



LIFECYCLE INVESTING

A SUMMARY AND ANECDOTES

Leveraging your retirement account, a controversial yet interestingly sensible way to reduce your risk over time.

Prerequisites

It is strongly recommended that you first read the book Lifecycle Investing by Ian Ayres and Barry Nalebuff before going any further. This review isn't about maximizing your returns (although it certainly helps) but about reducing your risk over time. In several comparisons, this leveraged strategy has outperformed many traditional and conventional investing strategies (e.g., constant 75% stock exposure, the birthday rule, etc.). The fascinating part is that the worst-case scenario for 200/83 (200% stock that is eventually deleveraged to 83% stock) demonstrated the same returns compared to constant 75% stock exposure. However, the best-case scenario showed 2x better returns favoring the 200/83 strategy. This would suggest a "free lunch" scenario where you have the same risk, but higher returns. Even in an unusually unlucky scenario where someone starts investing just before a market crash and then experiences another crash before retirement, the 200/83 strategy still had the potential to outperform a constant 75% stock allocation. For these reasons, it appears reasonable to at least consider hearing more.

Please try to read the entire review in its entirety for fully understand what I am trying to articulate. Take your time and research topics or ideas you are unfamiliar with. Last but not least, no matter who is telling you information, the validity of the said information is dependent upon the evidence behind it not who is saying it. With that being said, in the world of finance, even an unlimited amount of evidence can never guarantee what will happen next.

Explain the Samuelson share in the book lifecycle investing and explain the steps to lifecycle investing for someone who is 20 years old and wants to retire by 59.5

Samuelson Share in Lifecycle Investing

The Samuelson Share comes from economist Paul Samuelson's work on optimal portfolio allocation over a lifetime. It represents the constant proportion of wealth an investor should allocate to stocks in each period if they could rebalance continuously and have no constraints on borrowing.

In Lifecycle Investing by Ayres and Nalebuff, they argue that young investors underinvest in stocks because their total lifetime wealth (including future earnings) is much larger than their current savings. Since most 20-year-olds have little invested capital but decades of future earnings, they should take on more equity risk early on—even if that means using leverage.

The authors propose a Modified Samuelson Share:

- Instead of allocating a fixed percentage of current wealth to stocks, allocate a fixed percentage of total lifetime wealth (which includes future earnings).
- This justifies using leverage early in life to reach this allocation since young investors don't yet have much saved capital.
- This way you effectively take much of the risk from your later years in life (where you cannot afford high levels of risk) and bring it to your earlier years in life (where you should have a relatively higher risk tolerance)

Steps to Lifecycle Investing for a 20-Year-Old Planning to Retire by 59.5

1. Estimate Total Lifetime Wealth
 - a. Consider expected salary growth, savings rate, and retirement needs.
 - b. Example: If you expect to earn \$80K/year, increasing at 3% annually for 40 years, your total lifetime earnings could be several million dollars.
2. Use Leverage to Achieve Stock Exposure Early
 - a. Since your future earnings are like “bond-like” income, you should take on more equity risk now.
 - b. Lifecycle Investing suggests using 2:1 leverage early in life.
 - c. This allows you to get closer to your ideal stock exposure (or your calculated lifetime wealth)
3. Gradually Reduce Leverage as You Save More
 - a. As your portfolio grows with savings and market returns, reduce leverage to lower risk.
 - b. By your 30s-40s, you should transition to an unleveraged stock allocation.
 - c. By 50s, start shifting more toward bonds and cash for stability.
4. Diversify and Stick to Broad Index Funds
 - a. Use broad-market, low-cost index funds (e.g., S&P 500, total stock market funds, or global equity funds).
 - b. This maximizes diversification while keeping costs low.
5. Glide Toward a Balanced Portfolio in Your 50s
 - a. By 59.5, you should have a well-diversified portfolio with stocks, bonds, and cash for retirement withdrawals.
 - b. The riskier leveraged phase is now behind you, and your portfolio should seek capital preservation.

See the Lifecycle Investing resources to calculate your Samuelson Share and Present Value of Future Income

- <https://www.lifecycleinvesting.net/resources.html>

How much should I be leveraging every year using Present Value of Future Savings?

Step 1: Calculate Samuelson Share and Present Value of Future Savings

This Shiller Adjustment Calculator provides a tool for estimating your adjusted Samuelson Share (that is, the percentage of the present value of your current and future retirement savings that you should expose to stocks).

