# METHODOLOGY

# College Planning (the "Tool")

**Overview**

The primary objective of the Tool is to provide you with education about your current savings, estimated future contributions, and the potential impact they may have on your college savings goal. Each Tool session is a one-time, nondiscretionary service, which means that it is up to you to implement your planning strategy if, and as, you choose. We suggest that you revisit the Tool periodically and, in particular, when your financial circumstances change. Please consult your tax advisor or investment professional, if applicable.

**IMPORTANT: The projections or other information generated by the Tool regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. Results may vary with each use and over time.**

**Limitations of the Tool**
The Tool does not make predictions of future market conditions or attempt to provide predictions as to the actual market performance of the specific investments or holdings in your selected accounts. Instead, the Tool uses historical returns (based primarily on index performance rather than on the performance of any one security), market volatility data, and correlation characteristics (i.e., standard deviation) to estimate potential income in retirement. Past performance is no guarantee of future results. Also, it is not possible to invest directly in an index. Performance returns for actual investments will generally be reduced by fees and expenses not reflected in the hypothetical illustrations.

All calculations and results are purely hypothetical in nature and will not affect your actual accounts. You are responsible for your own investment and planning decisions, and you may accept, reject, or modify any results obtained through the Tool.

Fidelity may incorporate certain personal or financial information into the Tool which you have previously provided to Fidelity or its affiliates. You should verify the continued accuracy of any such information.

Keep in mind that the illustrations reflected in the Tool are current as of the date provided, based in part on data obtained from multiple sources, including third-party sources. Any results provided are based on certain quotes and other pricing data that the Tool obtains from Fidelity and third parties on a periodic basis. Results are also based on the value of your accounts. Because these values change over time, your results may change if you use the Tool more than once.

**College costs**

Four-year regional college costs for *Public - In State and Public - Out of State and Private - Average* colleges are estimated using data provided by The College Board. Estimates for *Private - Expensive* costs are based on the average four-year cost of the top 10% most expensive colleges by region according to Peterson's College Costs. School specific costs are determined by the US department of Education College Scorecard(https://collegescorecard.ed.gov/data).
Reasonable efforts are made to use the most current data available. Manually entered costs can also be entered.


+ States included in the regions are as follows: Mid-Atlantic: DC, DE, MD, NJ, NY, and PA; Midwest: IA, IL, IN, KS, MI, MN, MO, NE, ND, OH, SD, WI, and WV; New England: CT, MA, ME, NH, RI, and VT; South: AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, and VA; Southwest: AZ, NM, OK, and TX; West: AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, and WY

The Tool assumes the cost of college, including manually entered costs, is growing at a nominal rate (a rate which is not adjusted for inflation) of 5% each year, based on internal Fidelity analysis of the growth in college costs. The total cost of college estimated in the Tool is the cost to cover 4 years of attendance. To calculate the total cost, the entered cost for one year of college is inflated at a rate of 5% per year through the estimated completion of four years of college. The total cost for four years is then presented in today's dollars (discounted by the Tool's general inflation rate).

**College start date**

For purposes of the College Goal, college is assumed to start in the year in which the individual turns the age provided as the college start age, typically age 18. The tool uses the individual's date of birth and college start age in order to determine the college start year. If the individual is at or older than the college start age, then college is assumed to start the next year and the length of college is not adjusted downward but remains a 4-year period of attendance.

Example: DOB 4/29/2008; College Start Age = 18 then College Starts in 2026

# Calculations and Results

**Financial Planning Engine**
The Tool uses a Monte Carlo simulation-based approach to illustrate through numerical and graphical displays the potential growth of your account balances, relying on certain market performance assumptions. The analysis is based on historical market data to estimate a range of potential outcomes for various hypothetical portfolios under different market conditions. Monte Carlo simulations are mathematical methods used to estimate the likelihood of a particular outcome based on market performance historical analysis. The Tool uses information derived from the Monte Carlo approach, in which markets are assumed to change. While over very long periods of time, markets have averages, it is often the case that the market performs both above and below these averages. The Monte Carlo simulations are designed to reflect this historical market volatility.

**Historical Performance Analysis**
The historical performance analysis is performed in several steps. First, asset class percentages of an asset mix used for modeling purposes are identified. The asset allocation or asset mix for each account assigned to your goal is determined by sorting the holdings in the account among several major asset classes, including domestic stocks and foreign stocks, bonds, short-term securities (cash, cash equivalents, CDs, money market funds, etc.), Other, and Unknown.
Underlying investments held in a mutual fund or other pooled investment vehicle are considered individually. If holdings data is not available to Fidelity, the interest is categorized as "Unknown," which can include assets held in newly launched mutual funds. The "Other" category includes non-asset class holdings (i.e., identified holdings which cannot be categorized as domestic stocks, foreign stocks, bonds or short-term investments). Assets classified as Unknown or Other are normalized to reflect the account's current allocation to domestic stocks, foreign stocks, bonds, and short-term categories and then reflected in those asset class percentages for purposes of determining the account's overall asset allocation. Significant weighting categorized as Other or Unknown, short positions in selected accounts, as well as margin balances at the time of the interaction, may materially impact the analytical information presented during this interaction and render the analysis unreliable.

