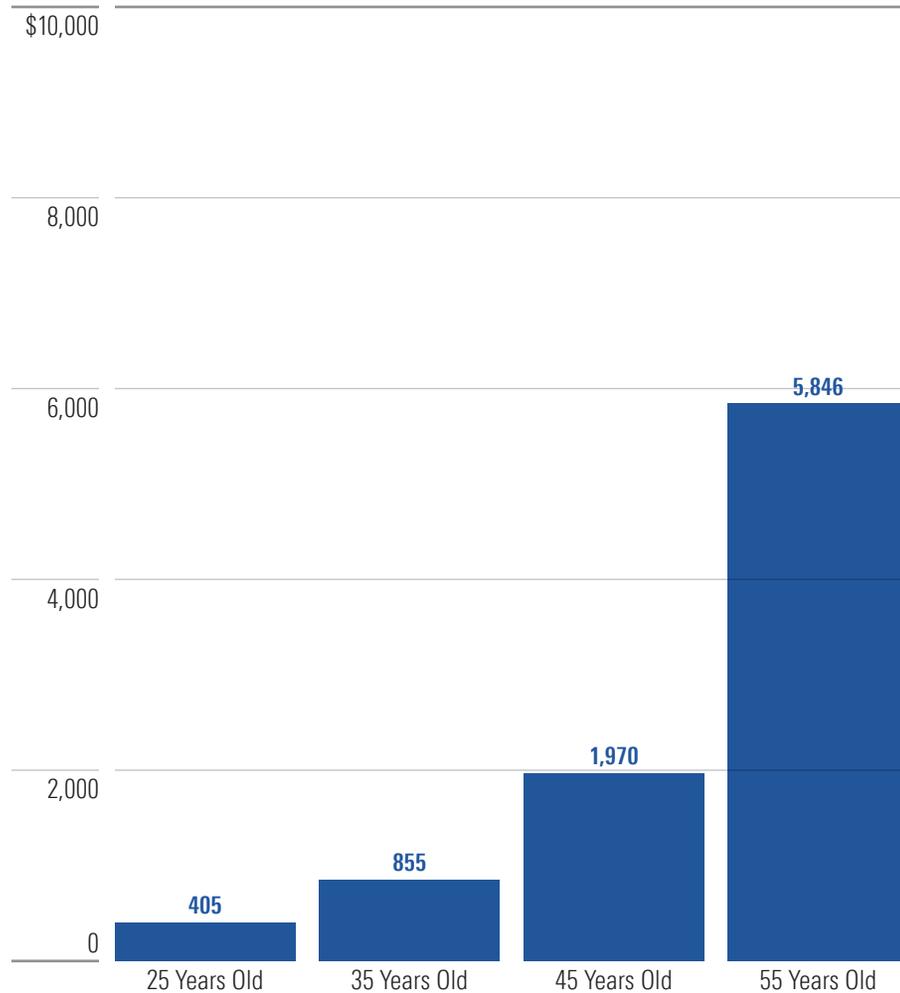


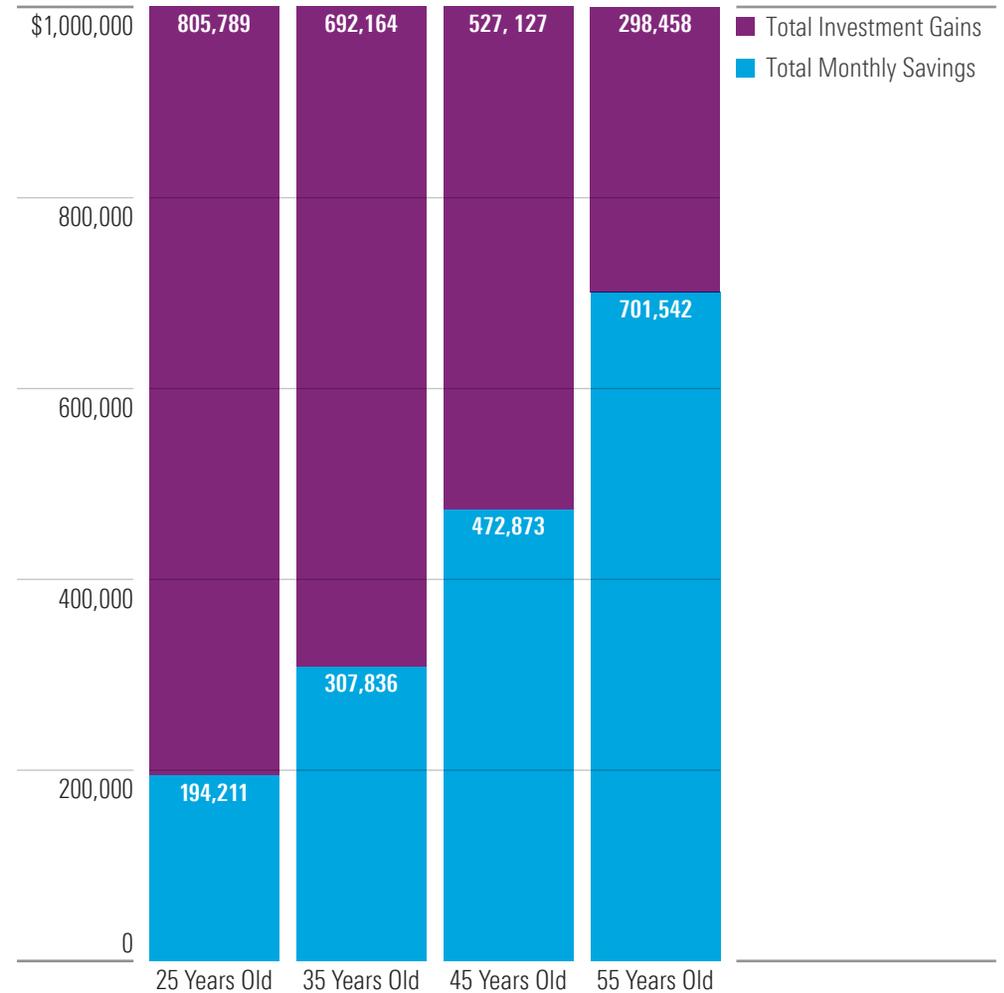
The Earlier You Start Investing, the Easier It Is to Reach Your Goals

The image represents the monthly savings necessary should the investor earn 7% per annum from a hypothetical asset. No adjustment has been made to account for inflation, fees, transaction costs, or taxes.

Monthly Savings Needed to Accumulate \$1 Million by Age 65



Contribution to Final Balance



The Earlier You Start Investing, the Easier It Is to Reach Your Goals

Extension

Part of the problem is that people have no idea how much they need to get to their goal. The 2012 Retirement Confidence Survey by the Employee Benefit Research Institute (EBRI) in the US reports that more than half (56%) of workers and/or their spouse have not tried to calculate how much money they will need to have saved by the time they retire to live comfortably in retirement.

How much does the average investor need at retirement? The answer varies for each investor. What used to be the ideal nest egg of \$1 million several years ago has probably doubled or tripled for many investors.

Once you have a sense of the amount of retirement savings necessary to support the income you need in retirement, you need to consider how much you should save each month to achieve your goal. The graph illustrates the amount of monthly savings needed to reach \$1 million by age 65 for various ages. Obviously, the earlier you start, the easier it will be to achieve your retirement savings goal due to the power of compounding investment returns.

