

# Behavioral Finance

## Money Management

# Money Management Introduction

We have now completed our examination of some of the more common biases and errors that lead us to make sub-optimal decisions.

We will now look at a range of financial decisions faced by individuals, institutions, and even the entire market. We will try to identify the biases that can explain why many people appear to make errors in their financial decision-making.

We begin by looking at personal investing, and we discuss some investing rules that everyone *should* adhere to, but most people *don't*.

We will analyze why these rules are so often broken, by using the lens of behavioral decision-making to spot why the errors keep creeping in.

# A Brief Primer on Mutual Funds

- A Mutual Fund is an investment vehicle, operated by a professional portfolio manager, and funded by both individuals and institutions
  - Mutual fund portfolios are structured to match investment goals as stated in their prospectus
  - The portfolio manager's goal is typically to outperform relative to an index such as the S&P 500, rather than to provide an absolute rate of return
- Huge amounts of money are invested globally with mutual funds
  - Total worldwide mutual fund value is greater than \$20 trillion
  - US mutual funds account for slightly more than 50% of all global funds
- There are two broad classes of fund:
  - Actively managed funds: the portfolio manager seeks to outperform her stated index by selecting which stocks to buy, hold or sell, while still maintaining a well diversified portfolio
  - Passive funds: the portfolio simply mimics a particular index such as the S&P500, Nasdaq, or MSCI (global equities)

# Active vs Passive Mutual Funds

- Mutual fund fees vary from around 0.2% (for passive funds) to as much as 2.0% of portfolio value
  - Example: if you invest \$10,000 in a fund with a 1% fee, you will pay \$100 each year to stay in the fund.
- Do active managers *add value* to justify the higher fees?
  - If an actively managed fund charges 1%, it needs to outperform its index by at least 0.8% to justify the additional fee relative to a 0.2% passive fund on the same index

Do actively managed funds outperform their index sufficiently to justify the higher fees relative to passive funds?

# Active vs Passive Mutual Funds

## *Actively Managed Funds Usually Underperform*

- A study in 2008 found that, out of 2,500 mutual funds available to US investors, the majority underperformed:
  - The average fund performance (adjusted for risk) was minus 1% relative to their benchmark (most often the S&P 500).
  - The *median* (or middle) performance was minus 1.8% relative to their benchmark, which tells us that a larger number of the mutual funds *underperformed* than *outperformed*.
- As previously noted, actively managed mutual funds also charge higher fees than passive funds.

Can we identify which funds  
will *outperform* in future,  
and invest in those?

# Active vs Passive Mutual Funds

## *Can We Identify Future Outperformers?*

- Looking back, we can identify active managers who have shown outstanding performance in the *past*:
  - Fidelity manager Peter Lynch (the Magellan Fund) beat the S&P500 in 11 out of 13 years from 1977 - 1989, with an average annual return of 28%, relative to 18% for the S&P 500.
  - Julian Robertson (Tiger Fund) built an \$8 million fund in 1980 to \$7.2 *billion* by 1996.
- If we had started investing in the early 1980s, could we have identified which of the thousands of portfolio managers at that time would go on to produce Peter Lynch's or Julian Robertson's returns over the next 30 years?
  - Probably not!
  - No one had heard of the Magellan Fund in 1977...

Why not invest with funds that have *already* outperformed?

# Active vs Passive Mutual Funds

## *Should We Invest in Historically Successful Funds?*

- There are a number of reasons why it's tough to invest in the funds that have already proven hugely successful
  - Fees: To participate in Julian Robertson's Tiger Fund\* at the peak of its success in the 1990s required an investment of at least \$5 million
  - Manager turnover: most mutual fund managers stay with a particular fund over a relatively short period of time (years, not decades). A fund that has been doing well historically may change managers without notice, with a resulting change in performance
  - Change in performance: just because a manager has done well in the past, does not guarantee future success
    - The Tiger Fund dropped in value by almost 75% between 1998 and 2000, largely as a result of the dot-com bubble

Can we be sure that strong historic returns are skill vs luck?