First, provide an estimate of how much you think stocks will outperform bonds over the next 12 months. Historically, the equity premium has been 5.04% (using an arithmetic mean).

Expected S&P return	3.01%
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One potential guide to stock performance is the current value of Shiller's P/E10 ratio or CAPE (cyclically adjusted Price Earnings ratio) which can be found at www.econ.yale.edu/~shiller/data/ie_data.xls on "data" sheet row K at bottom.

P/E10	20.48	P/E10 Predicted Annual Return	3.01% <-- If you'd like to accept this as the expected S&P return, input this value into B5.
(updated from http://www.multpl.com/table)			

Second, enter the current value of the VIX (available at <http://finance.yahoo.com/q?s=%5EVIX>)

VIX	22.55%
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Third, enter your RRA (see chapter 7 of Lifecycle Investing and the Risk Aversion calculator).

RRA	2
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And voila, here is an estimate of your Samuelson Share ($= \text{RETURN} / (\text{RISK} \times 2 \times \text{RRA})$).

Samuelson Share	29.6%
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This Present Value Calculator tool helps estimate the present value of your future retirement savings contributions

For example, for a 30-year old with an income of \$75,000 who is saving 5% of income, the present value of his or her future savings is \$119,662. This value does not take into account Social Security.

Assumptions	
Current Age (23-66)	29
Current Income	\$ 150,000
Current Retirement Savings	\$17,000
% of Future Income You Plan to Save for Retirement	5%
Estimated PV of Future Income as a Multiple of Current Income	34
Estimated PV of Future Retirement Savings Contributions	\$ 251,847
Estimated PV of Current Savings and Future Retirement Savings Contributions	\$ 268,847

% of future income you plan to save for retirement is the % of each paycheck you plan to save in the future.

Present value (PV) of current savings and future retirement savings contributions is the combination of your future paychecks, contributions, and current savings (basically a calculation of how much you have today and how much you expect to have later in life from working your job). It does not include investment growth and its purpose is to help you determine how much money you need to have invested at your current stage in life. It will tell you whether your savings at your current stage in life is large enough and whether you'll need leverage or not to be where you should be.

For this example

- Starting amount (29 years old in example)
 - o Total Wealth (Start): (Current Savings) + (Present Value of Future Income) = \$268,847
 - o Samuelson Share Investment (amount to invest/leverage): $29.6\% \times \text{Total Wealth} = \$79,578.71$
- *It should be noted that the Samuelson Share Calculator does come out to 0% if the P/E10 ratio ever goes higher than 27%. This technically means that you should be 0% invested in stocks, but I think there may be a better way to approach this. See section What if Your Samuelson Share is 0%*
- After about 1 year (now 30 years old)
 - o Stock Return (~7% return from S&P500): $\$79,578.71 \times 7\% = \$5,570.51$
 - o New Total Wealth: (Previous Total Wealth of \$268,847) + (Stock Return of \$5,570.51) = \$274,417.51
 - o Rebalance to Samuelson Share (29.6%): Invest/Leverage \$81,227.58
 - The Samuelson Share is a derivative of the volatility index (VIX) and cyclically adjusted price earnings ratio (CAPE); therefore, you must recalculate the Samuelson Share every time because VIX and CAPE are dynamic
 - As you get older your Present Value of Future Income should decrease because it is dependent on your age. However, if your income and savings increase rapidly year over year, your Present Value of Future Income might end up increasing.

Step 2: Apply the Lifecycle Investing Strategy

The book suggests aiming for ~90-100% of total lifetime wealth in stocks, **adjusting leverage downward over time**. Since you start with little invested wealth, leverage helps compensate.

Age 20-30: High Leverage (2:1 or More) - but do not exceed 3x leverage

- Because future earnings dominate your wealth (assuming you aren't a trust fund baby), a 2:1 or even 3:1 leverage ratio is reasonable.
- That means investing \$10,000 to \$15,000 in stocks using margin, futures, options, or leveraged ETFs.

Age 30-40: Reduce Leverage (~1.5:1 to 2:1)

- By now, hopefully you've built savings and have less relative need for leverage.

- Reduce leverage gradually to around 1.5:1 to 2:1.