Many people do not start to save aggressively for retirement until they reach their 40s or 50s. The good news for these investors is that they still have enough time to change their savings behaviour and achieve their goals, but they need to take action quickly and be extremely disciplined about their savings.

Keep in mind that results will vary as investing involves risk, fluctuating returns and the possibility of loss.

About the Data

The image represents the monthly savings necessary should the investor earn 7% per annum from a hypothetical asset. No adjustment has been made to account for inflation, fees, transaction costs, or taxes.

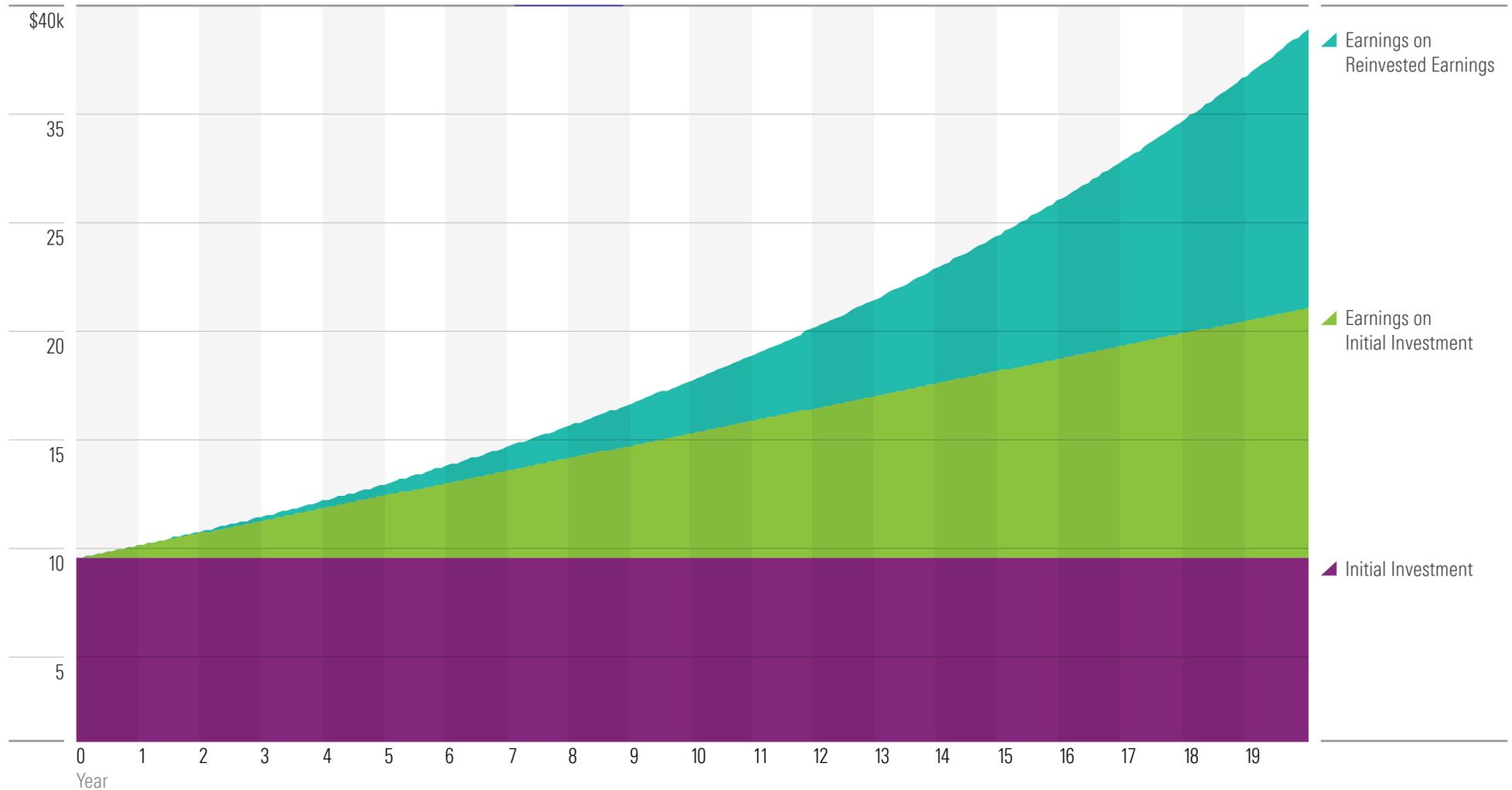
Principles

The difference in required savings cannot be simply explained by the fact that the 25 year old has more time. The full explanation is that the 25 year old has more time to earn investment returns AND more time to earn returns on their previous earnings (compounding). Note, the 25 year old's total contributions are less than one-third of those of the 55 year old.

The Power of Compounding

This chart shows the effect of compounding on an investment of \$10,000 over 20 years, paying a steady 7% pa. The purple portion represents the starting investment, while the green portion represents the total amount of money earned on that starting amount. The teal portion represents the amount of money earned on earnings (the green section) over this time.

Hypothetical Investment in Asset Paying 7% Each Year



The Power of Compounding

Extension

It's easy to procrastinate when it comes to initiating a long-term investment plan. However, the sooner you begin, the more likely it is that the plan will succeed.

This image illustrates the effects of compounding over time. It models an investor who invested \$10,000 back in 1997 in a hypothetical asset that pays 7% per annum in interest. The \$10,000 outlay grew to \$38,697 by December 2017. That final balance can be decomposed into 3 different sources. The original \$10,000, the total amount of interest that was earned on that \$10,000 each year (totalling \$13,570), and the interest that was earned on all the interest that was reinvested in the asset (\$15,127).

By reinvesting earnings, the investor was able to earn twice the amount they otherwise would have. The amount of interest earned on the interest increases over time, while the interest earned on the original investment amount (principal) stays the same. At some point the interest-on-interest is more than the interest-on-principal.

About the Data

The calculations are based on a hypothetical asset that returns a steady 7% per annum. No adjustment has been made to account for inflation, fees, transaction costs, or taxes.

Principles

The primary benefits of starting early with your investment is the value that compounding brings to your portfolio.