\*Technically, Tiger was a hedge fund, not a mutual fund. Most hedge funds require minimum investment amounts of \$0.5 million or more, and are permitted to take more risk than mutual funds

# Active vs Passive Mutual Funds

## *Can We Identify Skill vs Luck?*

- Suppose 500 people each toss a coin 13 times, and record the number of heads.
- The winner of this Game of Chance is the one who tosses the most heads
- Over hundreds of repetitions of this game, the winning player will average between 11 and 12 heads.
- We can make the following statements about this game:
  - We can be certain that *someone* (or several people jointly) will win
  - We can be reasonably confident that the winner will get 11 or more heads
  - We don't know, *ex ante*, *which* of the 500 players will be winners
- Peter Lynch's Magellan fund provided superior returns relative to its benchmark for 11 out of 13 years.
  - Can we be sure he wasn't just the lucky winner in a game of chance?
  - Perhaps he was simply the player who tossed 11 heads over 13 coin tosses...



# Active vs Passive Mutual Funds

## *The Benefits of Passive Index Funds*

- Passively managed index funds provide a number of benefits relative to active funds
  - They have minimal sales charges and very small annual expense charges
  - They do relatively little trading, which reduces *their* transactions costs and thus saves *you* money
  - They tend to generate low taxable gains relative to an actively managed fund, because they don't turn over their holdings very often
- There are a number of risks associated with investing in actively managed funds relative to index funds, as we've discussed:
  - Extensive historic evidence suggests that active funds underperform passive funds
  - We cannot be sure that a fund with historic *outperformance* is due to luck vs skill
  - It's hard (impossible?) to select the active managers who will be among the minority who outperform in future

So why do investors continue to invest with actively managed funds? Can we identify behavioral biases that can explain this apparent anomaly?

# The Life Cycle Guide to Investing for Retirement

- Let's suppose that you are young, and thinking about how to invest for your retirement. How should you allocate your portfolio between high risk equities and lower risk bonds?
- Many financial advisors encourage us to invest our retirement fund assets primarily in equities when we are young, since these are likely to generate a stronger return over the long-run, and time will smooth out the higher volatility inherent in equity markets.
- These same advisors encourage a move towards safer assets as we get older; they point out that there may not be time for our pension portfolio to recover from an extended bear market, if this happens shortly before we retire.
- Once we've retired and start *withdrawing* money rather than *adding* to it, we would like the portfolio to maintain its value so that we can rely on the income that it generates.