Age 40-50: Approach Unleveraged (1:1)

- By 40, you've saved a large portion of your lifetime investment wealth.
- Lower leverage to 1:1 (fully invested, no leverage) or a slight margin (e.g., 1.2:1).

Age 50-60: Reduce Risk, Shift to Bonds

- At this stage, you're approaching retirement, so no leverage is advisable.
- Begin shifting a portion of assets into bonds or cash for stability.

Step 3: Approximate Leverage Plan Every 10 Years

Age	Target Leverage (Approximate)
20-30	2:1 to 3:1 (high leverage)
30-40	1.5:1 to 2:1 (moderate leverage)
40-50	1:1 to 1.2:1 (near unleveraged)
50-60	1:1 or lower (shift to bonds/cash)

What if Your Samuelson Share is 0%?

"It's only when the P/E ratio goes above 27.7 that our number crunching suggests that people should completely stop investing in stock".

Shiller PE Ratio



At the time of this writing, the Shiller PE ratio has historically been higher than 27 longer than in the past. In the same lifecycle investing bogle head post, it is discussed on whether you should stop investing into stocks or simply deleverage to 1x invested. Some commenters discussed just continuing to keep 1.5x-2x leverage regardless of the PE ratio so that you don't **time** the market.

This is the case for someone who wrote in the bogle head post

"My partner and I are both around age 40, and we started saving somewhat late. I recently learned about Lifecycle Investing, and read the book over the weekend. The concept of time diversification was very convincing to me. We're currently 85% stock, and I was considering going up to 120% stock or so.

But then Chapter 4 of the book ("But Is Now the Right Time?" section) gave me a pause. Table 4.6 suggests Samuelson Share (i.e., stock %) of only 12% when Shiller's Price/Earnings (PE10) ratio is 26 (whereas it suggests 83% when PE10 is 14). It looks like PE10 is 33.73 now according to this.

I downloaded the spreadsheet to calculate Samuelson Share on lifecycleinvesting.net, and when I put in 33.73, it suggests 0% (because expected S&P return becomes 0%). So now I'm thinking, maybe now isn't a good time to buy more stock (or maybe I should even sell stocks?)"

The topic author responded with a conversation they had with Ayres/Nalebuff back in February 2019. This is Ayres'/Nalebuff's response:

"Thanks for reading the book and for emailing. Barry and I are not certified financial advisors and so can't give you financial advice. Reasonable academics have some disagreement on whether or not any market timing (include PE10 timing ala Shiller) is worthwhile or not. If one chooses not to make a PE10 adjustment, one way of proceeding is to just make the expected equity premium based on some historically based measure or upon some measure of what economist survey suggest future equity premium will be. I leave it to you to consult the literature on this question. Sorry not to be more directive". – Author 1

"If you do not think there is any premium to equities over bonds then there is no reason to take on the extra risk. Today the CAPE is at around 30, which compares to with an average of about 20 over the past half century—in other words, quite expensive. But the CAPE may overstate how pricey stocks are. First, it still reflects (but soon won't) large write-downs from the financial crisis a decade ago. Second, it reflects a different tax regime. Through the first three quarters of last year, the corporate tax cut boosted the earnings measure the CAPE relies on by about 11%, according to Zion Research Group. If last year's tax cut had prevailed over the past decade, the CAPE would be about three points lower.

To avoid the impact of the tax cut, and also the question of whether tax laws will be changed again, investors could look at a valuation measure Mr. Buffett has pointed to: The market capitalization of U.S. stocks as a percentage of gross national product. Right now, that measure stands at about 159% which isn't far from the 171% it hit during the dot-com bubble.

Of course, no single measure can really capture how under or overvalued the stock market might be—there are too many moving parts. But looking across a variety of them suggests the market is hardly a bargain. Some individual stocks almost certainly are, but for both Mr. Buffett and regular investors, identifying them is no easy task". – Author 2