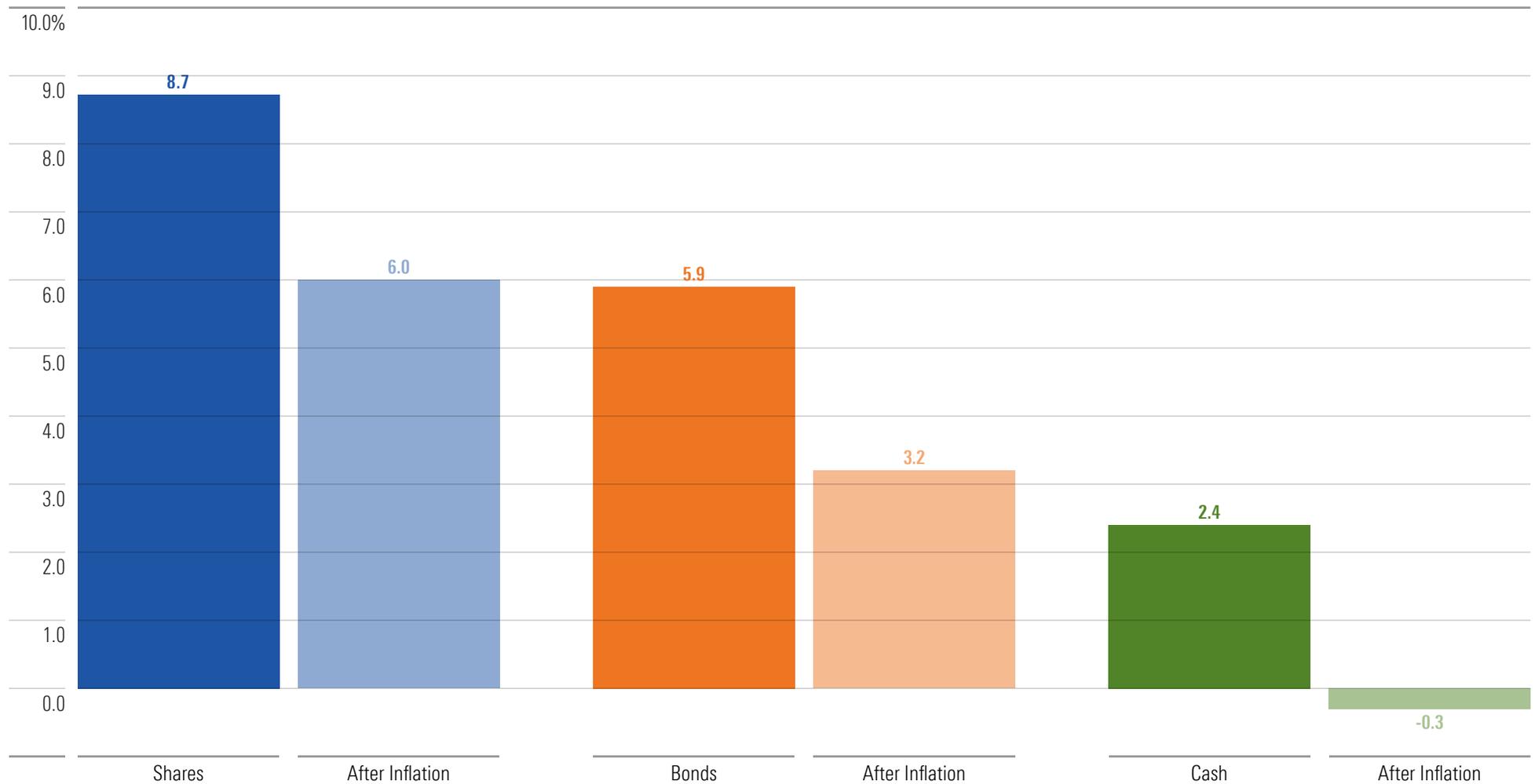
Put simply, compounding means earning money on your previous earnings.

Note that while the initial investment (red portion) remained steady and the earnings on that initial investment (orange portion) increased steadily, the earnings on the reinvested earnings is increasing at an accelerating rate.

This relies on the earnings made on the investment being reinvested as soon as they are received.

The Impact of Inflation on Investment Returns 1997–2017

This image shows the compound annual returns of three different types of investments (asset classes) over the past 20 years. The darker shaded bars are the 'nominal returns' for each asset class. That is, the increase in the value of the investment. The lighter shaded bars are the 'real returns' for each asset class. That is, the outright increase in how much the investor is able to buy with their investment.



The Impact of Inflation on Investment Returns 1997–2017

Extension

The adverse effects of inflation and taxes on investment returns become especially pronounced over the long run. Comparing the returns of different asset classes both before and after inflation and taxes is helpful in understanding why it is so important to consider inflation and taxes when making long-term investment decisions.

This image illustrates the compound annual returns of three asset classes before and after considering the effects of inflation and taxes. Over the past 20 years, inflation and taxes have dramatically reduced the returns of stocks, bonds and cash.

Of the asset classes considered, stocks are the only asset class that provided significant growth. Government and corporate bonds, after factoring in both inflation and taxes, barely provided a positive return. Term deposits, however, fared the worst, with a negative inflation-adjusted, after-tax rate of return.

If you wish to overcome the effects of inflation and taxes, you may want to consider a larger allocation to stocks.

Diversification does not eliminate the risk of investment losses. Stocks are not guaranteed and have been more volatile than other asset classes. However, government bonds and Treasury bills are guaranteed by the full faith and credit of the government as to the timely payment of principal and interest.

About the Data

After tax returns are modelled using the historical marginal tax rates for a single taxpayer earning the equivalent of \$100,000 in 2017 dollars every year. This annual income is adjusted using the Consumer Price Index to obtain the corresponding

income level for each year. Income is taxed at the appropriate rate as it occurs. After-tax returns are simulated using a set of assumptions and are provided for illustrative purposes only.

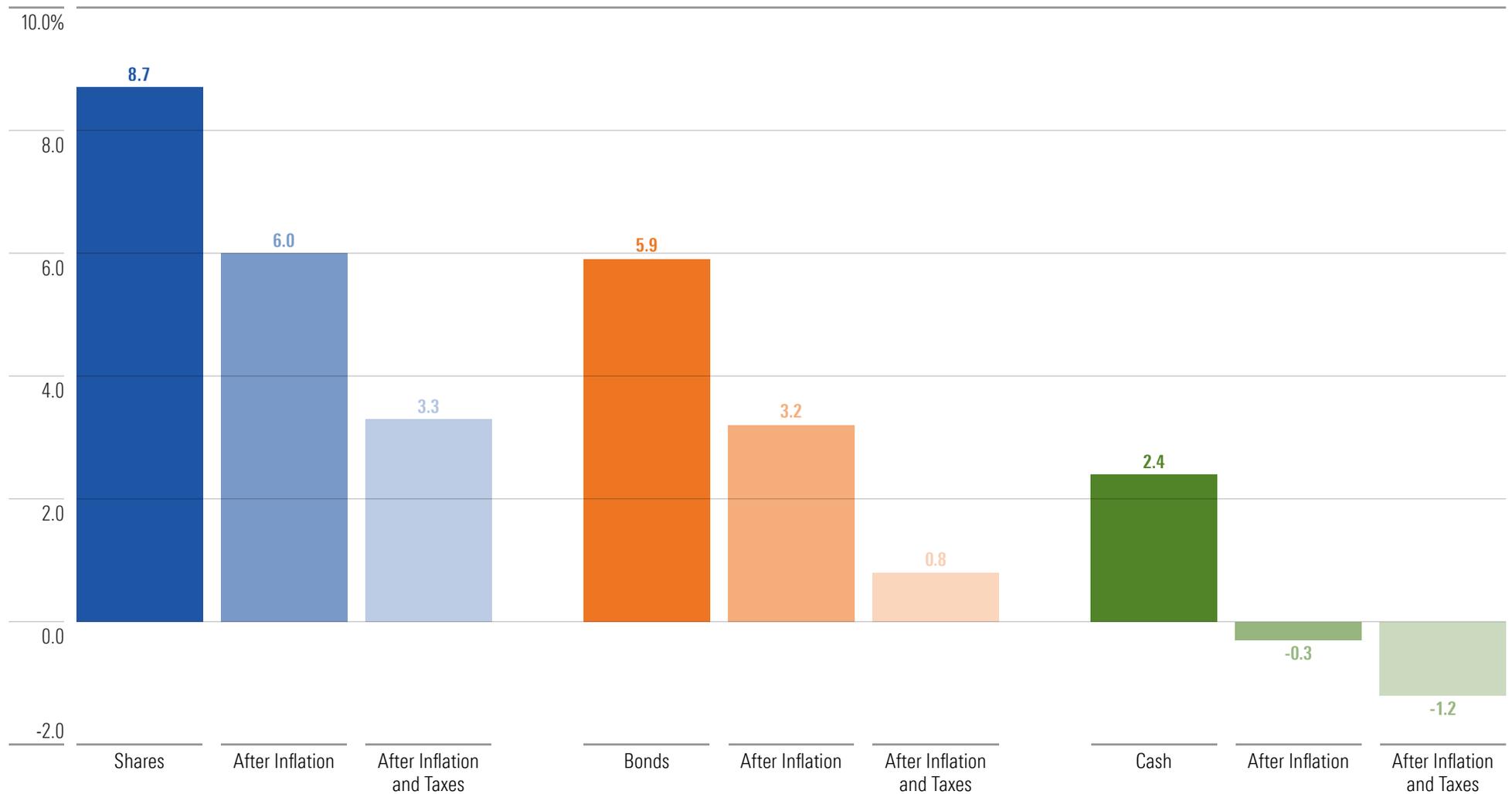
Stocks in this example are represented by the S&P/ASX 200 index, which is an unmanaged group of securities and considered to be representative of the Australian stock market in general. Bonds are represented by the Bloomberg AusBond Composite 0+Y TR AUD. Cash is represented by the cash management accounts at banks (\$10,000) series sourced from the Reserve Bank of Australia. Inflation is represented by the Consumer Price Index. An investment cannot be made directly in an index. The data assumes reinvestment of income and does not account for transaction costs.

