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The Economics of Investing: Risk-aversion and Retirement Decisions

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ABSTRACT:

This thesis is a study of the impact that risk-aversion has on individual retirement investment decisions. The first portion of the work details the decline in Social Security and pensions plan payments over recent years. This finding adds to the urgency for the employee to focus on personal savings to meet retirement goals. Aggregate personal savings have been dropping since 1980, and individuals are making the situation worse by saving in low return bank accounts. Discovering the sources of risk and risk-aversion allow the investor to establish plans to reduce risk in their investments. By controlling for risk factors, the investor can invest more aggressively to ensure herself a comfortable retirement life.

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The Economics of Investing: Risk-aversion and Retirement Decisions

Once upon a time an individual could simply get a job, work hard, and retire comfortably on pension and social security payments, and personal savings without giving the issue much thought. Now headlines like "Can Retirees' Safety Net be Saved? Social Security's Peril and 3 Rescue Plans," "Retirement: Heads, You Lose. Tails, You Don't Win," and "Study Says Retirement Crisis Looming in U.S.,"[1] face the seventy-six million Baby Boomers thinking of retiring in the next decade (Ettorre 8). Retirement has transformed from a comfort zone to panic attack.

For the future retiree who has not broken down in tears and continues to read past the headlines, he or she will notice that the articles are mostly about the problems with social security. Social security is on shaky ground and pensions and personal savings are more necessary than ever. So what? Pensions and personal savings are two-thirds of the retirement income pie. Workers may have some control over how pensions are invested and total control over how personal savings are maintained. Pensions and personal savings should be enough to make up the difference from the loss in benefits from Social Security, right?

The problem is pensions and personal savings have been mismanaged due to a number of factors so that many retirees are not able to live the lives they want. Pensions fail because

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1 See Works Cited page for more information on these sources.

regulation is binding and firms do not always adopt the most beneficial plans. Personal savings are often mismanaged because individuals are risk-averse. To understand how workers can save themselves from retirement squalor, one must first investigate these claims about social security, pensions, and personal savings.

Social Security

According to tax lawyer Albert B. Ellentuck of Colton and Boykin, the following is a table of income distribution based on retirement age from 1993:

Retirement Age	Maximum Yearly Benefit
62	$10,032
63	$10,872
64	$11,700
65	$12,540
70	$15,000

As seen above, if one decides to retire at 62, one would forego 20% of what he or she would have received if he or she had waited to retire at 65 (Ellentuck 70). It sounds easy to simply wait three years to retire but in the real world it is not always that way.

Firms need "to raise the average retirement age for their employees . . . " (Ettorre 8). Some firms have set up benefit and wage packages in a way that makes it costly for the firm if an employee does not retire at a certain age. For example, the employee could be on a deferred compensation or "underpayment-then-overpayment" scheme in regard to their wages (Ehrenberg and Smith 401). Under this agreement the employee is paid below his or her marginal productivity for the first half of his or her career and paid above his or her marginal productivity (MP) the last half of his or her career. The two halves (wage > MP and wage < MP) should be equal for this scheme to be fair to both the employee and the employer (Ehrenberg and Smith 400). If the firm allows the employee

to retire later, it will be extending the second period of the career. This is clearly at the disadvantage of the firm so it will install a mandatory retirement age. A graph entitled "Compensation Scheme" appears at the end of this paper. Other types of benefit or wage plans have the same result making it more difficult for the employee to choose a retirement age.

If a person were to wait to receive benefits at age 65, it will take 20 years for that individual to break even - depending on the cost of money throughout those years (Ellentuck 70). Twenty years is a long time to wait and retirees do not want to spend their much anticipated golden years waiting to break even. This is especially unpleasant considering the American of age "65 can expect to live an average of 20 more years" (Bacon C1). The retiree could spend the rest of his or her life waiting to break even with Social Security.

Retirement can be subsidized by working part-time. Many retirees choose to work because it not only increases current income but also gives them a challenging way to spend their new abundance of time. However, benefits can decrease in size when a person works too much. To avoid a reduction in benefits, the retiree needs to find out at which predetermined level of yearly earnings the program starts decreasing its benefits. More simply stated, how much income is too much?

Though the decrease is avoidable, it ensures that a retiree can only reap a certain level of income based on Social Security and employment income. One suggestion addresses this issue by saying ". . . age requirements for receiving normal retirement benefits should be raised and the limits on earnings of retirees receiving benefits should be raised substantially" (Ettorre 8). This concept is more readily understandable on the graph entitled "Decreased Social Security with Additional Income" in the last section of this paper.

Also retirees need to find out about taxes on social security benefits and how, they too, eat

away at retired life (Ellentuck 70). Benefits can be taxed currently and suggestions for future taxes on Social Security include taxing "[a]ll Social Security benefits that exceed an individual's past contributions . . . " (Ettorre 8).