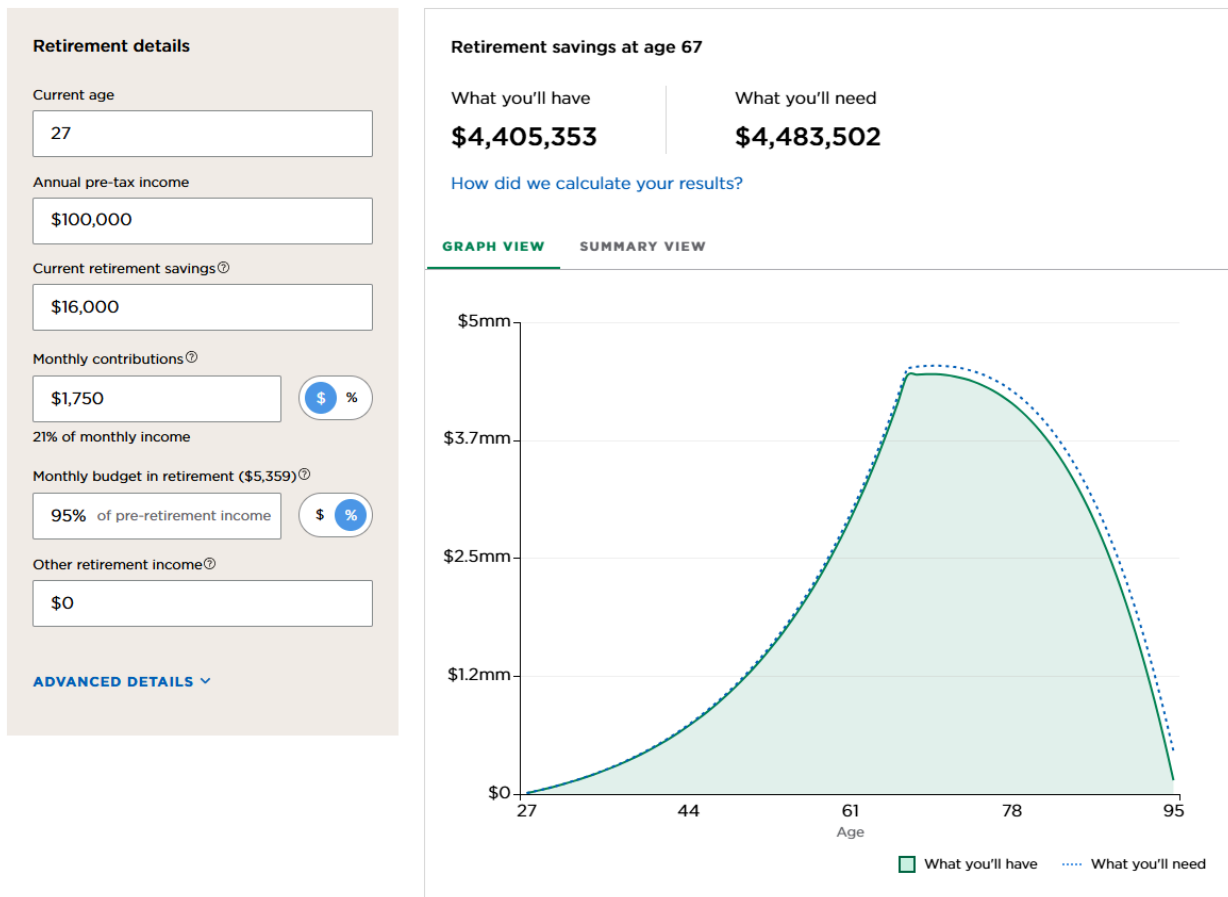
This suggests ignoring market timing strategies based on valuation metrics like the CAPE ratio, which often rely too much on hindsight and don't reliably predict future returns (although to be honest nothing reliably can). Instead, they recommend focusing on the equity risk premium (the extra return investors expect from stocks compared to safer investments like government bonds). This premium helps guide long-term investment decisions. Even though both stocks and bonds may seem expensive right now, the difference between their expected returns (the equity risk premium) is still close to historical averages, meaning your overall investment strategy probably doesn't need

major changes. To estimate this premium, you subtract the risk-free rate (like the yield on U.S. Treasury bonds) from the expected return on stocks. For example, if stocks are expected to return 8% and bonds 4%, the equity risk premium is 4%. You can find current estimates from financial analysts or sources like Professor Aswath Damodaran at NYU, who regularly updates his data. As of July 2025, Damodaran's implied U.S. equity risk premium is around 3.94% to 4.21%, depending on the method used. Some firms like Kroll also publish their own estimates, with their current recommended premium at 5.0%. These numbers help investors decide how much risk they're being compensated for and whether to adjust their stock allocation slightly, though the advice here is to keep changes small and only if you're confident in your estimates.

