ENGINEERING YOUR RETIREMENT

Retirement Planning for Technology Professionals

Mike Golio

IEEE PRESS

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CONTENTS

PREFACE

Retirement means different things to different people and the unique circumstances of each person means that general advice is sometimes difficult to provide. There is one bit of advice, however, that applies to everyone: If you have not yet begun to plan for your retirement, the best time to start is right now.

I first got serious about retirement planning about 10 or 12 years ago. My wife, JJ, and I were fortunate to be electrical engineers earning healthy salaries. We were also conservative spenders so we were saving money. We both had plenty of diverse interests outside of engineering so we were not confused about what to do if we were not required to go into the office. Despite these advantages, we really had no specific plan for how and when to retire.

Prior to this point, financial matters and investing had never interested me. I much preferred a lively discussion about electron transport in semiconductors to one about the real rate of return on government I bonds. Taxes were a nightmare ordeal I had to live through each April. Tax strategies that would need to be applied over three or four decades never crossed my mind. Health insurance was something that came with the job. I had no idea what it would cost to replace it. Wills, powers of attorney and other legal documents were alien to me. When I first began to consider retirement, I had no idea where to go for the kind of quantitative, analytical information my engineering outlook on life demanded. The vast majority of the finance and retirement literature available was not very satisfying. It contained a shortage of data, mathematics, and logical development. Most of the literature seemed to be thinly veiled advertisements. Questions about how much I might need to save, what kind of investments to make, and how long it would take all seemed out of reach.

Eventually I did find good sources of information as well as useful simulation and analysis tools. As with most research projects, discovery of one good source led

to another, and another, until I was overwhelmed with substantive material. I discovered literature that was logical, mathematically rigorous, and useful. A combination of sources, including academic financial literature, government reports, independent internet sites, and financial articles from savvy columnists, provided good, quantifiable advice on retirement issues. I poured myself into this literature, and soon realized that all my retirement questions could be bounded and addressed. Retirement could be engineered like a new buffer amplifier or a suspension bridge. In fact, it required that kind of attention.

This book is an outgrowth of my research as well as countless discussions with other technical professional retirees. I have addressed the topics I was concerned about as well as those of highest priority to my friends and colleagues. The text examines primary issues related to each topic and then points to more detailed references. The complementary website, *www.golio.net,* provides supplemental data, tools, spreadsheets, and analysis organized according to the table of contents of the book.

I think you will find this book useful as you engineer your own retirement, and I hope the retirement plan you design is satisfying and enjoyable. Good luck.

ACKNOWLEDGMENTS

My wife, JJ, read and redlined the entire manuscript for this book before any other reviewer saw it. She critiqued grammar, content, and organization. JJ also developed the website *www.golio.net* that complements this book with useful URLs organized according to the book outline. While I was writing, she also took up much of the workload on two other editor projects I am responsible for, including *IEEE Microwave Magazine*. It is not an exaggeration to say that this book would not have been possible without her.

Other people have had impact on this project. My parents taught me to live frugally and living below your means is surely the most critical principle in the development of a viable retirement plan. John Greaney (aka intercst) and Bill Sholar (aka dory36) both developed Internet websites of considerable value to those seeking sound advice about retiring. These sites are free, but you definitely get more than you pay for.

Samir El-Ghazaly backed this project as Publications Chair of the IEEE MTT Society. Wayne Shiroma and Bob York provided further Society support. Cathy Faduska, Jeanne Audino, and the publication professionals at Wiley/IEEE Press have done a great job and been wonderful to work with.

I want to sincerely thank all of these people.

1

RETIRE ON YOUR SCHEDULE

As a technical professional living in an industrialized nation today, choices are available to you that many others do not have. Concerning marriage, children, and jobs, you can choose when, where, and what you want to do. In addition, if you plan appropriately, you can decide when and how to retire.

Although Social Security and Medicare benefits have made most Americans think about retirement as something that occurs in their mid-sixties, no natural law dictates this practice. Many people choose to work much longer. Only 58% of Americans over the age of 65, for example, consider themselves completely retired.[1] Others choose to retire much earlier.

Throughout much of history, retirement occurred only when someone became too frail or sick to work. This is still true today in less-developed countries. Improvements in productivity and work environment during the 20th century, however, have led to a mid-sixties retirement norm. Although available data for people retiring in their fifties or younger is difficult to obtain, Figure 1.1 illustrates the trend toward lower mean retirement age in the United States from 1950 to 2000. By 2000, the average age at retirement was less than 62, with many Americans retiring in their fifties or earlier.