But at least an individual knows that with the current arrangement he or she will get some type of Social Security support when he or she needs it, right? Think again. "Social security cannot honor its mandate to future retirees without vastly improved prefunding or significantly higher taxes" (Ettorre 8). Ms. Ettorre, whose knowledge is based on Who Will Pay for Your Retirement? The Looming Crisis, goes on say that "[i]f no changes are made, combined Social Security and Medicare taxes could take almost 28 percent of an employee's paycheck by 2030" (Ettorre 8). This means that if policy does not change and Baby Boomers do not plan better, most or even the entire burden of their retirement, as well as future retirement plans, will fall on their children and grandchildren. Americans have two choices under the present retirement system: "dramatically reduced living standards for retirees or unendurable tax burdens on working Americans" (Ettorre 8). With the current Social Security situation in turmoil and plans for remodeling the program in debate, those counting on Social Security payments to help them achieve a comfortable retirement life should look elsewhere.

Pensions

"'America's retirement system is underfunded, overregulated and soon to be challenged by unprecedented growth in the retirement-age population, 'said Lawrence A. Weinbach, managing partner and CEO of Arthur Andersen & Co., who chairs the [Committee for Economic Development] CED subcommittee examining pensions" (Ettorre 8). "This, coupled with the fact that the typical worker is saving about one-third of what is required for adequate retirement, is a debilitating

situation" (Ettorre 8).

Due to Congress, employers who provide pension plans are finding it increasingly more difficult to "develop and maintain" pension funds, thus, "total private pension contributions have declined" in the past ten years (Ettorre 8). The report continues by saying ". . . underfunding of private pensions has been conservatively estimated at $71 *billion* in 1993, and state and local pension plans have been estimated to be only 80 percent funded" (Ettorre 8). "Business and government must fully fund their pension guarantees" (Ettorre 8).

Pensions can also be very restricting. A survey by Employee Benefit Research Institute of Washington D.C. and The Gallup Organization reveals an 81% preference for workers to be "allowed to withdraw their funds before retirement without penalty to cover financial emergencies . . . " (Anonymous 16). Clearly this statement implies that employees want to look to retirement pensions as a liquid asset and as a means to provide money to fund other large investments. If the money put away for retirement is being taken out then how is the money going to grow to support retirement? Not only would the employee be throwing away compounded growth on the money he or she took out but would add the burden of replacing that money later. Employees need savings plans outside of their pension fund to help them acquire houses, educations, and cars. Retirement money should be kept separate to ensure proper growth.

Personal Savings

Based on the aforementioned survey by Employee Benefit Research Institute and The Gallup Organization, "66% of working Americans would like to make their own investment decisions for retirement plans and take the risk of realizing gains or absorbing losses." However, the survey, despite the implications of the above finding, also says that "seven out of 10 employees prefer low

risk and low return investments" (Anonymous 16). Considering this element of risk, how does the individual investor expect to have the amount of money he or she needs for retirement? The answer is most people do not have enough. To emphasize this point, "Declining Personal & Pension Savings" has been provided in the graph section of this paper. An understanding of how to control for risks can be discovered once the sources of risks are uncovered.

Risk Sources

"Investing is synonymous with risk because the future is unknown" (Mayo 285). "Investment in securities is subject to a variety of risks" (Huang 5). Manners of categorizing types of risk depend on the analyst or economist. Herbert Mayo of Fairleigh Dickinson University classifies risk into three groups. Systematic risk arises from the "tendency for security prices to move together" (Mayo 285). In other words, when the general market prices of assets rise or fall, the likelihood of the specific security's price rise or fall (with respect to the market) is high. "Many investors consider price fluctuations to be a significant risk: if the price goes down, the investment is seen as risky regardless of the fundamentals" (Klarman 114). Systematic risk relies solely on the market.

The next risk Mayo recognizes is unsystematic risk or "the risk associated with the security itself" (Mayo 285). If a negative incident such as a law suit occurs, the price of that particular security may drop regardless of the independent of the market. A positive event as with a successful new product, may cause an increase in the stock's price. In an interview via the computer, Robin Diedrich of the Edward D. Jones Research Department states that "news of any law suit of similar case can have an affect on the stock price at any time it depends what analysts are estimating will result" [sic]. She goes on to say that "usually upon the announcement that some potentially negative case is filed it affects the stock, then typically it is not until it gets closer to the verdict or some major

development in the case is made public that the stock will be affected. The final outcome may not even affect the stock if the outcome was widely expected by many analysts" [sic].

