing it to dissipate. MMM's approach is to cut short the value of future earnings as soon as a satisfactory level of financial capital is achieved.

## **FRAGILITY**

Many financial planning proposals are fragile in the sense that they depend on a long list of assumptions including investment returns, rates of inflation and non-occurrence of various debacles like major illness or job loss or collapse of financial counterparties (like, for example, companies that sell annuities). In general, any plan that seeks to maximize lifetime consumption is likely to be fragile, unless it is built on extremely conservative assumptions.

The MMM plan is pretty good on this score, largely because expense levels are low relative to earnings ability. Should MMM suffer a calamitous stock market decline or medical emergency that causes a major disruption in the amount of financial capital, he and his wife could presumably return to the workplace and build back up their portfolio in just a few years to a level satisfactory to handle their consumption needs.

The plan would be even more robust if the spending rate were lower. Instead of spending 4% of wealth each year, if MMM were to spend just 3% (or better yet 2% or 1%) of their wealth each year, then the exposure to a market collapse is much lower. But then again, this would require a larger portfolio and would take more time to accumulate.

My Sustainable Wealth plan is robust as well. The basic idea of the plan is to maintain your wealth indefinitely by keeping spending at or below investment income. Once you are on the plan, subsequent negative shocks to wealth (for example, market downturns) do not necessarily trigger decreases in consumption. The idea is to maintain a stable consumption path. According to the plan, you only "retrench" your spending when the value of a fixed annuity based on current wealth and a conservative estimate of mortality drops below last year's spending level. In general, it will require a sizable drop in wealth to trigger a spending retrenchment. And even should that occur, you can look for



guidance and wisdom in spending retrenchment from Mr. Money Mustache. Like him, you might find that this is a blessing in disguise.

## 7.4 MR. BIDEN AND THE SHED

In order to better understand the state of household finances, the Federal Reserve has recently conducted a special survey called the Survey of Household Economics and Decision making, or SHED. This is in addition to the tri-annual Survey of Consumer Finances. Key findings from the SHED include the following: (a) most families indicate that they are “doing okay” or “living comfortably,” (b) still, about one in three families felt they were financially worse off than they were five years ago, (c) only about half of the respondents were putting some of their income away in savings, and the median savings rate of the savers was 10% of income, and finally, (d) only about one in four households was actively preparing for retirement. While not worrying about retirement is somewhat understandable for young people, it is eye-opening that less than half of people over the age of 50 are not preparing for retirement.

There are certainly valid reasons for not thinking about, nor preparing for, retirement. One reason is that you really enjoy your work and do not plan to retire. Another is that you have a terrific pension plan at work; one that enables you to maintain your consumption levels indefinitely (for an example, see below). But my guess is that most people do not fall into either of these categories. Instead, most people will be forced to downsize spending (“retrench”) during their retirement years.

Financial advisors are generally supportive of the retrenchment strategy. After all, they say, family expenses tend to peak and then decline once children are out of the house and on their own. In fact, the data do show that older households spend less. But is this because expenses are lower or because resources are constrained? My guess is the latter.

The fundamental problem is that most people do not save enough during their working years. The facts that only half of households have saved at all, and the median savings rate for them is 10%, suggest that 75 percent of households have savings rates below 10%. Of course, some people can get away with no or low savings. For example, consider our Vice President.

## **VP BIDEN**

According to a recent Bloomberg News report, Vice President Joe Biden is proud of the fact that he has no savings account, nor does he own a stock or a bond. Presumably, he is pleased to be able to make these claims inasmuch as it appears to place him clearly in the majority 99% instead of the affluent 1%. But, can this be correct? No savings account? No mutual fund? This seems weird for a man that has had a very long and successful career; not only weird, but also somewhat irresponsible. Once you get to the point that you are making a decent income, it is incumbent upon you for the sake of your family to forego consumption and build up some savings.