Although countless surveys indicate that most Americans are looking forward to retirement, the same studies reveal ignorance about the requirements for successful retirement. This may be due in part to different motivations for retiring. Some people want to pursue other interests but are limited by job constraints. Some people want to escape a work environment they do not enjoy. Others feel like "wage slaves" and long for freedom to do whatever they want. Another part of the problem may have to do with the broad range of lifestyles that people imagine for their ideal retirement. Retirement can involve traveling the globe, simply sitting on the porch

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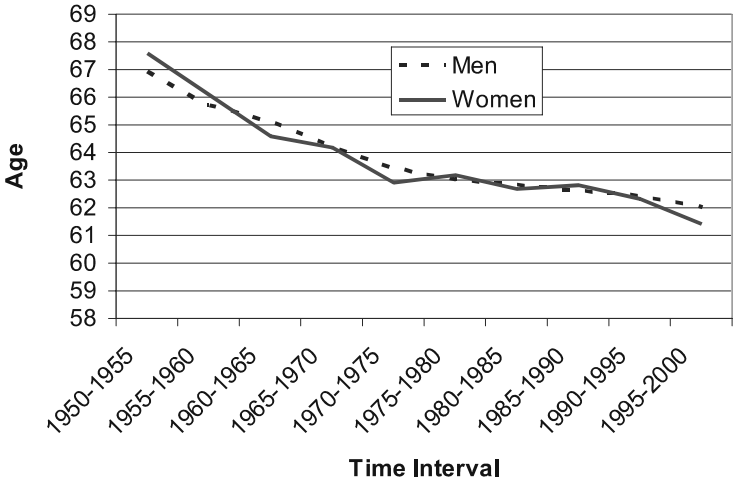

Figure 1.1. Decreasing mean age at retirement in the United States from 1950 to 2000. (Source: Murray Gendell, "Retirement Age Declines again in 1990s," *Monthly Labor Review,* October 2001, pp. 12–21.)

in a rocking chair, finding seclusion, volunteering, or working because you want to, not because you have to.

Regardless of your personal definition and views on retirement, it is a fact that close to 80 million Americans will be either close to retirement or in retirement within the next 20 years. At a time when an unprecedented number of people will reach traditional retirement age, we are also facing funding issues for Social Security and Medicare, witnessing the default of numerous corporate pension plans, and experiencing a personal saving rate of near zero. If aging engineers are to have any chance of enjoying a successful retirement, both financial and social preparation must be completed.

Retirement planning is helpful at any age, but saving early is especially valuable. An early start to saving is the best path to accumulating the resources you will need for a successful retirement. Young technical professionals who begin saving a fraction of their salary at the beginning of their career will be able to retire on their own schedule. Figure 1.2 illustrates the value of starting early.

This figure considers a technical professional with a starting salary of $50,000 per year. An average salary increase of 5.5% per year (3.5% inflation, 2% experience bonus) is assumed. This data is consistent with the IEEE salary survey data for a BSEE graduate with no experience. The salary increase assumptions underestimate the experience of most electrical engineers since they ignore salary increases for promotions into positions of higher responsibility. Similarly, salary increases for obtaining advanced degrees are not considered in the salary increase rates. For example, an individual who obtains an advanced degree after starting work and

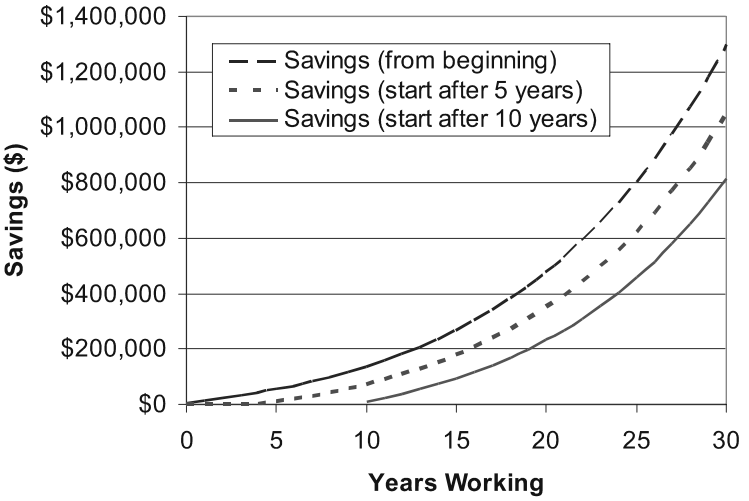

Figure 1.2. An illustration of the value of saving early. The figure represents the savings of an individual with a starting salary of $50,000 per year, an average annual increase in salary of 5.5%, a saving rate of 10% of annual salary, a company match of 3% on 401(k) investments, and assumed earnings on investments of 7%. Three cases are plotted: (a) a person who begins saving as soon as he or she starts working, (b) a person who waits 5 years to begin saving, and (c) a person who waits 10 years to begin saving.

moves into technical management after several years might expect an average salary increase of 8% or higher over the 30-year period illustrated in Figure 1.2.