Unsystematic and systematic risk together equal much of the risk associated with investing, however, an external risk called "the risk of inflation" is worth considering (Mayo 286). The purchasing power of an individual declines as the price of goods increases. This is a concern for the investor since he or she will want to earn "a return that exceeds the rate of inflation" (Mayo 286). The investor will be better off spending the money on goods now instead of investing it if he or she cannot find a return above the inflation rate (Mayo 286).

Compare saving for retirement through the bank to the rate of inflation. "At the end of 1992, assets held in IRAs alone totaled $724.7 billion, and $250.8 billion, or 35%, were held in banks and thrifts, according to the Investment Company Institute" (Bacon C1). Bank accounts are liquid, insured and low risk.

Banks also give very low rates of return. Certificates of deposit yield a rate of return between 3-5% depending on the amount of time for which it is issued (Bacon C1). "Inflation has averaged about 5% for the past 20 years" (Fortis 2). "Inflation and taxes can erode the return on your investments, impacting your financial well-being. That's why it is important to choose investments that can offer positive returns to offset these negative forces" (Fortis 2). Stocks more than make up for the effects of inflation so they should be considered as an alternative to or in addition to saving money in a bank. The difference between investing in stock or saving in banks is dramatic when seen in the "Stock Growth v. Inflation Rate" graph at the end of this paper.

In addition to this incentive to invest retirement money elsewhere, as of December 19, 1993, "the maximum insurance coverage an individual depositor can get for self-directed retirement

accounts held in one bank drop[ped] to $100,000 from $400,000" (Bacon C1). "The change will apply to depositors with individual retirement accounts, Keogh retirement plans,... 401(k) plans established by corporations, and 457 plans for employees of state and local governments and non-profit organizations" (Bacon C1). This "maximum" may have been installed to encourage savers to look beyond the bank for higher returns when considering retirement.

"'If somebody has this much money in savings deposits for retirement, they may want to think about some kind of an equity investment, 'says James McLaughlin of American Bankers Association" (Bacon C1). Unfortunately many individuals "are inherently risk-averse" and may be giving up opportunities to improve their futures in order to feel safer today (Bacon C1).

While risk of inflation, systematic risk, and unsystematic risk serve as risk categories for Herbert Mayo, Stanley Huang splits risk into five categories: business or financial risk, price-level risk, interest-rate risk, market risk, and psychological risk. By business or financial risk Huang is referring to a risk similar to Mayo's unsystematic risk. "...the price of the securities of a business may decline in the market place because financial insolvency or declining profitability of the issuer" (Huang 5). Unlike unsystematic risk, business risk can have internal (due directly to the business) or external (due to industry or business cycles) components.

Price-level risk is the same as the risk of inflation. "[Price-level risk] refers to the risk of losing purchasing power from returns of fixed income securities because of inflation" (Huang 5). Interest-rate risk is related to price-level risk. "The holders of fixed-income securities are exposed not only to risks from changes in price levels but also to changes in money rates" (Huang 5). Fixed-income securities usually refer to bonds but "changes in money rates can affect ...the prices of common stocks but to a lesser degree" (Huang 6).

Market risk and systematic risk share a common feature: they rely on the market. Changes in the market due to political or social developments cause variation in the price of securities. According to Huang, the investor's "psychology toward equities in general" can greatly effect the fluctuations in prices. Thus "psychological risk refers to investors' emotional instability" (Huang 6). Investors tend to be overly optimistic in strong bull markets. While most investors are timid in weaker bear markets. Investor attitude is a major factor in who should or should not control their financial destiny.

Peter Lynch, former manager of the Fidelity Magellan Fund, considers the following attitudes and personal qualities essential in a successful investor: "patience, self-reliance, common sense, a tolerance for pain, open-mindedness, detachment, persistence, humility, flexibility, a willingness to do independent research, an equal willingness to admit to mistakes, and the ability to ignore general panic" (Lynch 69). An understanding of the market always helps too. The investor must remember that the market fluctuates. If he or she has researched well, the stock price will grow over time. Selling just because the market dropped is the exact opposite of what the investor should do but is the natural reaction of an individual who is uninformed about the market. These attributes alone and coupled with other risk reducers discussed later will reduce the risk involved in investing.

No matter which of the specific categories risk falls into, risk is to some extent a rational fear of individuals. The specific economic risks of owning common stock and how to reduce risk will be discussed later in this paper. First a closer look at risk-aversion is required.

Risk-aversion

The coefficient of risk-aversion has been formulated in order for economists and analysts to associate "a number that measures the investor's response to risk" (Jean 79). The equation describing

this coefficient is as follows: E(U) = E(Vj) - A Var. (Vj), where "the variance of cash inflows [is used] as the measure of risk" (Jean 79). In other words, the equation describes "the investor's response to the size of variance, based on the derivation of utility with respect to the variance" (Jean 79). In the above equation, the constant, A, measures the "exact change in satisfaction" (Jean 79).