In general, when the equity risk premium is <3% this indicates bonds may be a better investment, 4-6% suggests a 60/40 or a 70/30 stock to bond allocation, and >6% suggests potentially having a 100% stock portfolio. You will generally only see >6% during market downturns or recessions.

What if I am close to my retirement goal, should I deleverage early?

Yes, if you were lucky enough to have gone through enough bull markets to rocket into your retirement goal, then you should deleverage and work on capital preservation (shifting into relatively safer assets such as bonds). Your retirement goal can be calculated by using Nerd Wallet's Retirement Calculator.



Ideally, you should try to stick to leveraging in life stages, however you can consider deleveraging based on the amount of capital you have now relative to your retirement goal by following two rules

1. Do not exceed 2x leveraged
2. Your retirement goal divided by your total capital is how much you should have leveraged (but do not exceed 2x leverage)
3. This means you only really start deleveraging once you are somewhere more than 50% of the way to your retirement goal.

What if you are close to your lifetime wealth by the time you are 30? Should you deleverage then? Should you start incorporating bonds after you are deleveraged, or can you do it earlier?

% of Lifetime Wealth Invested	Status	Leverage Approach
<10% of lifetime wealth	"Small" - Early Stage	High leverage (2:1 to 3:1)
10-30% of lifetime wealth	"Growing, but still early"	Moderate leverage (1.5:1 to 2:1)
30-50% of lifetime wealth	"Catching up"	Reduce leverage (1:1 to 1.5:1)
>50% of lifetime wealth	"Well ahead"	Fully deleverage (1:1, no margin)

Per Lifecycle Investing, you should stay 100% in stocks (S&P500) until you are fully deleveraged, and only then start incorporating bonds. The core idea is that:

1. Early in life, your future earnings act like a "bond", so you don't need actual bonds in your portfolio.
2. Stocks have higher long-term expected returns than bonds, so maximizing stock exposure (even with leverage) is optimal when young.

Once you've deleveraged and built substantial wealth, you can begin reducing risk by adding bonds.

When to Start Adding Bonds? Ideal Approach (Per Lifecycle Investing):

- Stay 100% stocks while leveraged and during early unleveraged years.
- Start adding bonds only after age 50-55 when retirement is near.

In bear markets should you manage your portfolio to decrease your leverage and how often should you rebalance your portfolio?

Yes, after establishing your Relative Risk Aversion you might have opted for either 2x or 3x leverage (however I recommended based on my personal research not to exceed 2x leverage, but you could consider 3x leverage after a recession). It's important that you stay within that leverage during your respective stage in lifecycle investing.

- The book gives the following case scenario with the hypothetical investor named Andrew.
 - When Andrew bought the SPY contract in January 2009, the index was at 927. Three months later, the index was at 835, and with that decline the value of his equity stake fell from \$4,770 to something like \$3,850. Since he was then exposed to \$8,350 of S&P, his leverage grew to 2.17. In theory, Andrew should have sold some stock. The problem is that he can't just go and sell a small amount to bring him back to 2.0. Contracts are sold in units of 100. He could go and close out his trade, recognize the loss, and then rebuy a new LEAP with a strike price closer to half of the current trading price. But the transaction costs of doing this type of trade would be prohibitive. Each time he would have to pay the bid-ask spread. An additional cost of having a small amount to invest is that it makes rebalancing impractical. In the case where prices go up, Andrew would be called on to invest more money. The problem is that he doesn't have more money to invest. He can only close out his position and rebalance. The capital gains would provide the additional funds to do so. Provided the account is inside an IRA, taxes wouldn't be an issue. (Outside an IRA, this would be a real problem.) The remaining question is whether the time hassle along with the transaction costs make this worthwhile. Our view is that it isn't worth the cost of small changes in leverage. The goal is to be at 2:1. If you end up at 2.2:1 or 1.8:1, that's close enough. The market needs to move 10 percent before you should worry about rebalancing.
- You should deleverage by either adding more capital (if you can afford to) or by closing positions (even in a losing trade).
- In the studies, rebalancing was only done yearly. Frequent rebalancing has many drawbacks from a tax (unless it's in an IRA) and fee/commissions standpoint. I don't think you should rebalance more often than bi-annually unless your leverage goes beyond a factor of 0.5, but the book recommends rebalancing every quarter and no more (unless there is a big move in the market that extends past the target leverage factor of 1.8x-2.2x).