Principles

In general, a dollar doesn't buy as much today as it did 20 years ago. This is due to the general increase in prices, otherwise known as inflation. One goal of investing is to keep pace with price increases so the money you save will at least buy as much in the future as it does today. It is important to consider inflation and taxes when looking at the return on different asset classes over the long term. Note, cash in the bank barely keeps pace with inflation and may actually lose value after tax is paid.

The Impact of Inflation and Tax on Investment Returns 1997–2017

This image shows the compound annual returns of three different types of investment (asset classes) over the past 20 years. The darker shaded bars are the 'nominal returns' for each asset class. That is, the increase in the value of the investment. The lighter shaded bars are the 'real returns' for each asset class. That is, the increase in how much the investor is able to buy with their investment. The lightest shaded bars are the 'real after-tax return' for each asset class.



The Impact of Inflation and Tax on Investment Returns 1997–2017

Extension

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Principles

In general, a dollar doesn't buy as much today as it did 20 years ago. This is due to the general increase in prices, otherwise known as inflation.

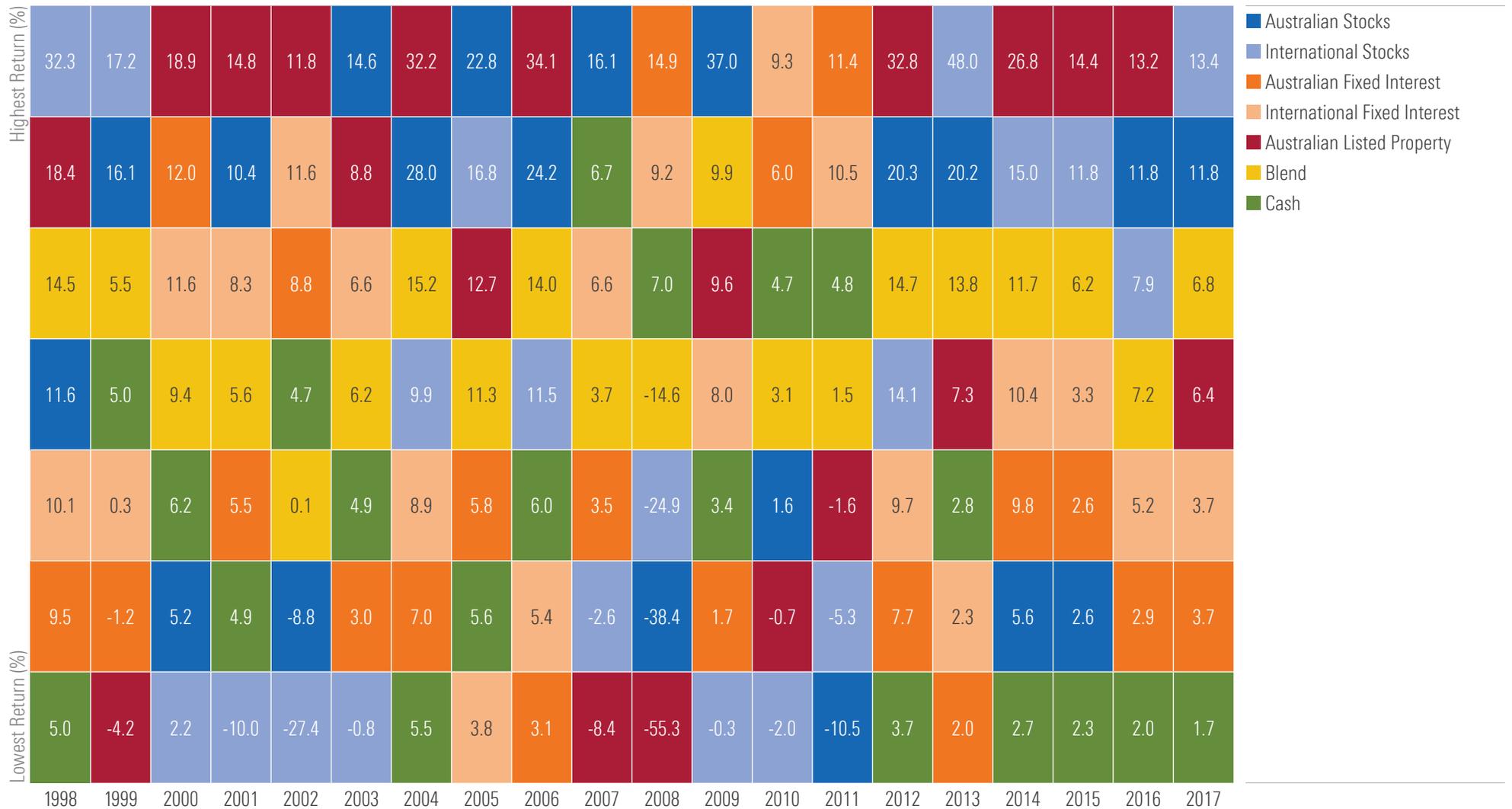
One goal of investing is to keep pace with price increases so the money you save will at least buy as much in the future as it does today.

It is important to consider inflation and taxes when looking at the return on different asset classes over the long term.

Note, cash in the bank barely keeps pace with inflation and may actually lose value after tax is paid.

Asset Classes and the Diversified Portfolio

This image displays the annual investment return for a number of different types of investment (asset classes) relative to each other over the past 20 years. It also includes the relative position of a portfolio of asset classes (called blend) over this time.



Source: Morningstar Direct.