Utility describes the level of happiness or satisfaction derived from particular activities. Economists assume that people are rational and that they will maximize their utility at all times (Ehrenberg and Smith 4). The coefficient of risk-aversion equation is making assumptions about the utility function of risk-averse investors. "This coefficient may be either a constant, if the utility function is a quadratic, or a function of the mean if the utility function is a higher degree polynomial or other functional form" (Jean 81). Basically, "an individual whose utility function is concave will be called a risk averter. The marginal utility of a risk averter declines with an increase in his wealth" (Levy and Sarnat 123). This measure makes very strong assumptions about investor's utility function's exact shape (Jean 81). It also goes beyond the scope of this paper.

Risk-aversion prevails even when the investor knows the high rates of return that he or she is passing up to stay "safe." "Risk-averse individuals should not go into a high-reward high-risk venture and vice versa" but that does not mean that risk-averse individuals should not invest at all (Pring 214). This simply implies that risk-averse people need to learn how to minimize risk factors in order to get better than bank returns on their investments.

The most beneficial move on the individual investor's part is to move into a "riskier" investment in order to reap enough returns to retire and maintain their standard of living. The problem is that many people "want a product that comes with the personal guarantee of the agent and the insurance company, a specific rate of return - as high as possible- and no risk. Of course, this is

not possible" (Fabian 50). The stock market offers the "highest compounded returns," according to Fabian, and "moving money from an insured deposit to a stock-market investment is becoming increasingly easy" (Bacon C1). "When asked what he considered man's greatest discovery, Albert Einstein replied without hesitation: 'Compound interest!'" (Fortis 3). Money grows much quicker when interest is being compounded so funds should be kept in a place, such as a mutual fund, where this phenomenon can occur.

Now that risk-aversion has been established, how risk-averse are people? The answer to this question is not easy. Many methods of measuring risk-aversion exist.

Methods of Measuring Risk

Now that the sources of risk and risk-aversion have been established, means of measuring risk can be explored. The range of a security is one method that tracks the stock's low to the stock's high price in a given time period. The range is typically found in financial papers and is referred to when an articles says that the stock is at its lowest price of the time period, such as a year (Mayo 290).

"One problem with using the range as a measure of risk is that two securities of different prices can have the same range" (Mayo 291). For example, two different stocks can both have a range of $30.00 but different percent increments between the prices as they increase. The one with the lower percent increment increase is less risky but the range holds both at the same level of risk (Mayo 291).

The dispersion of prices within the extremes is another measurement associated with risk calculation. Dispersion lists all of the possible prices between the highest price and the lowest price or around the "expected price" (Mayo 291). If the prices are close together, the dispersion

is small and the more stable or less risky that specific stock is. "The larger this dispersion, the greater is the risk associated with a particular stock" (Mayo 291). The amount of dispersion surrounding the expected price is "measured by the standard deviation. Standard deviation measures the tendency for the various prices to cluster around the expected price, it may be used as a measure of risk" (Mayo 292). The amount of risk depends on the size of the deviation. Like the dispersion, the larger the deviation the riskier the investment.

Standard deviation is devised by first examining the range of prices. Then subtract each price in the range from the expected price. Next, "square the difference and add these squared differences" (Mayo 293). Divide the sum by the amount of numbers in the range minus 1. Finally, take the square root (Mayo 293).

Sixty-seven percent of standard deviations for prices are plus or minus one of the expected price (Mayo 293). Knowing the amount of deviation for each security "will help in the selection of individual securities, since the investor will prefer those assets with the least risk for a given expected return" (Mayo 294). In general, investors hoping to reduce risk should pick the stock with the smallest amount of deviation.

Earnings per share or EPS represents the "end result of the performance of a corporation" (Huang 225). Measuring variation of the EPS may be the best way to find the risk involved with a certain security. The most popular way to calculate this variation is to "1. To draw a trend line of earnings growth that was *expected* of the corporation. 2. To calculate a standard deviation or an average deviation of actual EPS from the *expected* trend line of EPS" (Huang 226). "The resulting deviation represents the risk of the stock" (Huang 225). The greater the deviation, the more risk associated with the asset.

Beta coefficients are another option in determining the quantitative risk. This method measures the "responsiveness of the stock's price to changes in the market" (Mayo 297). The percentage change in the price of a specific stock divided by the percentage change in the market defines the beta coefficient. To calculate the "price movement of the market... an index, such as Standard & Poor's 500 Stock Index or any other broad-based measure of stock prices" (Mayo 297).