Implementation of leverage through LEAPs

1. Buy long-term LEAP call options on a broad market index such as the S&P 500 with an expiration date of at least two years in the future. They need to be deep in the money (cost: approx. 50% of the underlying) to get a 2:1 leverage. Over time you would have to swap the options in order to still have approximately 2:1 exposure.

2. Instead of SPY, there are other whole market ETFs with better prices that will allow you to buy LEAPS if SPY's price is too high. Additionally, you don't need 100% of your capital in options. You can do 50% in normal stock, 50% recreating a 3x leverage using LEAPS. This is roughly 2x leverage in your total account, but still some liquidity for rebalancing or other adjustments.
3. Example
 - a. Imagine a young investor named Alex, who is 30 years old and has the following financial profile:
 - i. Current savings: \$50,000
 - ii. Expected future earnings (present value of future income): \$450,000
 - iii. Total wealth: \$500,000 (current savings + present value of future earnings)
 - b. Determine the Samuelson Share:
 - i. Let's assume the Samuelson share suggests that Alex should invest 30% of their total wealth in riskier assets, like stocks.
 - c. Calculate Stock Investment:
 - i. Total Wealth Calculation:
 - ii. Alex's total wealth = \$500,000
 - iii. Samuelson Share Investment Calculation:
 1. Percentage to invest in stocks = 30%
 2. Amount to invest in stocks = Total Wealth $\times$ Samuelson Share
 3. Amount to invest in stocks = \$500,000 $\times$ 30% = \$150,000
 - d. Since Alex's current savings are only \$50,000, they need to consider using leverage or other financial instruments to achieve an exposure equivalent to \$150,000 in stocks.
 - i. Buy enough LEAPS until you have \$150,000 worth of SPY (unless you only want a max of 2x leverage then \$100,000)

Why this theory might fail in practice

This basically boils down to human psychology and the tendency to change strategy over the course of time. The average investor is unlikely to implement this theory so stringently over time (due to unforeseen circumstances). Especially in the event of losing all savings (in a crash such as COVID), most investors would probably go back to a simple buy & hold strategy without leverage.

- Ask yourself would you have the guts to continue to roll over those options when they are deep out of the money (OTM) (remember they expire worthless) and there is no indication of how long it will take to recover?

In the end, the best strategy is the one that you have enough conviction to follow year-in, year-out.

What if you have a mortgage? Isn't that a form of leverage?

Yes, it is a form of leverage but adding it to the overall portfolio makes things quite complicated. You could try Beta weighting real estate to S&P500 to simplify it, but this might end up causing an over-simplification that we would later come to regret.

To try to explain it from a Bogle heads blog discussion on lifecycle investing:

1. Mortgage as a Negative Bond

- **Concept:** A mortgage can be viewed as a negative bond because it represents a liability that needs to be paid off over time.
- **Calculation:** When calculating your net worth for investment purposes, you should include the mortgage as a debt. This means subtracting the mortgage balance from your total assets.

2. Future Savings Contributions

- **Without Mortgage Payments:** Initially, you might calculate your future savings contributions without considering mortgage payments. For example, if you make \$50k annually and spend \$25k on living expenses plus \$10k on mortgage, you might initially consider saving \$15k annually.
- **Including Mortgage Payments:** However, it's important to adjust this calculation to reflect the reality of mortgage payments. The principal portion of your mortgage payments should be considered as part of your savings because it increases your home equity.

3. Present Value of Mortgage

- **Discounting Future Payments:** To accurately account for a mortgage, you should calculate the present value of all future mortgage payments (both principal and interest). This involves discounting these future payments to their present value using an appropriate discount rate.
- **Simplification:** A simplified approach is to use the current mortgage balance as its present value, assuming the mortgage interest rate is close to the discount rate.

4. Net Worth Calculation Example

You have 200k in savings, a 300k mortgage, a 500k house (so you have 200k in equity). Also you make 100k a year and spend 50k a year outside of mortgage payments (food, travel, house repairs, etc.). You will work for 10 more years. So, you calculate you'd save $100k - 50k = 50k$ a year. Now you know you won't actually save that much because there are mortgage payments to consider but let's ignore that for now. So that's a future savings contribution of about $10 \text{ years} \times 50k = 500k$. You have 200k in savings, 500k in future savings and a 300k mortgage. Your net assets are $200k + 500k - 300k = 400k$ for purposes of Lifecycle Investing. Say you want a 60% stock retirement portfolio in retirement. So, you'd put $400k \times 0.6 = 240k$ in stocks. You only have 200k so just stay 100% stocks and maybe use leverage to get to 240K. Include house value and mortgage in calculating debt and net worth.