Once the asset allocation for each account assigned to your goal is determined, the goal level asset allocation is calculated by asset weighting the asset mix for each account. The resulting goal level asset class percentages are used by the Tool for modeling purposes.

| Asset Mix Description | Domestic Stock | Foreign Stock | Bonds | Short-Term |
|---|---|---|---|---|
| **Short Term**<br>This type of asset mix may be appropriate for investors who want to preserve their capital and can accept the lowest returns in exchange for price stability | 0% | 0% | 0% | 100% |
| **Conservative**<br>This type of asset mix may be appropriate for investors who want to minimize fluctuations in market values by taking an income-oriented approach with some potential for capital appreciation. | 14% | 6% | 50% | 30% |
| **Moderate with Income**<br>This type of asset mix may be appropriate for investors who seek income and the potential for capital appreciation, with a slight priority on income, and who can withstand moderate fluctuations in market values | 21% | 9% | 50% | 20% |
| **Moderate**<br>This type of asset mix may be appropriate for investors who seek income and the potential for capital appreciation, with a slight priority on capital appreciation, and who can withstand moderate fluctuations in market values. | 28% | 12% | 45% | 15% |
| **Balanced**<br>This type of asset mix may be appropriate for investors who want the potential for capital appreciation and some growth, and who can withstand moderate fluctuations in market values. | 35% | 15% | 40% | 10% |
| **Growth with Income**<br>This type of asset mix may be appropriate for investors who seek moderate growth and income, and who can withstand moderate fluctuations in market values. | 42% | 18% | 35% | 5% |
| **Growth**<br>This type of asset mix may be appropriate for investors who seek growth, and who can withstand significant fluctuations in market value. | 49% | 21% | 25% | 5% |
| **Aggressive Growth**<br>This type of asset mix may be appropriate for investors who seek aggressive growth and who can tolerate very wide fluctuations in market values. | 60% | 25% | 15% | 0% |
| **Most Aggressive**<br>This type of asset mix may be appropriate for investors who seek very aggressive growth and can tolerate very wide fluctuations in market values | 70% | 30% | 0% | 0% |

To determine your goal level asset allocation, we've made the following assumptions about the asset mix of any accounts assigned to this goal:

- Fidelity accounts and non-Fidelity accounts that you've added using FullView will remain invested according to the asset mix of these accounts at the time of your analysis.
- Checking and savings accounts will remain 100% in short-term investments
- Non-Fidelity accounts for which we have no asset mix will remain invested in a hypothetical asset mix of a Balanced asset allocation.
- Please note due to rounding, it may not always equal to a 100%

Then, using the expected returns for each asset class (i.e., domestic stocks, foreign stocks, bonds, and short-term investments) and their historical correlations and volatilities derived from running a minimum of 250 hypothetical financial market return scenarios or simulations, the Tool estimates the performance of that asset mix to create a range of potential returns. The expected returns for the asset classes are based on historical returns. Finally, the Tool graphs results of the analysis based on how that asset mix may have performed in a certain percentage of the simulated market scenarios. These percentages are called "confidence levels." For example, the default confidence level is 75%, which we consider "conservative" market performance. This means that in 75% of the historical market scenarios run, an asset mix similar to the asset mix used for modelling purposes performed at least as well as the results shown. Conversely, in only 25% of the historical market scenarios run, the asset mix used for modelling failed to reach the results shown. Your results will be available for viewing at the 50%, 75% and 90% confidence levels.

Average annual returns are hypothetical, and, if achieved annually, would produce the same cumulative total return as if performance had been constant over the entire period. Average annual total returns simply smooth out variation in performance; they are not the same as actual year-by-year results. There is historical risk associated with market declines.

Historical returns and volatility of the domestic stocks, foreign stock, bond, and short-term asset classes are based on Morningstar historical performance data from 1926 on and reviewed annually.[1]
- Domestic equities are represented by the S&P 500® Index from the year 1926 through 1986 and the Dow Jones U.S. Total Market Index[SM] from 1987 on. [2]
- Foreign equities are represented by the S&P 500® Index from 1926 through 1969, the MSCI EAFE Index from 1970 through 2000, and the MSCI ACWI Ex USA Index from 2001 on. [3,4]
- Bonds are represented by U.S. intermediate -term bonds from 1926 through 1975 and the Bloomberg Barclays U.S. Aggregate Bond Index from 1976 on.[5]
- Short-term investments are represented by 30 day U.S. Treasury bill rates from 1926 on.