The beta coefficient measures systematic or market risk because it calculates "a stock's price change relative to changes in the market" (Mayo 297). If the risk is high so will be the beta coefficient. Beta coefficients are also used to determine rate of return adjusted for the risk when evaluating the value of a security (Mayo 459). This is called the capital asset pricing model or CAPM. "This risk-adjusted required return (k) for a stock is expressed in [the following], k= risk-free return + risk premium" (Mayo 259). The equation is used in conjunction with the valuation model. To sum up this model, the stock with the higher required rate of return than expected rate of return is more volatile than the market and, in effect, the most risky (Mayo 480).

While the CAPM model and EPS variation may be more than the individual investor would want to calculate, the other methods should serve the investor as guidelines. After studying measures of risk and risk-aversion, the conclusion that "... every risk averter will prefer a perfectly certain return to an uncertain one with equal expected value" is easily observable (Levy and Sarnat 123).

Economics of Risks and Further Risk Reduction Possibilities

"The risks [specific to common stock] to which investors are exposed can be classified

into two categories: macroeconomic risks and microeconomic risks" (Huang 217). Macroeconomic factors include the risk of a "recession in general business, inflation, changes in market interest rates, and changes in technology, taste, political and social areas" (Huang 217). While none of the macroeconomic risks can be controlled by the investor or any one, they are factors, if they occur, that every person, no matter how he or she invests, will be effected by in one way or another in life. However, the microeconomic risks can be split up into levels of control the investor has over them, given that the investor has control over which companies he or she will invest.

Microeconomic risks include: "emergence of substitutes [for the product the company invested in produces], overcapacity in the industry, excessive price competition, labor strikes, new government regulation, lack of new products, inadequate cost control, excessive leverage, incompetent management" (Huang 217). The first five deal with the industry within which a company competes.

The investor can find out if the industry is worth investing in before deciding to narrow the search to finding a company within the industry. The technology industry, for example, is known to be rather volatile and the automobile industry is cyclical. Neither industry is a smart decision for an investor if he or she lacks the specific skills needed to navigate in these industries successfully so both would be considered risky industries. This information is easily obtained in the financial papers or by finding the stock histories of companies within these industries. These factors cannot be controlled for individually but can be avoided to some extend based on the industry the investor chooses.

The last four factors in the microeconomic risk category fall under company concerns.

The individual has narrowed his or her search to those industries he or she feels are the least risky. Now the investor will research specific companies within those industries to find out their strengths or weaknesses. All publicly owned companies are required to publish their financial statements. Finding out about cost control policies that the company has will help determine if the company has adequate cost control. All four risk factors can be reduced further by reading annual reports, keeping up on news stories, and contacting the financial or investor relations department of the company in question.

Risk can only be minimized by thoroughly researching an industry or company. Once the individual has decided to invest in a company, he or she will want to keep searching for more companies within which to invest. In other words, "[a]nother effective strategy: diversify" (Updegrave 143). "Since a high number of trades unavoidably will unprofitable, it is a wise policy to make bets small so that a significant amount of capital is not risked on any one transaction. As a general rule, it is not advisable to risk more than 5% of your available capital on any one trade" (Pring 217).

This idea of putting your eggs in many baskets may reduce the risk involved in investing in the stock market. However, "diversification for its own sake is not sensible. This is the index fund mentality: if you can't beat the market, be the market" (Klarman 97). Overdiversification occurs because people fear company-specific risks. It's better to know " a lot about a few investments than knowing only a little about each of a great many holdings" (Klarman 97). "Diversification, after all, is not how many different things you own, but how different the things you do own are in the risks they entail" (Klarman 97).

Other helpful tips for the individual investor include measuring "results in real time" and

committing to a mission (Pring 185). Acquiring a nest-egg takes time. A person investing in the stock market needs to remember that it only outperforms other investments over time so realistic goals need to be set. Otherwise the individual will become frustrated and pull out of the market before he or she probably should. Remembering goals is important because the goals are the reason people invest in the first place. If an individual sells before reaching goals, that person may never reach those goals. "If the goal of the accumulation period is growth, then stocks are the logical choice" (Fabian 115).

Alternatives to Investing Independently

If investing in the stock market seems more than the individual can handle, he or she should considering mutual funds. Mutual funds are already diversified and managed for the investor. He or she needs only to choose which fund is best for himself or herself. Funds also may deter an impatient or unknowledgeable investor from pulling out of the market too soon. The fund, depending on the type the investor purchases shares in, usually involves penalties if money is taken out before a certain time.

Consulting a financial advisor or expert is another option. Advisors have a vast knowledge of all the products available and can help the investor choose which is best to meet his or her goals. Advisors can also save the impatient or unknowledgeable investor from himself or herself by providing the investor with advice. Besides, if the investor pulls out and then changes his or her mind and wants to reinvest, he or she will have to pay commission on the investment to the advisor again. The initial commission payment could be worth the some loss in money if it saves the investor money and frustration in the long-run.