- **Scenario:** Suppose you have \$200k in savings, a \$300k mortgage, and a \$500k house (resulting in \$200k equity). You make \$100k annually and spend \$50k on non-mortgage expenses.
- **Future Savings:** You plan to save \$50k annually for 10 years, totaling \$500k in future savings.
- **Net Assets:** Your net assets would be calculated as \$200k (current savings) + \$500k (future savings) - \$300k (mortgage) = \$400k.
- **Investment Allocation:** If you aim for a 60% stock allocation, you would invest $\$400k \times 0.6 = \$240k$ in stocks. Since you only have \$200k currently, you would invest all of it in stocks and/or apply leverage to hit 240K

5. Primary vs. Secondary Home

- **Primary Home:** The equity in your primary home can be considered a bond-like asset because it saves you rent, providing a stable and predictable benefit.
- **Secondary Home:** Equity in a secondary home is riskier and should be treated differently. It might be considered a mix of stocks and bonds depending on the risk associated with the property.

Summary

The discussion emphasizes the importance of accurately accounting for mortgage payments and balances when planning your investment strategy. By considering the mortgage as a negative bond and adjusting future savings contributions accordingly, you can better understand your net worth and make more informed investment

decisions. The goal is to balance risk and return while ensuring that your investment strategy aligns with your financial goals and constraints.

Is it cheaper to buy the S&P500 on Margin instead of getting LEAPs?

It depends. A reddit user looked into this and outlined the following:

Doing some quick math, it seems like buying on margin is much cheaper than buying LEAPS, even in this period of much higher interest rates compared to when the lifecycle investing book was written. Let's look at some numbers. SPY is at \$522 right now, for reference.

Option 1: \$100k in SPY, plus another \$100k in SPY on margin at Interactive Brokers. An interest rate of 6.83% compounded daily is an annual cost of \$7,067.95. I itemize deductions instead of taking the standard deduction, so I get 22% of that back, leaving me with \$5,513.00 in margin fees. But I also get 1.22% dividend yield on 200k of investment, or \$2,440. 15% of that I lose to capital gains tax, leaving me with \$2074. That leaves me with a total cost to borrow of \$3,439, or 3.44% annually.

Option 2: ~\$200k in SPY LEAPS. I can't buy fractional options, so let's say it's 4 of the Jan 2026 \$260 calls, which is trading for around \$280 at the moment. That is a \$20 premium, which is \$8,000 cost to borrow over 21 months, or \$4,571.43 annualized. I've effectively gotten a \$104,800 loan with these LEAPS $((\$522 - \$260) \times 400)$, so that's a total cost to borrow of 4.36%. Nearly a whole point higher than just buying on margin.

I know I'm hand waiving over a few details, but I don't think it changes the conclusion that buying on margin comes out cheaper, even today (2025).

As someone previously discussed, the pro of buying calls instead is that you never get margin called, sleep better, and are not subject to floating margin rates which may be hard to predict. However, the difference of 1% a year is somewhat equivalent to buying and holding a high expense ratio fund which can eat up profits overtime. If you really wanted to manage it, you could alternate between buying on margin and buying LEAPs depending on margin rates. However, I personally only plan to do this strategy in my Tax advantaged accounts which do not allow for margin trading.

What about buying the S&P500 using leveraged ETFs?

The idea of putting all of your money into a 2x leveraged ETF such as SSO sounds ideal because it's easy. However, there are many factors that actually make this one of the worst ways to achieve 2x leverage in the long term. The first and probably biggest reason is volatility drag, which is the difference between average returns and compounded returns. The higher the volatility (up and down movement) the less you end up with. For example, if you start with \$100 and SPY goes up 5% you now have \$110, but if on day 2 SPY goes down 5%, you lose 10% on \$110 or you lose \$11, where now you have \$99. So, SPY didn't move relative to day 1, but you still lost \$1 even though SPY didn't move, this is volatility drag and these losses can compound over time. Volatility drag, as you can see, hurts the most in choppy, sideways markets. The next reason is through daily rebalancing mechanics; every day the fund adjusts its exposure back to exactly 2x the index which means it will buy high and sell low when volatility spikes therefore bleeding returns over time. The third and not the last reason is the expense ratio which ends up usually being much higher than the index it's tracking.