*1 Morningstar, Inc., is an independent provider of financial information. Morningstar*

*does not endorse any broker-dealer, financial planner, insurance company, or mutual fund company.*

*2 The S&P 500® Index is an unmanaged market capitalization–weighted index of common stocks. S&P 500® is a registered service mark of Standard & Poor's Financial Services LLC. Dow Jones U.S. Total Market Index℠ is an unmanaged market capitalization–weighted index of more than 5,000 U.S. equity securities that contains all actively traded common stocks with readily available price data.*

*3 The MSCI EAFE Index is an unmanaged market capitalization-weighted index of common stocks across developed markets, excluding the USA and Canada.*

*4 MSCI ACWI Ex USA Index is an unmanaged market capitalization-weighted index of common stocks across developed markets, excluding the USA.*

*5 Bloomberg Barclays U.S. Aggregate Bond Index is an unmanaged market capitalization–weighted index of U.S. dollar–denominated investment-grade fixed-rate debt issues, including government, corporate, asset-backed, and mortgage-backed securities with maturities.*

*of at least one year.*

Although past performance does not guarantee future results, it may be useful in comparing alternate investment strategies over the long term. Performance returns for actual investments will generally be reduced by fees and expenses not reflected in these hypothetical illustrations. Indexes are unmanaged, and it is not possible to invest directly in an index.

Investment taxes are applied to the growth of college savings according to the following rules:
- 529 plan accounts are assumed to grow tax-deferred
- Brokerage accounts are assumed to turnover 10% of all assets, pro-rata, so that each year 10% of previously unrealized gains or losses become realized. The dividend component of assumed returns is 2% and is taxed as qualified income at a rate of 15%. Interest and compensation income, including equity compensation is taxed at a rate of 25%.
- Fees are not factored into the analysis
- UGMA/UTMA accounts are assigned a flat tax based on years of accumulation growth. The tax rate applied is based on Fidelity analysis comparing the difference between the growth of a tax-free account versus an account with the characteristics of an UGMA/UTMA. This estimated flat tax is based on averages, and actual tax handling may differ.

| Years to College | Tax |
|---|---|
| 17+ | 6.80% |
| 16 | 6.40% |
| 15 | 6.00% |
| 14 | 5.60% |
| 13 | 5.20% |
| 12 | 4.80% |
| 11 | 4.40% |
| 10 | 4.00% |
| 9 | 3.60% |
| 8 | 3.20% |
| 7 | 2.80% |
| 6 | 2.40% |
| 5 | 2.00% |
| 4 | 1.60% |
| 3 | 1.20% |
| 2 | 0.80% |
| 1 | 0.40% |
| 0 | 0.00% |

**Current Savings**

The current savings amount includes any accounts assigned to this goal or an estimate of any savings you've provided. This amount represents the starting point for your account balances in the financial projections.

Unsettled Transactions, Margin Balances, and Short Positions
NOTICE: Unsettled transactions, margin balances, and short positions affect account balances, holdings data, and analytical information presented. Please consult your account statement and any statements from the respective financial institution for accounts included in the Tool. Unsettled transactions pending in any of your selected accounts, margin balances, and short positions at the time of your Tool interaction may materially impact the value of that account included in your analysis. For an unsettled equity purchase, the value may be materially overstated (and the investment risk understated due to cash remaining in the account), and for an unsettled equity sale, the value may be materially understated (and the investment risk overstated). Depending on the size and scope of such balances or transactions, you may want to exclude the affected account(s) from your analysis or, if included, consider the reliability of the Tool's results.

**Full View® Accounts**

A Full View® account (if this service is available to you) is an online account held at another institution from which you have authorized Fidelity to import your account data

electronically. The Full View service is provided by Fidelity for your convenience. Fidelity controls which account types offered by the Full View service will be used with the Tool. The supported types may change over time. Fidelity is not responsible for the validity, legality, copyright compliance, or appropriateness of content gathered by the Full View service. Fidelity does not prepare, edit, endorse, or warrant, and makes no representations concerning, the accuracy, timeliness, or completeness of information and data collected from third-party sources. Fidelity does not audit, confirm, or verify the information you provide or the information that you permit to be obtained through Full View. You are responsible for checking and updating this information for accuracy, timeliness, and completeness. Balances of accounts aggregated using Full View represent the most recent update and may not be timely or accurate if an update was not successfully completed or the information obtained during the refresh from the institution is otherwise not accurate or current. The "refresh" date may not be the same as the "as of" date, which is available directly through the financial institutions.