# Life Cycle vs All Equities

*From 1964 - 2007*

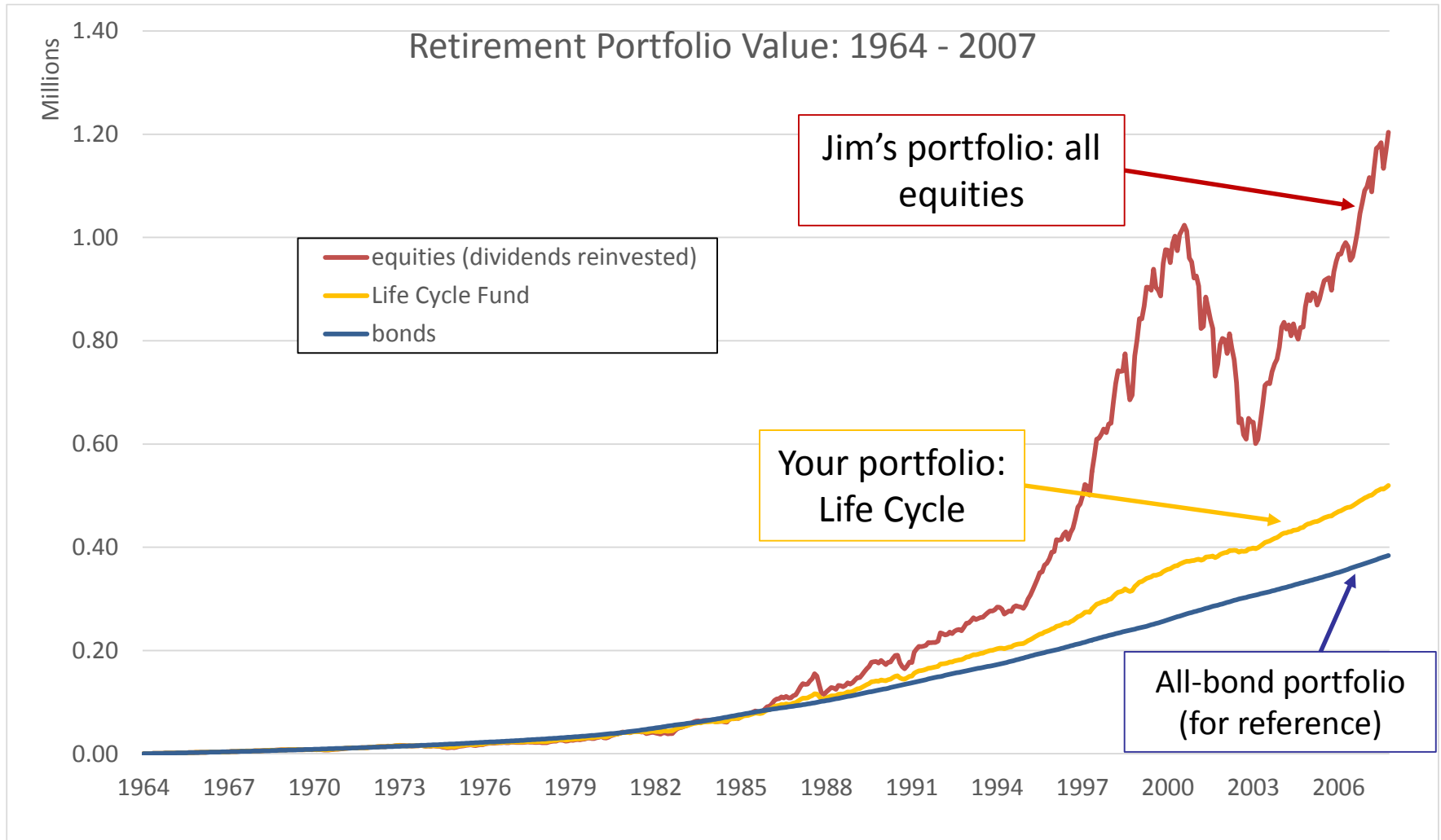
The year is 2007. You are 63 years old, and will retire in 18 months. Every month since you were 20, you added \$100 into your retirement account.\* Your initial asset allocation was 90% in equities, and 10% in safe Treasury bonds. Over the last 40 years, you have gradually moved your portfolio from 90% equities and the remainder in bonds, to one in which the equity portion is only 10% of the portfolio. Your retirement fund is worth about \$520,000.

Your friend Jim, who is the same age as you and has also put \$100 in his pension each month since the early 1960s, boasts that *his* retirement nest egg is worth more than \$1.2 million, because his retirement money has always been invested in the S&P 500 (with dividend payments automatically reinvested). He and his wife plan to travel extensively over the next few years, using his accumulated retirement funds to live out their golden years in style.

\*We've simplified this example – most people's contributions to their retirement funds increase commensurately with income.

# Life Cycle vs All Equities

## *From 1964 - 2007*



# Life Cycle vs All Equities

*From 1964 - 2009*

Let's jump forward 18 months, to early 2009. You and Jim have both just retired, right at the end of the worst bear market in decades. US equities have fallen by close to 50%.