What about buying the S&P500 using E-mini futures contracts?

This might be the cheapest way to leverage your money in the S&P500. The thing that we have to keep in mind is that you cannot buy stock. You can own the futures through "contracts" or "options contracts". For futures, "contracts" are essentially like stock, but one single contract is worth 50x more than one share of SPY. In other words, when the E-mini futures index goes up one point, you make \$50. Other things to consider is that the E-minis do not have dividends and you have to roll over your contract every quarter because contracts have an expiration date. Because rolling is essentially just closing and reopening the contract it would be the cost of the fee which standardizes around \$13 per contract or \$52 a year. Additionally, the leverage you obtain for E-mini futures is through something called SPAN (standard portfolio analysis of risk) margin which allows you to buy a contract for 1/10th of the price, giving you effectively 1:10 leverage.

Therefore, doing this strategy through E-minis requires that you have cash on the side to make your overall account only 2:1-3:1 leverage. For example, if you have \$1,000,000, you should only buy \$200,000 worth of E-mini contracts and leave the rest of the money in cash (\$800,000 in cash) for 2:1 leverage (or multiply your total account size by 0.2 to determine how much you need invested); also, this same thinking applies to /MES (micro E-minis, which are 5x more than one share of SPY) as well. Lifecycle investing calculates the implied interest rate of buying E-mini futures to be around 1.2%

where LEAPs are around 2.98%-4.68% (from bid-ask spreads, implied volatility, and opportunity cost of forgoing dividends).

Summary comparing true 2x leverage, 2x leveraged ETFs, LEAPS, and Futures

The returns will be compared using their compounded annual grow rate (CAGR), a financial metric that measures an investment's average annual growth rate over a specific period, assuming that profits are reinvested. True 2x leverage is borrowing the actually cash to invest as opposed to using a vehicle. The following table is over a 15-year period.

Strategy	Estimated Ending Value (on \$100,000)	Estimated CAGR	Key Considerations
Borrowed 2x cash to buy SPY	~\$1,100,000–\$1,150,000	~21.5–22%	Clean compounding; interest costs (~5% annually); margin call risk
SSO (2× ETF)	~\$550,000–\$600,000	~15–16%	Daily reset volatility drag; embedded financing costs; expense ratio (~0.9%)
LEAPS (Quarterly Roll)	~\$650,000–\$700,000	~16–17%	No daily reset drag; option decay and roll costs (~0.1% per quarter)
Futures (/ES Quarterly Roll)	~\$1,050,000–\$1,100,000	~19–20%	No daily reset drag; minor roll and transaction costs (~0.05% per quarter)

Running an example of a Roth IRA in Interactive Brokers buying E-mini futures contracts

On July 11th, 2025 I called interactive brokers to discuss the idea of trying to maintain 2x leverage in a Roth IRA through E-mini futures contracts. Generally, in a margin account for /ES trading at 6300 we would be looking at a buying power of around \$33,400. This controls about \$315,000 which would put your leverage at about 9.4x. In a Roth IRA because they are much less flexible with margin (SPAN margin is a different story), per interactive brokers, your buying power requirement is 2x what you would normally see or $\$33,400 \times 2 = \$66,800$ which still controls \$315,000 meaning your leverage is at about 4.7x (or ~1:5), but this is plenty for the lifecycle investing strategy. This means if you had \$1,000,000, you should only buy \$400,000 worth of E-mini contracts and leave

the rest of the money in cash (\$600,000 in cash) for 2:1 leverage (or multiply your total account size by 0.4 to determine how much you need to invest). If it goes to 0.3, which could happen in an up move, it will hit 1.5x leverage ($0.3 \times 1,000,000 = 300,000 \times 5x \text{ leverage} = 1,500,000$). If it goes to 0.5, which could happen in a down move, it will hit 2.5x leverage ($0.5 \times 1,000,000 = 500,000 \times 5x \text{ leverage} = 2,500,000$). Therefore, at least in a \$1,000,000 account, you don't want the amount invested into E-mini contracts to deviate less than \$300,000 or more than \$500,000.