The hypothetical engineer of Figure 1.2 invests 10% of pretax salary each year and takes advantage of a 3% company 401(k) match. The assumed average return on all investments is 7% over the 30-year period. Three cases are illustrated: (a) a person who begins saving as soon as he or she starts working, (b) a person who waits 5 years to begin saving, and (c) a person who waits 10 years to begin saving.

Even though Figure 1.2 is a simplified case that considers only fixed annual raises, and returns (without variations from year to year) it clearly illustrates the value of starting early. After 30 years, the engineer who starts saving from the first day on the job will have $480,000 more than the colleague who put off saving for 10 years. As in the case of engineering projects, early planning is invaluable.

It is not too late for the slow starter who begins to save in year 10 of his or her career. The time advantage of the early investor can be made up, for example, by increasing the saving rate from 10% to 17.7% once saving starts in year 10. Such a plan reduces disposable income by 7.7% for 20 years, but will result in identical portfolio value in year 30. Achieving a higher rate of return (at least 11.3%) can also compensate for the late start. In the investment world, however, higher returns are always associated with higher risk. Finally, the slow starter could choose to work for 6 years longer to make up the difference in savings.

For the engineer who wants to work beyond normal retirement age, starting to save early may seem of little value. It is worth noting, however, that although 68% of currently working Americans expect to work for pay in some capacity after they retire; only 32% of current retirees actually have worked for pay after retirement.[1] This statistic might indicate that working seems less attractive to the 65+ year old than it did to the 25 year old. It may also be that there are not enough jobs available for 65+ year olds.

1.1. RETIREMENT OPTIONS

Work Until You Drop

Some people feel that work gives them purpose. In a February 1997 article of *The Free Market* titled "I'll Never Retire," William Diehl asserts that "There is a sense of self-worth that comes from working to a purpose that is essential to well-being, whether the task involves major responsibility or physical exertion, as both require diligence and daily attendance." He further sums up his feelings about retirement stating, "As we observe able-bodied citizens hiking the malls or sampling the midnight buffets on the cruise ships, we are struck by their purposelessness, and the overwhelming boredom they manifest. There is no need to arise in the morning, or any necessity to go to bed on time. Their reason for existence has ceased. They have lost the respect of those who support them, and lost their self-respect in the process."

This attitude seems extreme to many, sad and pathetic to others. One might ask if Mr. Diehl believes that working to produce a profit for a company is really a higher calling. If you were granted unlimited possibilities, do you believe the most important thing you could do is work? Is this really more important than focusing on the development of your social and family relationships? On volunteering in your community? On being a better parent? A better spouse? A better person? Nevertheless, if this is how you feel, retirement is not for you. Even if you do not wish to retire, it may be in your best interest to achieve financial independence and to develop some interests beyond the office. Events outside of your control may lead to a time in your life when you are not able to work. A comfortable nest egg (or seed money) might be important. Even if you feel that retirement represents a meaningless existence today, you may change your mind in the future. Preparation today provides opportunity tomorrow.

Normal-Age Retirement (~ Age 65)

On average, men in the United States retire at age 62, whereas women retire at age 61. The Social Security Act of 1935 and the Medicare bill of 1965 have made mid-sixties retirement the norm. In a study by the National Council on Aging, 72% of those surveyed said qualifying for Social Security was their most important reason for retiring. Nearly half of all workers choose to begin taking Social Security benefits at 62, the earliest age they are available.

In the face of continuing economic uncertainty, dwindling company retirement benefits, and escalating medical costs, growing numbers of Americans are pushing back their planned retirement dates. Many aging workers who had expected to ease comfortably out of the labor force in their fifties and early sixties are discovering they do not have the financial resources to support themselves in retirement. Since the mid-1990s, older people have become the fastest-growing portion of the work force. The Labor Department projects that workers over 55 will make up 19.1% of the labor force by 2012, up from 14.3% in 2002.[2]

Get FIREd (Financial Independence, Retire Early)

They had a word for work in ancient Greece: *ponos.* It meant labor, but it also meant suffering. Work was what slaves did. Free men were thinkers—philosophers and appreciators of art.

Many people have to work to live. Not working is not an option so they have become slaves to their jobs and salaries—wage slaves. They may have set high goals for themselves and toiled long and diligently through their careers only to find themselves working for an impersonal company and reporting to someone they do not respect.