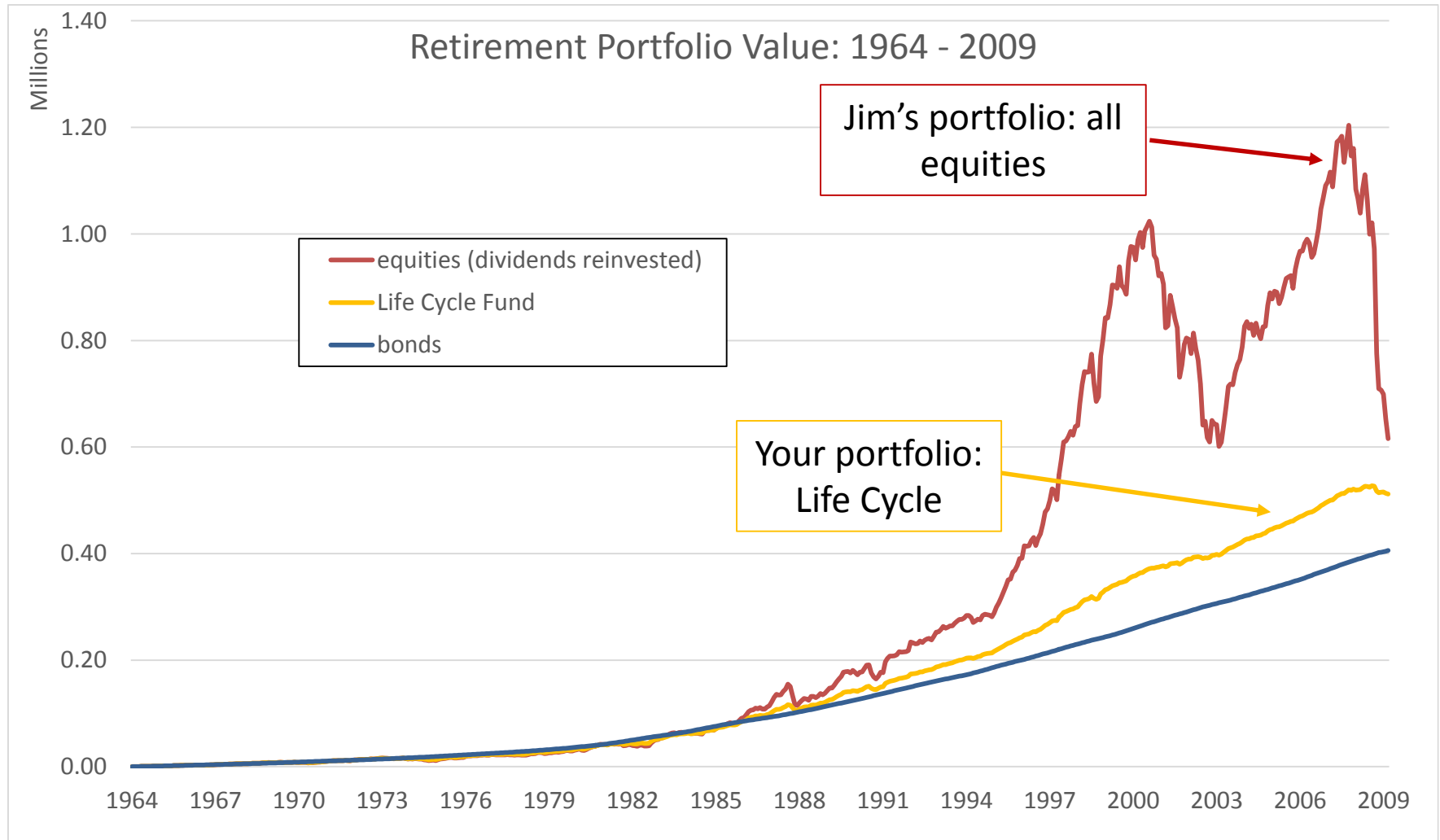
Your retirement fund has held up well, since it has been 90% in bonds, which have continued to generate low but stable returns. Your retirement fund is worth just over \$500,000

Meanwhile, Jim and his wife have had to scale back their travel plans considerably, since his retirement nest egg is now worth only about \$615,000. They still have 20% more in their fund than you have in yours, but the pain they feel from the loss of more than \$550,000 will be hard to overcome.

Which biases contribute to Jim's relatively greater disappointment, given that his retirement fund is still worth more than yours?