Of course, in Joe's situation there is no need to do this. After all, as of 2016 Vice President Biden will have had a forty-plus year career in Congress and eight years as Vice President. For this, he earns a substantial salary and an even more impressive pension (which is adjusted for inflation). Given this salary and pension, he really doesn't need to save (assuming he does not intend to leave a financial legacy for his children). So maybe it is understandable that he has created no savings or investment account. Yet from another perspective this is troubling.

The primary source of capital for new ventures is savings, and their ultimate placement in equity securities or debt securities or mutual funds. The fact the Vice President Biden views it as a positive that he has not saved is unfortunate. It reflects a view from one of the preeminent members of the Democratic Party that building up a savings account is a bad thing. What happened to Benjamin Franklin? This sends a bad message. It is through savings that capital is cumulated. Along with knowledge, accumulation of capital is a primary source of improved productivity and improved standards of living. We want to promote savings, not denigrate it.

## **BOTTOM LINE: DON'T RETRENCH, RATCHET!**

I think people would be better off if they adopted a plan that allowed them to spend more as they age. To accomplish this is easy: just estimate your total economic resources (including future earnings power) and keep annual spending to a modest fraction (1% or 2%) of total resources. For most people, implementation of this plan will mean lowering the amount of current consumption. But the good news is that, barring disastrous investment performance, the implication of this strategy is that your wealth will rise over time and so will your spending. Not only that, but the economy's overall performance will be better as well.

# CHAPTER 8: WHAT TO DO NEXT?

## 8.1 HOW TO REALLY RUIN YOUR FINANCIAL LIFE

Actor, economist, humorist Ben Stein has written an innovative book<sup>1</sup> on financial planning. Instead of telling you what you should do to improve your financial position, Ben tells you 49 things you can do to impair your financial position – to reduce wealth, reduce income, and increase the chance of destitution. Many of these things he admits to having done himself. Leading the list of mistakes is frequent trading, followed by active stock picking, investing in hedge funds, timing the market, and buying commodities.

While most of the book is devoted to mistakes you can make in investments, Mr. Stein devotes several pages at the end of the book to pointing out numerous ways you can dissipate your human capital, like flirting at the office, drinking at lunch, undercutting your boss, showing up late for work and growling at customers and coworkers. How serious are these various mistakes? Perhaps we can order them by degree of damage done, or by wealth foregone, and by doing so find the optimal path to total financial destruction.

It looks to me like Mr. Stein missed the most fundamental financial mistake at all, which is to forego saving for the future. Careful allegiance to that strategy will result in 100% loss of potential wealth. It is hard to lose more than that.

After that, the most significant mistake is to invest in such a way as to dramatically reduce your potential return. Mr. Stein mentions many ways to accomplish this by increasing transactions costs, paying high fees, making poor timing decisions and opening yourself up to investment scams. By carefully following his advice the average investor should be able to give up the vast majority of potential investment gains (assuming these weren't already foregone through mistake number one in the prior paragraph).

For most young people, the value of their human capital is substantially greater than the value of their financial capital or net worth. By identifying 29 separate ways to gnaw away at the value of your human capital, Mr. Stein has provided a path to wealth destruction here as well.

While Mr. Stein's book is intended to be humorous, there is a serious side. Perhaps readers will be able to see themselves in some of the examples. By poking fun at various beliefs, foibles and mistakes in a non-threatening way, Mr. Stein may inadvertently increase the financial IQ of his readers.

## 8.2 GAMMA (#45)

Morningstar has published a research report that purports to show that a properly constructed financial plan can generate a meaningful increase in lifetime retirement spending. The value added from a plan is referred to as "gamma" following in the line of Greek letters being used to assess investment returns. The first Greek letter "alpha" is the extra-market return offered by active investment managers, and the second Greek letter "beta" is commonly used to refer to exposure to overall market risk and return. The value added ("gamma") from a well-devised financial plan is estimated to be 29%. That is, retirement income is expected to increase by 29%. Translated into an annualized benefit, the value of the plan is 182 basis points per year, according to the authors' calculation<sup>1</sup>.

