



Economics-Based Personal Finance

A Core Book
Fall 2021 Edition

Robert Puelz and Aaron Stevens

©FINPLAN, LLC
Economics-Based Personal Finance Edition
ISBN 978-1-7372909-0-2

Preface

Introduction

What is personal finance? The answer to the question is difficult for individuals and families because websites, books, and advisor guidance are normally numbered with “one-off” answers to questions detached from a core body of knowledge. “Whether to save,” “how to invest,” “how to structure a trust agreement,” etc., are very important personal finance questions, but how these types of questions fit within a greater context is more important. Without a foundation, there cannot be a durable structure.

In this book, we rely on economists, including six Nobel Laureates, who have spent close to a century developing the life-cycle model of saving and consumption. The life-cycle model provides a framework for making more effective real-life financial decisions and recognizing and valuing the financial aspects of seemingly non-financial decisions. The shorthand for this framework is “life-cycle consumption smoothing” where smoothing refers to the need to spread economic resources over a lifetime, considering that individuals have highly uncertain futures. The learning offered in this book is practical and is based on standard microeconomic theory of household behavior extended to decision-making that occurs over time as well as across times – both good times and bad times.

This book offers a single source solution for any individual or household including college students who wish to become financially literate. Our experience is the content is perfect for a standalone class in personal finance, and it would be the initial, core course in a multi-dimensional financial planning curriculum. Moreover, this book supports the best financial planning software package on the market today, MaxiFi, which has been built to answer financial questions and household financial plans using the life-cycle model as its basis. Whether a student or financial planner, we hope that our applied format is approachable and informative to sound personal economic decision-making.

Scope of this Text

Every choice one makes about education, career, living location, housing type, family, and investments entails economic benefits and costs. A decision one makes today about education or

employment alters one's life path, and therefore one's lifetime standard of living. Universities are populated with scholars and students who focus on problems of corporations, non-profits and smaller businesses by applying tools from accounting, marketing and finance. Yet, both scholars and students remain mostly unprepared for personal financial decisions about their personal economy. We aspire to change that by equipping those same scholars and their students with a paradigm for personal finance worthy of higher education. Our intent is to offer a text which relies on a knowledge backbone so that a solution to a more specific question, e.g., "If I save money should I use a Roth IRA or my employers 401(k)?" is found consistent with how all other personal finance decisions are made. Internal consistency in personal finance decision-making is critical for the best financial outcome.

By contrast, most personal financial advice - whether from trade books, textbooks, television talk show pundits, or professional personal financial advisors - is scattershot and not linked to the body of economic science. Inaccurate financial advice may be driven by self-interests, but other times the financial patient is seeking a diagnosis to a specific illness and the prescription is appropriately narrow. Our approach is to join the series of personal finance problems, peel away the conflicts of interest, and offer a holistic solution to financial well-being that has the best chance of optimizing the happiness rendered from one's financial prospects.

Economics-Based Personal Finance begins with an introduction to the basic life-cycle model and why the life-cycle model should be *the model* used in a financial literacy course, advisory wealth management and financial planning. We link the basic life-cycle model to the more elegant and advanced life-cycle model software, MaxiFi, and analyze a number of key financial planning questions. The fundamental set of tools offered in the book are integrated with institutional details about the economic value of the individual, how education can affect the value, the role and repayment of student loans, and the economics of where to live. The text is rounded out with chapters on investments, 401(k) plans, Roth IRAs and the "when to retire" question. Knowledge is assembled to support the premise that an optimal and sustainable living standard ought to be the objective of any personal, financial planning question.

Content Organization

We have given the book a sequential structure that follows our experience in the classroom that complements student learning. The book is driven by our success in using case studies to help students learn the fundamentals of sound personal financial decision-making. Fundamentals captured in the first two chapters set-up a more flexible approach among the remaining chapters tailored for instructional needs and the length of the term of instruction.

Chapter 1: Overview of the Economic Life-Cycle and Financial Health introduces the terminology and metrics to describe the financial health of a household. How to evaluate financial health is illustrated with two examples of the financial fitness of neighboring families where the concepts of human capital, economic net worth and risk exposure are introduced. The chapter closes with a four part breakdown of the value of a scientific approach to personal finance after a warning about ubiquitous financial rules of thumb that can inhibit an individual or household's ability to achieve economic happiness.