# Life Cycle vs All Equities

## *From 1964 - 2009*



# Life Cycle vs All Equities

## *What have we learned?*

- Over the long run, equities have a much higher average annual return than bonds
- Over the short run, equities can have significant “down” years which dramatically reduce capital
- Nonetheless, if we keep our retirement funds 100% in equities, we will still do at least as well, if not better, than the recommended Life Cycle approach, even if we retire right at the end of a dramatic and extended bear market

If you were a portfolio manager, would you advise clients to utilize the “100% equities, all the time” approach?

# The Benefits of Saving Early

Suppose you open a savings account with \$1,000 when you are 20 years old. The savings account guarantees the same fixed interest rate every year. Also, each year you add another \$1,000 to the account until your 59<sup>th</sup> year. How much money will you have in the account when you are 60, assuming a 0% interest rate? What about if the interest rate is 4%? Or 8%?

Suppose instead that you wait til you are 40 years old, and then start saving. In this case, you deposit \$3,000 each year. Will this account have *more* money or *less* than in the previous savings account? Does it depend on the interest rate?

What about if you don't start saving until you are 50, but you put \$8,000 into the account each year?

*Guess how much you will have in your account when you turn 60, for these three different accounts, and three possible annual savings rates*

Fixed annual savings rate:

0%

4%

8%

1. \$1,000/yr, 40 years

\$40,000

2. \$3,000/yr, 20 years

\$60,000

3. \$8,000/yr, 10 years



# The Benefits of Saving Early

Fixed annual savings rate:

0%

4%

8%

1. \$1,000/yr, 40 years

\$40,000

\$100,000

\$280,000

2. \$3,000/yr, 20 years

\$60,000

\$100,000

\$150,000

3. \$8,000/yr, 10 years

\$80,000

\$100,000

\$125,000

- Many people are surprised that the \$1,000 per year account does so much better than the other two when the interest rate is reasonably high.
- This happens because of the miracle of *compounding*. When the rate of return is high, the *interest on interest* accumulates very quickly – much faster than we expect.

# The Benefits of Saving Early

## *Lessons Learned*

- Start your retirement account as soon as you start working
  - Because of the interest on interest, your retirement fund will be considerably higher if you start saving (even just small amounts) as early as possible
- Retirement accounts are tax deductible
  - This is a way to keep money out of the government's pocket and in your own!
- Firms often match employees' payments into retirement accounts
  - this is free money! *Why wouldn't you take as much as they will give you?!*

Given all of the benefits of saving early for retirement, why doesn't everyone do it automatically?

# The Benefits of Saving Early

## *Procrastination and Under-saving*

See the Lecture:  
Benefits of Saving  
Early

### Survey

- Mailed to a random sample of employees
- Matched to administrative data on actual savings behavior