To successfully plan for retirement with an advisor one should: "agree on the purpose of

the investment and determine the accumulation period; discuss the investment options suited to the client and select a product; open the account in a money fund and, if appropriate, formulate a strategy to invest in stock" (Fabian 115). "When approached with the right investment tools, good equity management and a solid understanding of the product ... can be extremely [helpful for meeting] retirement [goals]" (Fabian 115).

Conclusion

Saving for retirement can be more aggressively done given that an investor can learn to conquer risk-aversion by becoming knowledgeable about the market within which he or she is investing. Understanding where risk comes from, how to measure it, and even how to change the investor's personal attributes and attitudes toward the market can lead to a reduction in risk. Diversifying investments and seeking higher rates of return allow the investor to more aggressively reach retirement goals. If the investor does not ensure that his or her retirement needs will be met, no one else probably will. Social Security is in turmoil and waiting for the policy makers to fix the system in time for the Baby Boomers to retire may be futile. Pensions may provide some comfort but recent information indicates that some have limitations and mismanagement problems of their own within which to contend. The burden of financing retirement is in the hands of the future retiree and his or her children. To combat risk-aversion through gaining information is the only way a retiree has to secure the comfortable retirement of years gone by.

Works Cited

Bacon, Kenneth H. "Saving for Retirement? Don't Bank on It." Wall Street Journal Eastern Edition (1993): C1-C8.

Cardona, Mercedes M. "Study Says Retirement Crisis Looming in U.S." Pensions & Investments 23 (1995): 38.

Ehrenberg, Ronald G. and Robert S. Smith. Modern Labor Economics: Theory and Public Policy. Reading: Addison-Wesley, 1996.

Ellentuck, Albert B. "Retirement: Options You Must Weigh Concerning Social Security." Nation's Business 80 (1992): 70.

_____ "Employees Prefer Low Risk and Low Returns: A Survey of Attitudes Toward Retirement Plan Investments." HR Focus 70 (1993): 16.

Ettorre, Barbara. "Retirement: Heads, You Lose. Tails, You Don't Win." Management Review 84 (1995): 8.

Fabian, Douglas. "When Risk Makes Sense." Best's Review 92 (1991): 49-50.

_____ Fortis Stock Fund: Invest for Growth Opportunities.... Woodbury: Fortis, 1997.

Huang, Stanley S.C. Investment Analysis and Management. Cambridge: Winthrop Publishers, Inc., 1981.

Jean, William H. The Analytical Theory of Finance: A Study of the Investment Decision Process of the Individual and the Firm. New York: Holt, Rinehart and Winston, Inc., 1970.

Klarman, Seth A. Margin of Safety: Risk-averse Value Investing Strategies for the Thoughtful Investor. New York: Harper, 1991.

Levy, Haim and Marshall Sarnat. Portfolio and Investment Selection: Theory and Practice. Englewood: Prentice/Hall International, 1984.

Lynch, Peter. One Up on Wall Street: How to Use What You Already Know to Make Money in the Market. New York: Penguin Group, 1989.

Mayo, Herbert B. Finance. Chicago: The Dryden Press, 1982.

Passell, Peter. "Can Retirees' Safety Net be Saved? Social Security's Peril and 3 Rescue Plans." New York Times Late New York Edition: (1996): 1.

Pring, Martin J. "Investment Psychology Explained: Classic Strategies to Beat the Markets." Staying One Step Ahead (1993): 184-220.

Updegrave, Walter L. "Protect Your Wealth Against Risks." Money 21 (1992): 142-143.