Asset Classes and the Diversified Portfolio

Extension

This image illustrates the annual performance of various asset classes in relation to one another. In times when one asset class dominates all others, as was the case for international stocks from 1997 to 1999, it is easy to lose sight of the fact that historical data shows it is impossible to predict the winners for any given year.

Investors betting on another stellar performance for international stocks in the subsequent years were certainly disappointed, as international stocks fell to the bottom in 2000, 2001, 2002, and 2003. Similarly, Australian listed property was often a top performer from 2000 to 2006 but disastrously sank to the bottom in 2007 and 2008, posting the worst return on the chart in that year. These types of performance reversals are evident throughout this example.

Although investing in a diversified portfolio may stop an investor capturing top-performer returns in any given year, it can protect an investor from extreme losses. For example, in 2009 a diversified portfolio would have returned 9.9%, 27% lower than the top, but 10.2% higher than the bottom. Simply put, investing in a number of different asset classes may reduce portfolio volatility but diversification does not eliminate the risk of investment losses.

Government bonds and Treasury bills are guaranteed by the full faith and credit of the government as to the timely payment of principal and interest and corporate bonds are backed by the credit of corporations. Stocks are not guaranteed and have been more volatile than the other asset classes. Risk is measured by standard deviation, which measures the fluctuation of returns around the arithmetic average return of the investment. The higher the standard deviation, the greater the variability (and thus risk) of the investment returns.

About the Data

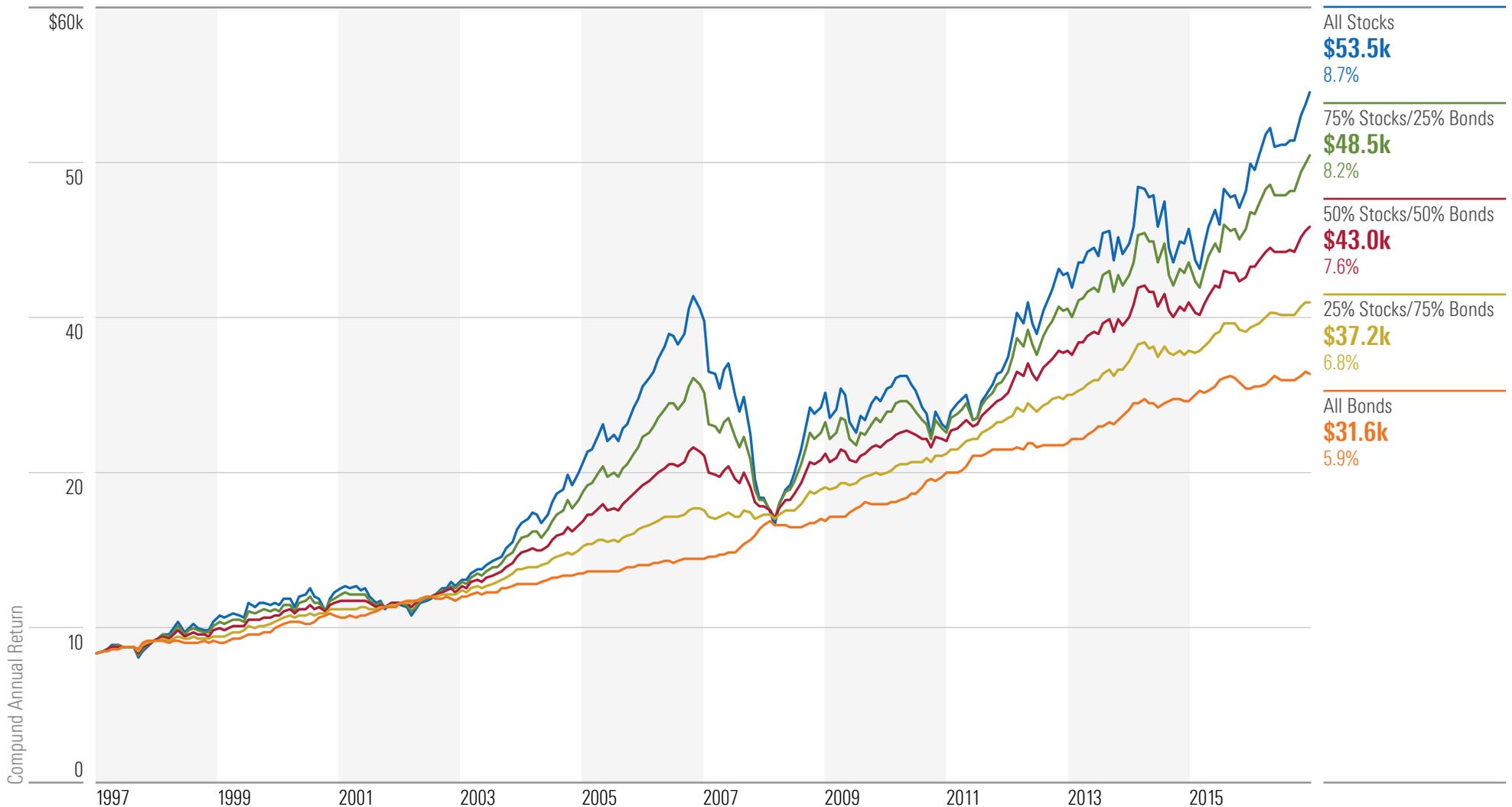
Cash is represented by the RBA Bank accepted Bills 90 Days index. Australian fixed interest is represented by the Bloomberg AusBond Composite 0+Y TR AUD. International fixed interest is represented by the Barclays Global Aggregate index, hedged into Australian dollars. Australian listed property is represented by the S&P/ASX 300 A-REIT index. Australian stocks are represented by the S&P/ASX 200 index. International stocks are represented by the MSCI World Ex Australia Net Reinvestment index in Australian dollars. An investment cannot be made directly in an index. The data assumes reinvestment of all income and does not account for taxes or transaction costs. The diversified portfolio (blend) is equally weighted between all asset classes and is meant for informational purposes only and does not reflect any recommended portfolio mix.

Principles

Different types of investments (asset classes) provide different returns at different times. Some asset classes may perform well for short periods, such as international stocks in 1997–1999 or Australian stocks in 2004–2007, but then suffer significant losses shortly after. Other asset classes, such as cash, may rarely be the best performing but are much less likely to lose money. It is difficult to consistently and accurately predict which asset classes will do the best next year, or how any specific asset class will perform in the future. A combination of investments, as represented by blend (a diversified portfolio), will contain a little bit of the bestperforming and worstperforming asset classes in any given year, but will not itself be the best- or the worstperforming investment strategy. Diversifying a portfolio can provide the benefits of a higher return and some degree of loss avoidance but does not eliminate the risk of losses.

Mixing Stocks and Bonds 1997–2017

This image shows the hypothetical performance of a set of portfolios with differing proportions of stocks and bonds over the past 20 years. The dark blue line represents the performance of a portfolio composed of only stocks, while the orange line represents the performance of a portfolio composed of only bonds. The lines in-between represent differing blends of these asset classes.



Mixing Stocks and Bonds 1997–2017

Extension

Examining the past 20 years of hypothetical portfolio returns can provide historical insight into the performance characteristics of portfolios with various stock and bond allocations. This image illustrates the hypothetical growth of a \$10,000 investment in five portfolios between 1996 and 2016.