To some, the idea of early retirement is appealing—the earlier the better. Early planning and appropriate lifestyle choices can provide financial independence long before a worker reaches his or her sixties. The mantra of early retirees is, "Get FIREd (Financial Independence/Retire Early)."

Job Satisfaction, Retirement, and Financial Independence

Many engineers find their jobs enjoyable and rewarding. Professionals, who find themselves absorbed in their work, may feel it is unnecessary to plan for retirement or develop interests outside of science and technology. Unfortunately, factors outside of their control within the industry, workplace, home, or their own body can quickly change satisfaction to boredom or even dread. Obtaining financial independence can greatly improve job satisfaction and provide insurance against the stress and anxiety associated with many factors outside of your control.

Acceptance of the Workplace. Many people who have worked and saved long enough to retire have found the urgency to do so diminish once they achieve financial independence. That achievement has a way of making office politics or poor management less infuriating. Tolerating an incompetent manager or clueless Human Resources (HR) representative is easy once you have the resources to walk away whenever you want to. Your colleagues' annoying habits may be transformed into minor amusements once you realize that you do not have to face them. Money cannot buy love, but financial security can make life tolerable, even working life.

Workplace Volatility, Industry Downturns, and Management Upheavals. Technical professionals can be performing well in their jobs and still become victims of industrial forces outside of their control. Corporate management can make the decision to refocus resources and eliminate an existing development effort. A large customer can decide to use a different supplier that is closer, easier to monitor, cheaper, and so on, leaving the current supplier with too much capacity. Experienced engineers who have lived through periods of volatility do not forget the lessons of previous upheavals. Figure 1.3 presents a prioritized list of job issues that U.S. electrical engineers were concerned about in 2004. Although salary tops the list, the next most important concern was "job market, security, unemployment."

According to a survey of 2185 U.S. electrical engineers, over 45% had been working in a company that downsized in 2004. Another 19% were part of a company that sold off one of its divisions. Ten percent experienced their company being sold or merged. Even though most engineers kept their jobs during these volatile times, 30% were subjected to salary freezes or reductions.[5] Although this data is not typical for every year in the electrical engineering profession, an engineer can expect to experience periods of job volatility more than once during his or her career.

In start-up ventures, job volatility can be a significant threat. Survey estimates of the failure rate of technology start-up companies run as high as 85%. Although job satisfaction is often measured to be higher at smaller companies, job security may not be as good.

Job loss across an entire industry or across the nation can result from global economic developments. Figure 1.4 shows unemployment data for several groups of U.S. technical professionals between 1982 and 2002. Unemployment for these occupations tends to run much lower than for the average worker in all fields. The volatility over time, however, is significant. Over this two-decade period, electrical

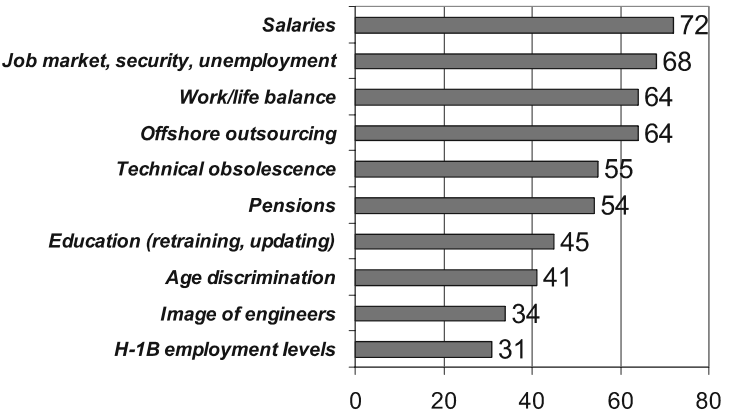

Figure 1.3. Prioritized list of career concerns from a recent survey of 2185 electrical engineers in the United States. Data represents the percent of engineers who listed each item as one of their top concerns. (Source: David Roman, "High Pay, High Anxiety," *EE Times,* Aug 22, 2005, pp. 1–34.)