The sources of additional value due to financial planning include a) taking into account the effects of human capital in establishing the asset allocation (which generally means a higher equity allocation when young), b) considering the use of life annuities to hedge longevity risk, c) substituting a dynamic portfolio withdrawal strategy, d) tax efficient portfolio allocations, and e) a liabilities driven process.

The Morningstar methodology is to simulate the outcome of a smart strategy and evaluate its performance against a base case consisting of a fixed equity allocation of 20% and a 4% portfolio withdrawal rule in retirement. The authors compare the income generated by their financial planning strategy as compared with that generated by the fixed rule.

### ASSET ALLOCATION FOR DUMMIES

John Bogle, former CEO of Vanguard, has similarly reported<sup>2</sup> on the potential for improved financial performance. His approach is a little different in that he compares actual investment returns earned by retail investors with the market returns that were available to them through passively managed index funds (of which Vanguard is a major provider). Bogle has documented hundreds of basis points of return shortfall due to the

combined effects of large fees, transactions costs, excessive trading and poor investment timing.

Bogle's comparison is actual performance of retail investors as compared to index fund performance. It is possible that the Morningstar and Bogle performance gains may be additive. That is, the financial planning strategy may be able to add value on top of passive investment in index funds. If so, there is the potential for many hundred's of basis points combined value added.

Is this reasonable, or has Morningstar, and Bogle as well, simply identified value added as compared to a straw man of their own creation?

Financial experts do not always agree on the best strategies. For example, some advisors promote passive strategies utilizing index funds while others prefer active management. Still, the old saying that the best is the enemy of the good may apply here. Even without identifying the very best solution, it may be that Bogle and Morningstar are correct in their assertion that the strategies deployed by many if not most people today are clearly sub-optimal. In that case, there is a great opportunity to improve financial performance without necessarily resolving all disputes among the experts.

But there are pitfalls. At first glance, added value of 182 basis points per year is surely impressive. But then you have to ask how much of this gain do we need to pay in order to hire the financial planners to implement the strategy? Also, how do we know we have found competent advisors?

In order to realize this opportunity, Mom and Pop have to improve their financial decision making. While probably not feasible for everyone, the best solution is to become sufficiently knowledgeable about these issues that you can create your own plan, or be confident that you can hire the right people to help you do so.

## **CONCLUSIONS**

The bottom line is that there appears to be a significant opportunity for individuals to improve their financial performance. But, this opportunity can easily be wiped out by excessive fees or mistakes. You need to find trusted advisors who add value in excess of their fees. But it is very hard to discern this in advance. The best way out of this box is for people to become more financially literate.

## REFERENCES

- 1 Ben Stein, How to Really Ruin your Financial Life and Portfolio, Wiley, 2012.
- 2 David Blanchett and Paul Kaplan, "Alpha, Beta and Now ... Gamma", Morningstar, 2012.
- 3 John Bogle, The Little Book of Common Sense Investing, Wiley, 2007.

# APPENDIX

Please go to [www.clucrf.org/financial-markets](http://www.clucrf.org/financial-markets) to find our sustainable spending tool (that we call 'FINSIM'). FINSIM is a financial calculator that provides an assessment of the sustainability of your financial plan, and provides an easy mechanism to adjust the plan if the sustainability is low. The tool is very simple and easy to use. You simply input your age, expected retirement age, current after-tax income, financial net worth and estimated income in retirement aside from Social Security or investment income. You also input your desired level of real (inflation adjusted) annual consumption, your desired bequest amount, if any, and your desired asset allocation (percentage of portfolio assets invested in equities).

FINSIM immediately provides estimates of the amount of total wealth (including financial wealth and the present value of future income), the probability of plan failure (defined as running out of money in retirement) and the probability of achieving your bequest goal. If the probability of plan failure is too high, the user can experiment with various “dials” including target consumption, retirement age, and asset allocation in order to reduce the failure probability.