Chapter 2: The Life-Cycle Model develops the life-cycle model as the way to maximize economic happiness over time. The chapter has been designed to explain the life-cycle model through the building of a prototype plan in a spreadsheet. How to optimally spend and budget and the utility of consumption smoothing are explained. In turn, income, consumption, and savings are woven into

the development of a long-term financial plan while considering the topics of charitable giving and the receipt of an inheritance.

Chapter 3: *Making the Life-Cycle Model Real* introduces MaxiFi Planner by application to numerous case studies. MaxiFi is a comprehensive software package that implements real-world life-cycle personal financial planning while including investment returns and risk, retirement plans, taxes, and social security benefits. After an introductory case study for a single individual, case studies that consider household couples, households with children and households that value setting aside an account for emergencies are developed.

Chapter 4: *Four Key Life Decisions* uses the life-cycle model as a paradigm to analyze four important real-world decisions for college students and new college graduates. How to best achieve the highest standard of living is the measure to evaluate a) human capital and job choice, b) the economic value of additional education, c) the geographic choice of where to live, and d) how to best payoff student loans. Each topic is explored with a case study.

Chapter 5: *Investments* discusses the trade-offs between investment risk and investment return. The chapter begins with the importance of a brokerage account and other investment accounts for other needs such as an IRA and a 529 educational savings account. The chapter provides an overview of historical returns from financial asset investments and how inflation changes real returns and purchasing power. Individual stocks are discussed at length including the many bad ideas about investing in stocks which have become commonplace. Then the focus of the chapter turns to the value of diversification and its implementation through the use of mutual funds and exchange-traded funds (ETFs).

Chapter 6: *Investing in Stocks and Living Standard* takes the individual who wants to invest through a systematic process to build a portfolio with the best chance of obtaining an appropriate actual return for the level of risk taken. We present asset allocation and tie-in an investor risk-profile to an investment choice. Then annual portfolio rebalancing is introduced to help an investor stay on their right path. The numerical technique of Monte Carlo simulation is used to estimate the chance that investing in stocks will make you worse off in retirement, compared to investing in risk-free assets. Finally, the chapter ends with a case on living standard risk that discusses how a household should allocate their investments to manage their living standard risk.

Chapter 7: *Risk, Risk Management and Insurance* offers the basis for insurance markets and prices then looks at life insurance, renter's insurance and automobile insurance. Because many types of personal risks are required by law or contract to be handled by insurance, we present ways to shop the insurance market to give the buyer the best chance to have a great insurance experience at the least possible cost.

Chapter 8: *Planning for Retirement* puts retirement planning choices into a life-cycle framework. Individual retirement accounts (IRAs), Roth IRAs, 401(k)s and other qualified plans are put into an "best living standard" context. Case studies built on the question "when to retire," explore both the effects on households retiring late versus early, and the choice about when to file for Social Security retirement benefits; a topic of importance to older, near retirement individuals.

Acknowledgments (Robert Puelz)

A number of years ago, my students have benefited from Aaron Stevens' original work and I am delighted that we are now collaborating on a second book. Larry Kotlikoff has been very encouraging for we realize that financial planning and wealth management can benefit from a theoretical foundation which does not underpin current financial planning practice. My thanks to

Jeanne Milazzo at the Cox School of Business at SMU for her assistance in helping getting the first book to publication in 2018, and to my SMU students who have gone beyond learning the life-cycle model to commenting and correcting earlier versions of the first book. Finally, my love to ACD. You are my life.

Acknowledgments (Aaron Stevens)

Many friends, colleagues, students, and family members contributed their time to reading, editing, or just providing ideas for this text. Among my colleagues I am fortunate to include Professors Zvi Bodie and Laurence Kotlikoff, who provided countless ideas and subject matter expertise as we developed the EC171 class at Boston University in 2010. My past department chairs in the Department of Computer Science at Boston University have been extremely supportive of my efforts in teaching EC171 and MA120 and writing this book. And I wish to thank Professor John Magee of Clark University, the Reverend Dr. Bert White, and Robert Puelz, of Southern Methodist University for their many discussions and ideas over the years.

To the extent that this book is any good, it is due to the efforts of many of my students (over the course of several years) who have read, reviewed, corrected, copy-edited and commented at many phases of its development. While I can honestly claim that the content of the book stands on the shoulders of giants, the efforts of my students have really helped shape this book.