It shows portfolios with a greater allocation to stocks generally produced greater returns and higher ending wealth values than portfolios allocated more heavily to bonds. However, the higher returns of portfolios with large allocations to stocks are associated with much greater volatility (risk).

Government bonds and Treasury bills are guaranteed by the full faith and credit of the government as to the timely payment of principal and interest and corporate bonds are backed by the credit of corporations. Stocks are not guaranteed and have been more volatile than the other asset classes.

About the Data

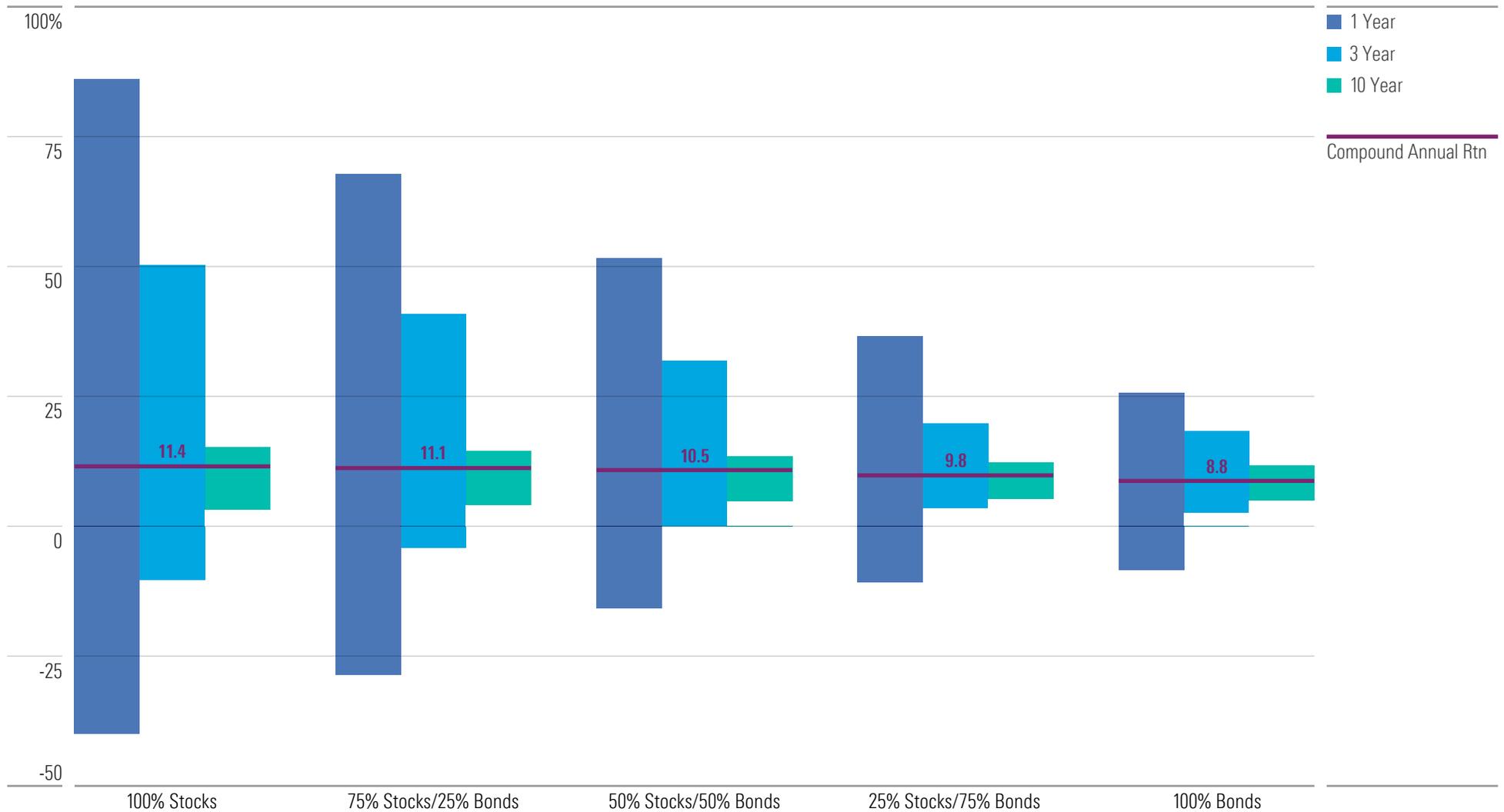
Stocks in this example are represented by the S&P/ASX 200 index, which is an unmanaged group of securities and considered to be representative of the Australian stock market in general. Bonds are represented by the Bloomberg AusBond Composite 0+Y TR AUD. An investment cannot be made directly in an index.

Principles

Investing across multiple investment types (diversifying across asset classes) can substantially alter your investing experience. Stocks may provide a greater return than bonds over the long run but are also more likely to suffer more significant losses. At times an investment weighted towards stocks can still perform worse than one weighted towards bonds, even over a long period. Diversification does not eliminate the risk of experiencing a negative investment outcome but the degree of loss can be reduced.

Portfolio Risk Changes with Composition and Time 1980–2017

This chart shows the range of returns for five portfolios with differing proportions of stocks and bonds. The bars, from darkest to lightest, show the difference between the best and worst 1-, 3- and 10-year returns over the past 37 years. The purple line shows the total compound annual return for each type of portfolio over the entire period.



Portfolio Risk Changes with Composition and Time 1980–2017

Extension

One of the main factors to consider when creating a portfolio is the amount of risk, or volatility, you are prepared to assume. However, recognise that the range of returns appears less volatile with longer holding periods.

Over the long term, periods of high returns tend to offset periods of low returns. With the passage of time, these offsetting periods result in the dispersion of returns gravitating or converging towards the average. In other words, while returns may fluctuate widely from year to year, holding the portfolio for longer periods results in an apparent decrease in volatility.

This graph illustrates the range of compound annual returns for various portfolios over 1-, 3-, and 10-year holding periods.

On a 1-year rolling basis since 1980, the returns of a 50% stock, 50% bond portfolio have ranged from a high of 51% to a low of minus 16%. For longer holding periods of 3- or 10-years, however, the picture changes. The average returns range from 32% to minus 0.2% over 3-year periods, and between 18% and 4.7% over 10-year periods. During the worst 10-year period since 1980, the portfolio still posted a positive 10-year compound annual return. However, keep in mind that holding stocks for the long term does not ensure a profitable outcome and that investing in stocks always involves risk, including the possibility of losing the entire investment.

Government bonds and Treasury bills are guaranteed by the full faith and credit of the government as to the timely payment of principal and interest and corporate bonds are backed by the credit of corporations. Stocks are not guaranteed and have been more volatile than the other asset classes. Diversification does not eliminate the risk of experiencing investment losses. Risk is measured by standard

deviation, which measures the fluctuation of returns around the arithmetic average return of the investment. The higher the standard deviation, the greater the variability (and thus risk) of the investment returns.

About the Data

Stocks in this example are represented by the S&P/ASX 200 index, which is an unmanaged group of securities and considered to be representative of the Australian stock market in general. Bonds are represented by the Australian Commonwealth Bank All Series/All Maturities Accumulation index. An investment cannot be made directly in an index. The data assumes reinvestment of all income and does not account for taxes or transaction costs.