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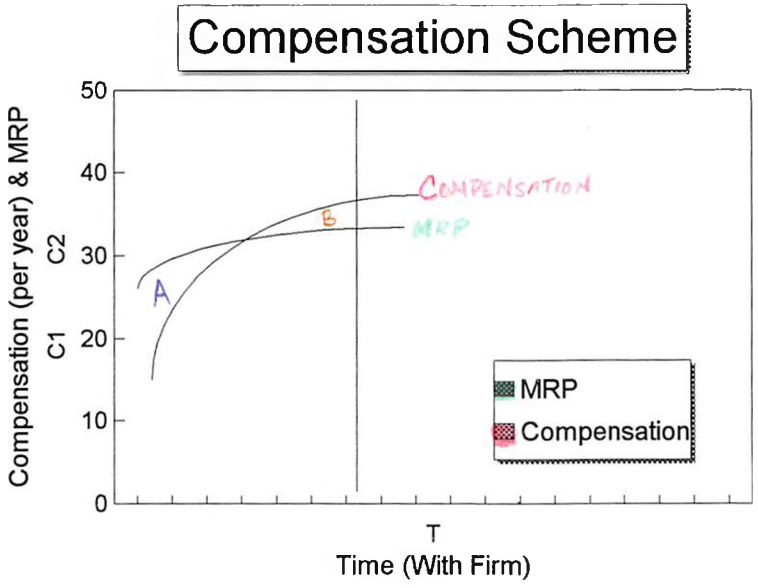
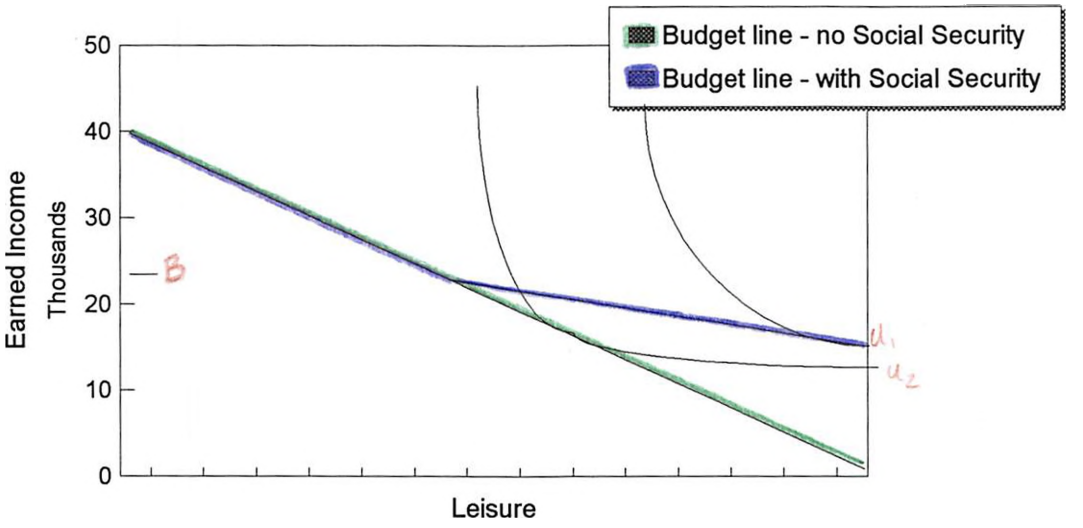
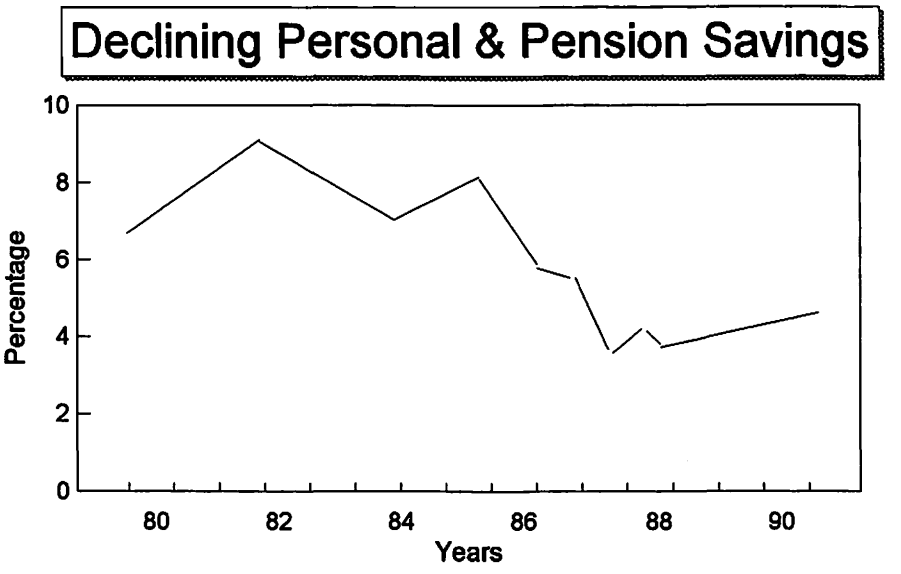


This graph, taken from Ehrenberg's and Smith's model, demonstrates how "underpayment-overpayment" schemes work. The area in A needs to be equal to the area in B for the scheme to be fair. The employer will set madatory retirement age to make sure this is the case. By limiting the amount of years an employee is allowed to work, the firm may cause retirees to take a cut in Social Security benefits.