My father Michael Stevens read multiple drafts and provided helpful comments and constant encouragement. Despite concerted efforts to contrary, my wife Jennifer has read and discussed a great deal about personal finance over the years. She provided encouragement and support through the writing phase, and she does not give herself credit for how much she knows!



Table of Contents

1	Introduction	12
1.1	Introduction to Life-Cycle Economics	12
1.2	Money, Income, Consumption, and Saving	17
1.3	Assets and Liabilities	19
1.4	Evaluating Financial Health	21
1.5	Economic Net Worth	23
1.6	Risk Exposure	28
1.7	Financial Advice	29
1.8	The Scientific Approach to Your Economic Life	30
1.9	Summary	31
1.10	Review Questions	33
1.11	Problems	33
2	The Life-Cycle Model	38
2.1	Introduction: The Life-Cycle Model	38
2.2	Economic Happiness and Uncle Elwyn	39
2.3	Consumption Smoothing and Roxanne	44
2.3.1	Incorporating Initial Assets and Bequests	47
2.3.2	An 80-Period Life-Cycle Model with Uneven Wages	48
2.3.3	Case Study: Borrowing against Uncle Elwyn's Inheritance	49

2.4	Borrowing Constraints More Generally	51
2.5	Summary	54
2.6	Review Questions	55
2.7	Problems	55
2.8	Appendix	57
2.8.1	Consumption Smoothing and The Two-Period Life-Cycle Model	58
3	Making the Life-Cycle Model Real	63
3.1	Introduction	63
3.2	MaxiFi Planner	64
3.2.1	Beware of False Precision	66
3.3	Introductory MaxiFi Planner Case Studies	66
3.3.1	Case Study: Steve Who is Young and Single	67
3.3.2	MaxiFi Planner: The Input Screens	67
3.3.3	MaxiFi Planner Reports	79
3.3.4	Case Study: Married Couple with Children	83
3.3.5	Case Study: A Household and a Reserve Fund Target	89
3.4	Summary	92
3.5	Review Questions	92
3.6	Case Studies to Try on Your Own	92
3.6.1	Case 1 - Single person	93
3.6.2	Case 2 - Two-person household	95
3.6.3	Case 3 - Household with children	97
3.6.4	Case 4 - The effect of a reserve fund target on living standard	100
3.6.5	Case 5 - Single person with a trust who lives modestly	102
4	Four Key Life Decisions	105
4.1	Introduction	105
4.2	Your Human Capital	106
4.2.1	Human Capital is a Wasting Asset	106
4.2.2	Human Capital Risk	107
4.3	Investments in Human Capital	108
4.3.1	A Prelude to Education and Human Capital	109
4.3.2	Economics of Human Capital	110
4.3.3	Case Study: Modeling Differences in Human Capital	113
4.4	Graduate Education	116
4.4.1	Case Study: Modeling Whether More Education is Valuable	117
4.5	Where Should You Live?	121
4.5.1	Case Study: Modeling Geographic Choice: Dallas or Chicago?	122
4.5.2	Dallas or Chicago: Standard of Living Effects	123

4.6	Modeling How to Payoff a Student Loan	125
4.6.1	A Primer on Loans	126
4.6.2	Case Study: The Choices of Repayment of Student Loan Debt	130
4.6.3	Loan Repayment: Standard of Living Effects	131
4.7	Summary	132
4.8	Review Questions	134
4.9	Case Studies to Try on Your Own	134
4.9.1	Case 1 - Kate and Jamie: Different Human Capitals	134
4.9.2	Case 2 - The Value of Graduate School to Preston Zimmer	138
4.9.3	Case 3 - Trevor Stoneman's Geographic Choice	140
4.9.4	Case 4 - Isabella Tringali's Student Loan Payoff Choice	142
5	Investments	144
5.1	Introduction: Investments in Financial Securities	144
5.1.1	Setting up an Account	145
5.1.2	Account Types and Service	147
5.2	Risk and Return	147
5.2.1	Historical Returns	149
5.3	"Real" Investment Performance: Inflation and Purchasing Power	151
5.3.1	Inflation and Purchasing Power	151
5.4	Inflation Indexed Bonds	154
5.4.1	Series I Savings Bonds	155
5.4.2	Treasury Inflation Protected Securities	155
5.4.3	An Example: TIPS v. CD	156
5.5	The Mechanics of Stock Market Investments	157
5.5.1	Making and Losing Money in Stocks	159
5.5.2	Investing Strategies	161
5.5.3	Unreliable Ideas about Investing in Stocks	163
5.5.4	The Good News about Investing in Stocks	165
5.5.5	Efficient Markets and The Random Walk	166
5.5.6	Wealth Diversification: Rely on this Idea when Investing in Financial Assets	168
5.6	Diversification Made Easy: Mutual Funds and Exchange-Traded Funds	169
5.6.1	Financial Asset Diversification	170
5.6.2	Mutual Funds and ETFs	171
5.6.3	Buying and Selling Mutual Funds	173
5.6.4	Should You Pay for Professionals?	174
5.6.5	How are ETFs Different?	176
5.7	A Quick Methodology for Individual Stock Selection	177
5.7.1	Investment Research	179
5.7.2	A Basic Approach	179