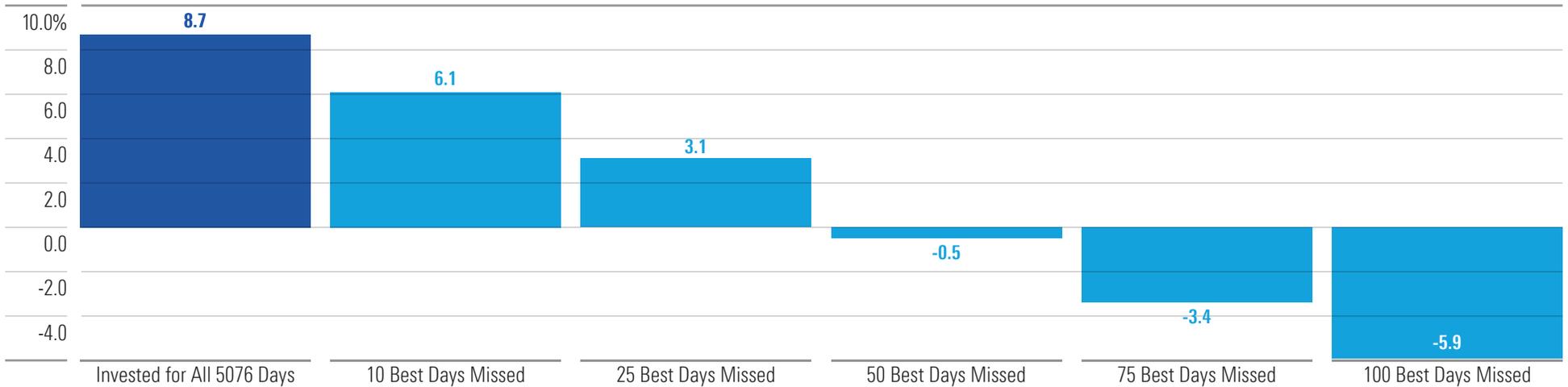
Principles

A portfolio with more stocks than bonds is likely to have much greater swings in performance than a portfolio that has more bonds than stocks. Note, the difference between the best and worst 10-year return is much smaller than the difference between the best and worst one-year return. This is because a single bad year in a decade can be offset by a good year. This is why it is useful to focus on long-term goals and returns rather than short-term changes in investment balance.

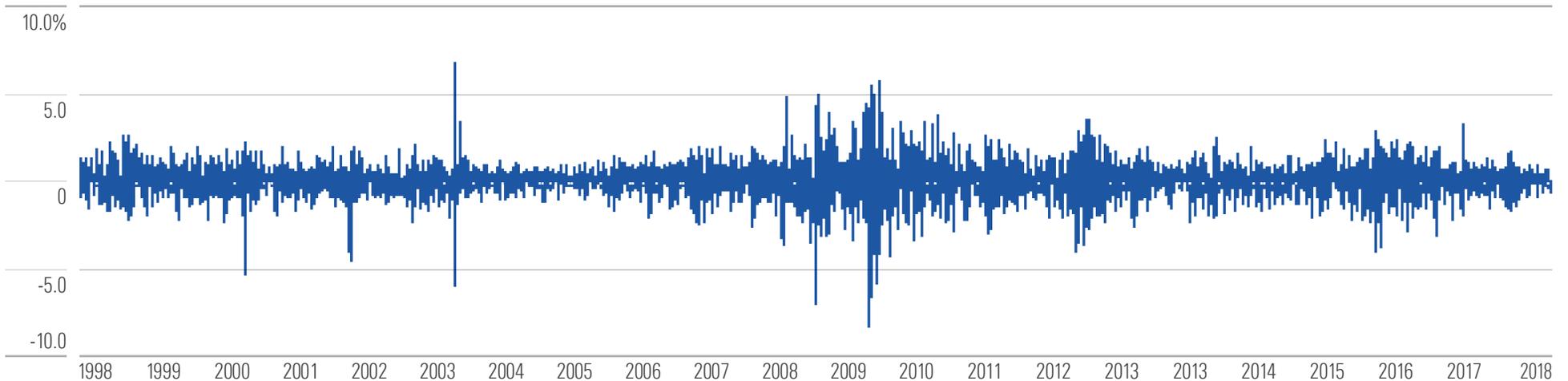
The Cost of Trying to Time the Market

The bottom chart shows the daily gains and losses in the Australian stock market since 1996. Within that “noise” are the 100 top returning days to be invested. The top chart shows the impact of being invested throughout the period compared with missing a varying number of the best investing days.

Risk of Missing the Best Days in the Market 1997–2017



Daily Gains and Losses in the Australian Stock Market



The Cost of Trying to Time the Market

Extension

Investors who attempt to time the market run the risk of missing periods of exceptional returns, leading to significant adverse effects on the value of a portfolio. This top graph illustrates the risk of attempting to time the stock market over the past 20 years by showing the returns investors would have achieved if they had missed some of the best days in the market. The bottom graph illustrates the daily returns for all trading days.

Investors who stayed in the market for all trading days achieved a compound annual return of 8.7%. However, that same investment would have returned 6.1% had it missed only the 10 best days of stock returns. Further, missing the 100 best days would have produced a loss of 5.9%. Although the market has exhibited tremendous volatility on a daily basis, over the long term, stock investors who stayed the course have been rewarded accordingly.

The appeal of market timing is obvious – improving portfolio returns by avoiding periods of poor performance. However, timing the market consistently is extremely difficult. And unsuccessful market timing, the more likely result, can lead to a significant opportunity loss.

Returns and principal invested in stocks are not guaranteed. Holding a portfolio of securities for the long-term does not ensure a profitable outcome and investing in securities always involves risk of loss.

About the Data

Stocks in this example are represented by the S&P/ASX 200 index, which is an unmanaged group of securities and considered to be representative of the Australian stock market in general. An investment cannot be made directly in an index. The

data assumes reinvestment of income and does not account for taxes or transaction costs.

Principles

It is very tempting to believe that you can enhance your investment returns by jumping in and out of the market at the right times.

This belief is emboldened by looking at previous market booms and busts and re-assessing them as predictable in advance. (This is known as hindsight bias.)

In reality, the ability to consistently and accurately predict the best times to buy into or sell out of the market is a very valuable skill, but not one many (if any) people possess.

The benefits of successfully “timing the market” can be immense, but must be considered alongside the potential downside, being out of the market at the wrong time.

As the top chart shows, there were more than 5,000 investing days over those 20 years and missing just the top 1% of them would turn a 9% gain into an 0.5% loss, missing the top 2% would result in a substantial loss.

The Importance of Staying Invested

The image shows three different reactions to a recent investment loss. The dark blue line shows the experience of an investor who stayed invested in stocks. The green line shows the experience of an investor who exited the stock market and invested in cash. And the light blue line shows the experience of the investor who exited the market at the bottom but then reinvested in stocks a short time (12 months) later.

Ending Wealth Values After a Market Decline



The Importance of Staying Invested

Extension

Investors who attempt to time the market run the risk of missing periods of exceptional returns, leading to significant adverse effects on the ending value of a portfolio.

The image illustrates the value of a \$10,000 investment in the stock market during the period October 2007– December 2017, which included both the global financial crisis and the recovery that followed. The value of the investment dropped to \$5,282 by February 2009 (the trough date), following a severe market decline.