# The Benefits of Saving Early

## *Change the Default*

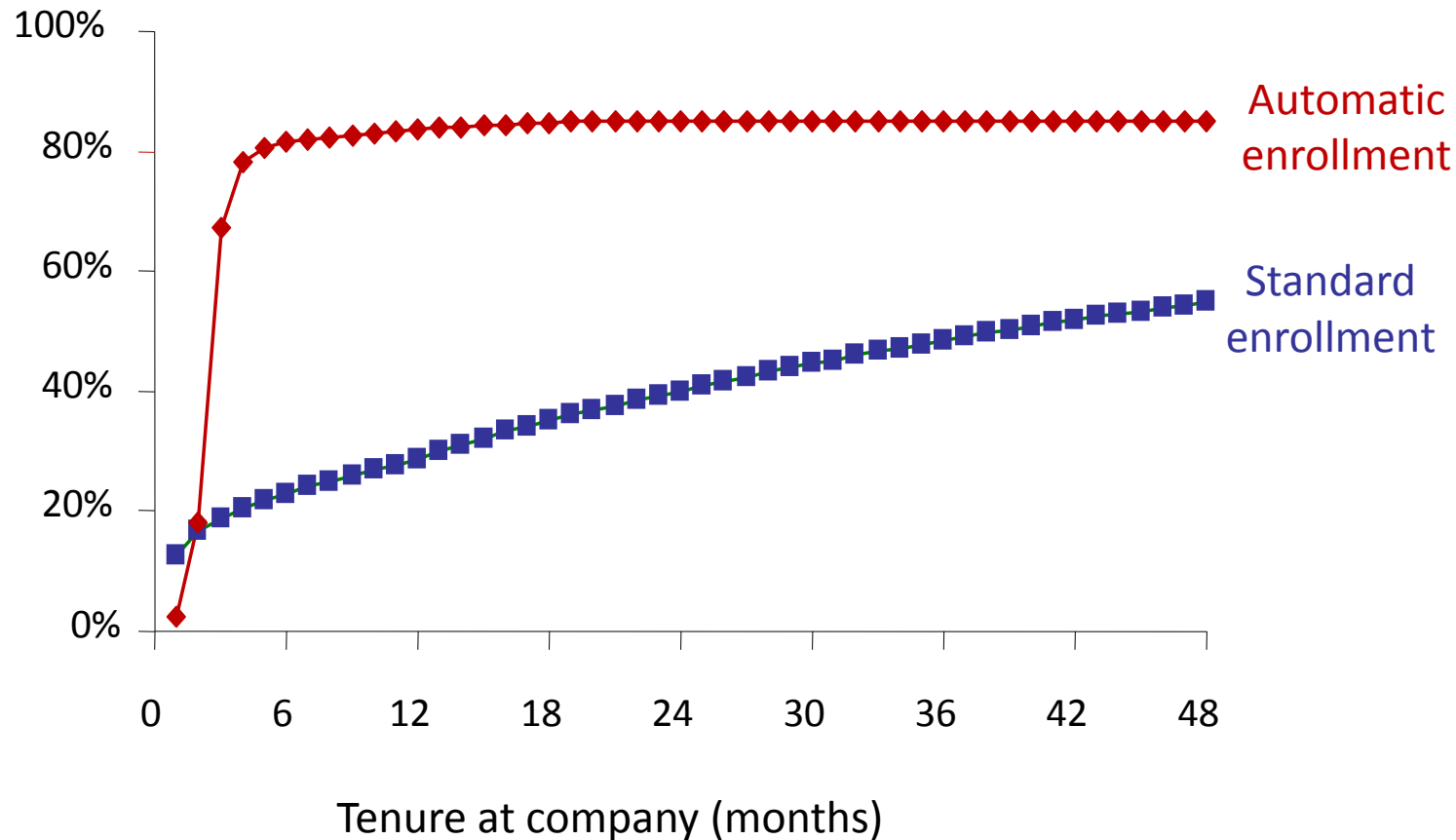
Default example:

- Welcome to the company
- If you don't do anything
  - You are automatically enrolled in the 401(k)
  - You save 2% of your pay
  - Your contributions go into a default fund
- Call this phone number to opt out of enrollment or change your investment allocations

# The Benefits of Saving Early

## *Outcome*

401(k) participation by tenure at firm



# The Benefits of Saving Early

## *Do workers like automatic enrollment?*

- In firms with standard 401(k) plans (**no auto-enrollment**), 2/3 of workers say that they should save more
- Opt-out rates under **automatic enrollment** are typically only 10% (opt-out rates rarely exceed 20%)
- Under **automatic enrollment** (and even asset mapping) HR offices report “no complaints” in 401(k) plans
- 97% of employees in auto-enrollment firms approve of **auto-enrollment**.
- Even among workers who opt out of **automatic enrollment**, approval is 79%.
- Even the US government is discussing adoption of **automatic enrollment**.

# Summary of Money Management Concepts

- Stick with *passive* rather than *actively managed* mutual funds
  - The majority of actively-managed funds underperform relative to passive, index-following funds, especially when the higher fees are taken into account
  - Funds that have outperformed historically may have done so from luck, not skill (and there is no way to determine which of these was the key driver of the fund's outperformance to date)
- Over the long run, remaining in high risk, high reward assets (like equities) will generate a larger retirement fund than the life cycle approach
  - An investor who happens to reach retirement age at the tail end of a deep and extended bear market may have to tolerate a big reduction in the value of his fund
- Start saving for retirement early, even if you can only afford to put a small amount into your retirement fund each month