5.8	Summary	184
5.9	Review Questions	185
5.10	Problems	185
6	Investing in Stocks and Living Standard Risk	187
6.1	Conventional Wisdom: Stocks are not Risky in the Long Run	187
6.2	Monte Carlo Simulation	188
6.2.1	Implementation of the Monte Carlo Process	189
6.2.2	Using Confidence Intervals to Estimate Future Stock Market Investment Value	194
6.3	Asset Allocation	197
6.3.1	Risk Profile: Completing an Asset Allocation Choice	199
6.3.2	Rebalancing	201
6.4	Living Standard Risk	202
6.4.1	Case Study: The Distribution of Living Standards for the Peterson Household	204
6.4.2	The Peterson's Current Financial Condition	204
6.4.3	Playing "What-if" for the Peterson Household	207
6.4.4	The Range of Living Standards: "What If" Results and How to Decide	209
6.5	Summary	213
6.6	Review Questions	214
6.7	Cases to Try on Your Own	214
6.7.1	Maggie Goodkind's Retirement and Living Standard Risk	214
6.7.2	Maggie Goodkind's Risk Analysis	218
7	Risk, Risk Management and Insurance	219
7.1	Introduction	219
7.2	What is Risk?	220
7.3	The Risk Management Process	221
7.4	Case Study: The Risks Affecting a Recent College Graduate	222
7.5	Risk Management Techniques	223
7.6	Protecting Your Human Capital	228
7.6.1	How Much Life Insurance Do You Need?	229
7.6.2	Life Insurance Product Solutions	234
7.6.3	Disability Could Impact Your Human Capital	236
7.7	Protecting Your Assets	238
7.7.1	Renter's Insurance	239
7.7.2	DICE	241
7.7.3	Automobile Insurance	243

7.8	Your Emergency Fund	245
7.9	Summary	247
7.10	Review Questions	248
7.11	Cases to Try on Your Own	248
7.11.1	Case 1 - Singles and Married Couples: How much life insurance?	249
7.11.2	Case 2 - The Read Family: How much life insurance?	251
8	Planning for Retirement	254
8.1	Introduction	254
8.2	Longevity	255
8.2.1	Solutions to the Financial Consequences of Longevity	256
8.3	Defined Benefit Pension Plans	257
8.4	Defined Contribution Retirement Plans	259
8.4.1	Types of Defined Contribution Plans	260
8.4.2	Special Tax Treatment for DC Plans	261
8.5	Participation in 401(k) plans	262
8.5.1	Case Study: Should Steinbeck Blue save through his employer's 401(k) plan? .	263
8.5.2	Should Steinbeck Blue save with a 401(k)?	265
8.5.3	Should Steinbeck Blue use a Roth IRA instead?	267
8.5.4	Employer Matching Contributions	272
8.5.5	What About Higher Tax Rates in the Future?	273
8.6	When to Retire?	274
8.6.1	Case Study: When to Retire?	275
8.6.2	Retiring at Age 62 v. Age 67	276
8.6.3	Retiring at Age 62 and Deferring	277
8.7	Summary	278
8.8	Review Questions	279
8.9	Cases to Try on Your Own	279
8.9.1	Case 1 - Garnett Upshaw's IRA choice	279
8.9.2	Case 2 - Old Uncle Tom and the Decision to Retire	281
	Bibliography	285