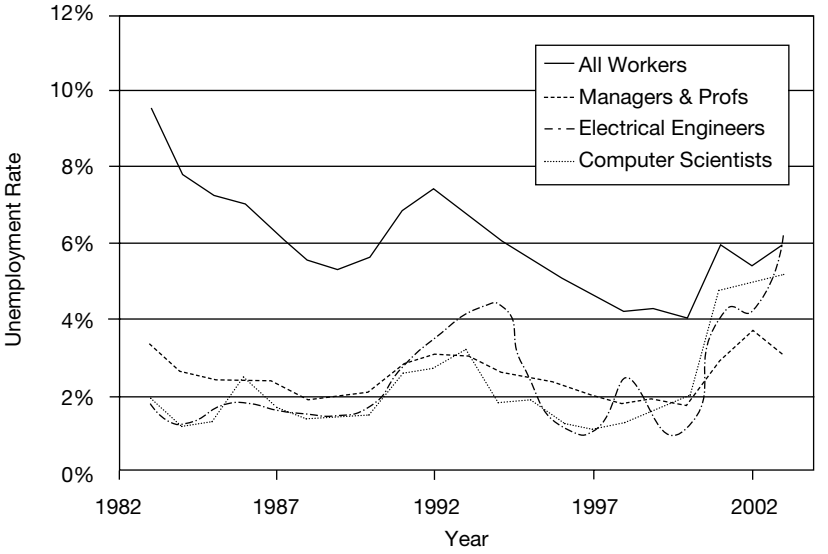

Figure 1.4. Unemployment rate for a number of technical occupations between 1982 and 2002. (Source: US Department of Labor, Bureau of Labor Statistics—Population Survey.)

engineering unemployment rose from nearly 1% to over 4% on two separate occasions. Although a 4% unemployment rate is not considered high for the nation as a whole, it is important to realize that the 3% increase in unemployment rate over a short period (~ 2 years) represents job loss to approximately 150,000 electrical engineers. The worker is not always in control of his/her employment situation.

Workplace volatility and industrywide trends are not the only threat to personal job security. Engineers sometimes find the enemy to be their own management. Power struggles and office politics can lead to stress and job volatility. Workers who are better at technology than playing office politics find themselves easy prey to political careerists in the office. Engineers also become casualties when executives they report to lose high-level power struggles. Unfortunately, there is far too much reality in the newspaper's Dilbert cartoons.

Obtaining financial independence offers significant relief from all kinds of job volatility stress. There is no better insurance against workplace volatility than to possess enough financial resources to be able to live without working. Plant shutdown rumors might cause anxiety in a wage slave with a mortgage and a family, but the financially independent worker is able to view the same rumors as reasons to explore other interesting opportunities.

Possessing the means to retire does not mean you actually have to quit. The ability to retire provides independence for the early retiree or security for the person who chooses to continue working. Financial independence can ease anxieties caused by volatile job markets, corporate politics, management upheavals, outsourced technology, industry downturns, and reorganizations.

Personal Evolution of Attitudes about Work and Family. It should be reiterated that there is a great deal of satisfaction and enthusiasm in the engineering field. It is also true that most engineers will become disillusioned and frustrated with their work or management at some time in their career. These periods of dissatisfaction may be short-lived or they may last for years. Only a small minority of office workers manage to navigate through their entire career without encountering such a period. Career dissatisfaction may be solved by the next reorganization, an industry upturn, the departure of a boss or coworker, or a change in jobs. Sometimes, however, a shift in personal priorities or values leaves technical professionals in jobs that no longer interest them. These people are "retired in place." They arrive at the office and stumble uninspired through each workday. Only the true retirement option may bring inspiration back into their lives.

Even if the job does not become disagreeable or unattractive, it may become less important to an individual. New interests can replace old ones. Becoming a parent or a grandparent, for example, often changes people's priorities. Notice that the third most important job concern of engineers in the survey shown in Figure 1.3 is "work/life balance." It is unlikely that this concern is brought on by too much life and not enough work.

Job Stress. Even when job loss is not an issue, job stress may be. Stress causes a biochemical onslaught that chips away at the immune system, opening the way to cancer, infection, and disease. Hormones unleashed by stress eat at the digestive tract and lungs, promoting ulcers and asthma. They may also weaken the heart, leading to strokes and heart disease. Chronic job stress is like slow poison. Even people who are not sensitized to stress are adversely affected by everything that can go wrong on the job during the day. The self-assurance that comes from financial independence goes a long way toward the reduction of job stress.

Personal Attitude Changes. Regardless of how much financial independence may improve your work attitude or provide a feeling of security, it will not guarantee a successful retirement or enjoyable leave of absence. Someone who has spent a significant portion of his or her life in an office may not have the motivation and interests to fill the days in retirement. For some, achieving financial independence is easier than achieving social and emotional independence.

1.2. IS THERE A RETIREMENT CRISIS?

Future of Social Security

The future of Social Security is clouded by political rhetoric. Financial projections about solvency are based on demographic and economic assumptions of a highly uncertain nature. It is beyond the scope of this book to predict the future of Social