If an investor had remained invested in the stock market over the next 59 months, however, the ending value of the investment would have been \$14,177. If the same investor exited the market at the bottom to invest in cash for a year and then reinvest in the market, the ending value of the investment would have been \$10,136. An allcash investment at the bottom of the market would have yielded only \$6,925. The continuous stock market investment recovered its initial value over the next five years and provided a higher ending value than the other two strategies.

While recoveries may not all yield the same results, investors are well advised to stick with a long-term approach to investing.

Returns and principal invested in stocks are not guaranteed. Stocks have been more volatile than bonds or cash. Holding a portfolio of securities for the long term does not ensure a profitable outcome and investing in securities always involves risk of loss.

About the Data

The market is represented by the S&P/ASX 200 index, which is an unmanaged group of securities and considered to be representative of the Australian stock market in general. Cash is represented by the UBS Bank 0+ Years index. An investment cannot be made directly in an index. The data assumes reinvestment of income and does not account for taxes or transaction costs.

Principles

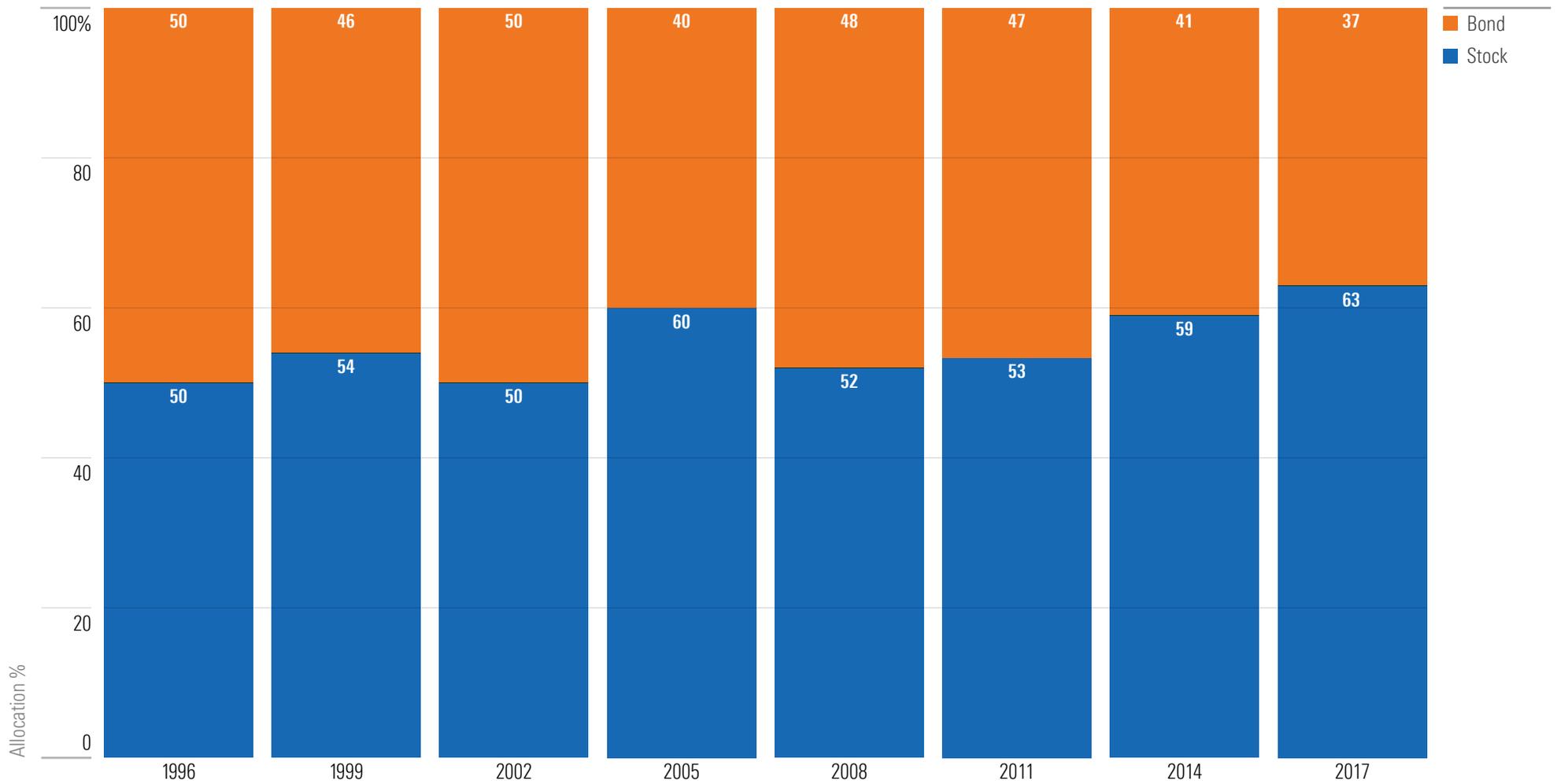
It is natural to have an emotional reaction to changes in fortune.

However, acting on that natural emotion can end up making things worse; investors may leave the market and miss out on the subsequent recoveries.

An investor who exited the market at the bottom, waited for a year, and then reinvested would have missed out on fully half the recovery in stock prices.

The Importance of Rebalancing 1996–2017

The image shows how a portfolio (containing an equal amount of both stocks and bonds) can naturally change composition over time as the two types of investments (asset classes) perform differently.



The Importance of Rebalancing 1996–2017

Extension

Because asset classes grow at different rates of return, it is necessary to periodically rebalance a portfolio to maintain a target asset mix. This image illustrates the effect of different growth rates on a static (unbalanced) portfolio over a 21-year period. At year-end 1996, the target asset mix began with a 50% allocation to stocks and a 50% allocation to bonds.

The proportion of stocks in the portfolio grew from 1996 to 1998, when it accounted for 54% of the portfolio. After a period of stability, market fluctuations caused the stock allocation to surge to 60% by 2005, before easing to 53% by 2011. This allocation is drastically different from the 50%/50% portfolio the investor started out with.

Asset classes associated with high degrees of risk tend to have higher rates of return than less volatile asset classes. For this reason, a portfolio that is not rebalanced periodically will usually become more volatile (riskier) over time than less volatile.

About the Data

Stocks are represented by the S&P/ASX 200 index, which is an unmanaged group of securities and considered to be representative of the Australian stock market in general. Bonds are represented by the Bloomberg AusBond Composite 0+Y TR AUD. This index tracks a combination of Australian corporate and government bonds. An investment cannot be made directly in an index. The data assumes reinvestment of income and does not account for taxes or transaction costs.

Principles

The riskiness of a portfolio changes when the proportion of different type of securities (asset classes) changes.

This proportion can change naturally as some asset classes perform better than others.

This means that every now and then it is important to check on the composition of the portfolio and bring it back to what you intended. This is called rebalancing.

In the image, the portfolio initially had equal amounts of stocks and bonds, but by 2006 the proportion of stocks in the portfolio increased by almost a third, making the portfolio much more risky than initially intended.

Incidentally, shortly after 2007 stocks suffered one of their worst downturns in decades. This meant that the (un-rebalanced) 2006 portfolio in the example would have incurred greater losses (-25.9%) than the original, equally-weighted portfolio (-19.3%) in 2008.