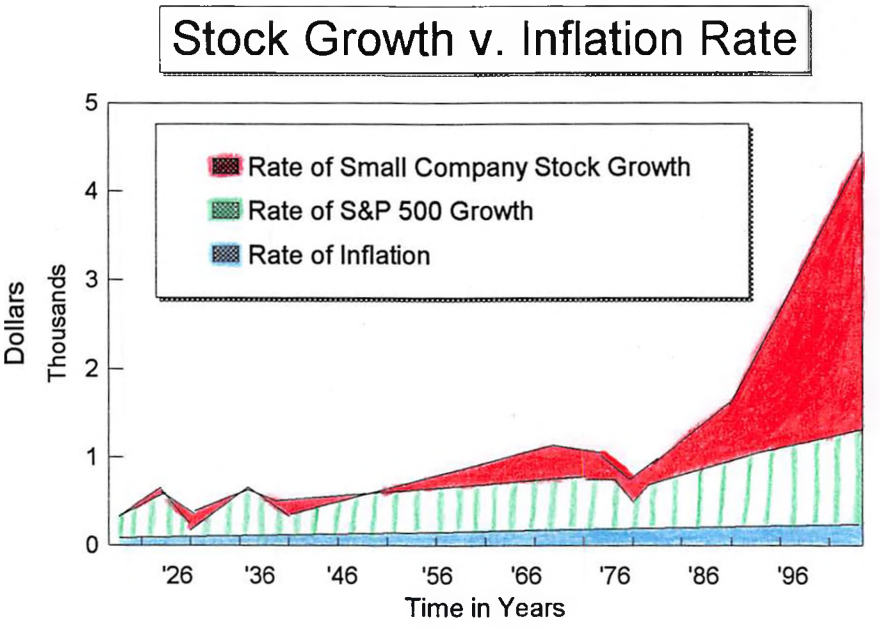
Decreased Social Security with Additional Income



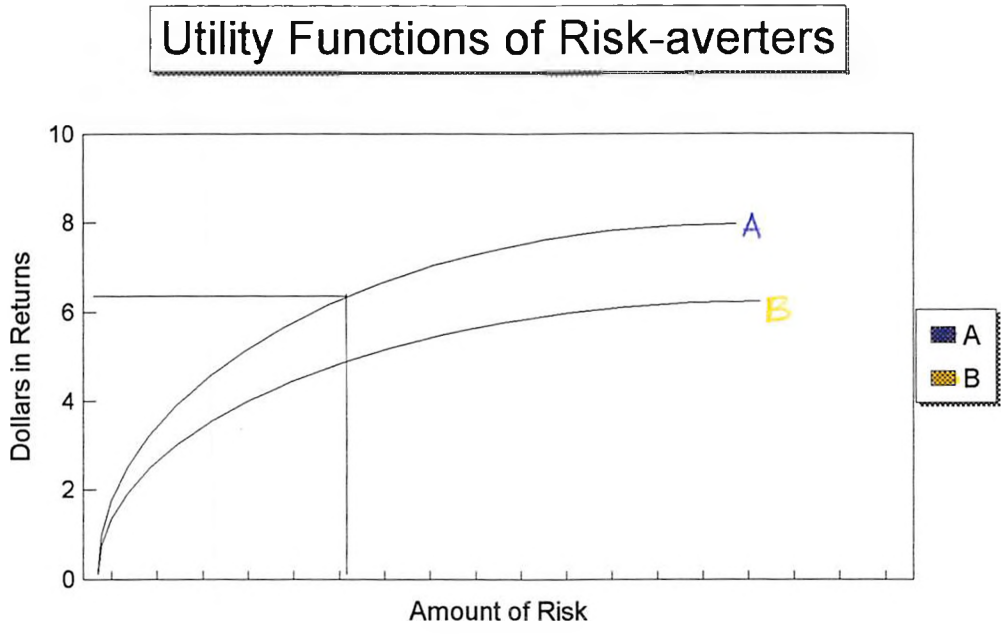
Ehrenberg and Smith show how Social Security effects retirement in the above graph. If a person decides to earn income while receiving Social Security payments, he or she will be taking a cut in payments up to the break-even point, B.



The above graph, taken from Ms. Ettorre's "Heads, You Lose. Tails, You Don't Win," depicts the decline in personal and pension savings from 1980 to 1990. This illustration emphasizes the urgency for increased savings to help fund retirement.



The chart, taken from the Fortis Stock Funds Prospectus, shows how $1.00 invested in small companie or S&P 500 stocks would have fared over the past seventy years. This is compared to the rate of inflation over that time period. The end results in 1996 are: small company stock earning $4,495.99, S&P 500 stocks earning $1,370.95, and inflation growing to $8.85. Remember, most bank accounts earn at or near the rate of inflation.



This Ehrenberg and Smith graph depicts the preferences of two risk-averters. Person A is more of a risk-averter than person B because A requires more money in the form of returns in order to invest in a riskier asset.