**Equity Compensation Accounts**
The Tool can illustrate various types of equity compensation awards that may be included as part of a user's plan. The equity compensation awards supported generally include option awards (Incentive Stock Options, Non-Qualified Stock Options and Stock Appreciation Rights) and share awards (Restricted Share Awards, Restricted Share Units and Performance Share Units). The Tool does not currently support qualifying disposition of Incentive Stock Options or Internal Revenue Code (IRC) Section 83(b) elections on Restricted Share Awards. Users planning a qualifying disposition, or an IRC Section 83(b) election should consider the impact of such decisions on the results presented. All projected, hypothetical income generated from equity compensation awards is treated as wage income and taxed upon receipt in accordance with the tax treatment of other income sources.

The Tool does not consider these assets as a potential income source until an "income event" occurs. An "income event "occurs at the time the underlying equity award of shares is sold. This sale is assumed to take place simultaneously with the exercise of an option or the vesting of shares. At the time of the income event, the proceeds (if any) from the sale of the shares associated with the exercise of an option or as shares vested are treated as income to the plan and then become available to pay expenses. If this income is not immediately used to pay expenses, it is assumed to be invested consistent with the goal-level asset allocation of the overall plan. Options are exercised (and underlying shares assumed to be sold) on each vesting date; the hypothetical income which flows to the plan is equal to the in the money value given the simulated underlying security price and the provided strike/grant price (i.e., a cashless exercise is assumed). Share awards vest (and are simultaneously assumed to be sold) according to the provided vesting schedule and income flows to the plan with each vesting period. Any expenses which may be incurred in connection with the sale of the underlying security are not considered by the Tool.

In order to project the potential value of the income source at the time of an income event, the Tool uses Monte Carlo analysis to simulate the potential values of the underlying security upon which these equity compensation awards derive their value. To accomplish this, the Tool considers the current market price of the security, the volatility of the stock

based on the previous year of returns, and the trailing 12-month dividend yield. Given the security specific volatility, a stream of 250 random total annual returns are generated; the dividend yield is then subtracted from these annual returns to arrive at the price return which drives the price appreciation of the underlying security from which the equity compensation values are derived. If the volatility or dividend rate is unavailable, market average defaults are used. From here, the price of the underlying security can be projected and compared against the facts of the equity compensation in order to determine the actual income flow, if any, at the time of the anticipated sale.

**Manually Entered/Other Accounts**

The Tool will display accounts and other income sources you have manually entered during a previous planning Tool interaction, and also allows you to manually add an account or other income source, and, as appropriate, assign the account to your retirement income goal, provide general asset allocation information, assign a balance or market value (as appropriate) to the account or other income source, and include it in your analysis. Note that manually added account balances do not automatically update. You should review these balances with each Tool use to ensure that the most up-to date values and information are used in your analysis.

**Updating Account Data**

In the Tool, market values, account balances, and account positions for employer-sponsored workplace savings plans [e.g., 401(k), 403(b), and 457(b) plans] and personal investing accounts you hold at Fidelity will be automatically updated. Non-Fidelity accounts that are aggregated using Full View (if you have this service available to you) will also be automatically updated in accordance with the terms of that service. You are responsible for updating the data for any other accounts or income sources.

**Other Ways to Pay**

The "Other Ways to Pay" section allows for the entry of additional sources of assets or income that you expect will contribute to the payment of college expenses. The amounts entered in these fields are the lump sum amounts available from these sources to fund expenses at the start of college. These amounts are not taxed and no investment growth is applied to them. The amounts are entered in today's dollars. If the expected additional income provided from Other Ways to Pay exceeds the expense amount in a given year the excess amount is saved and invested according to the goal asset allocation.

**Limitations of Historical Performance Analysis**
Historical performance analysis figures do not represent the actual or hypothetical performance of your actual holdings. This assumes broad diversification within each asset class as represented by certain indexes. it makes no attempt to model one's actual holdings. Thus, results may be quite skewed if someone has a considerable amount of idiosyncratic security- specific risk.

**Monte Carlo Simulations**
Monte Carlo simulations are mathematical methods used to estimate the likelihood of a particular outcome based on market performance historical analysis. The Monte Carlo approach has been around since the early 1900s and is used across many fields, such as physics, chemistry, and biotechnology to solve complex science problems, particularly those that fall into a nonlinear category. Historical performance simulations are conducted to determine the probability that a portfolio may experience a certain minimum level of performance given market volatility. Monte Carlo simulations are analogous to rolling several pairs of dice. Each Monte Carlo simulation reproduces a random set of results by generating a random return for the scenario. When analyzed together, these results suggest a probability of occurrence.

For example, if you repeatedly roll four dice at the same time, the probability of all sixes coming up in the same roll is very low; however, other results may be more probabilistic, such as one six occurring in any given roll. For the purposes of our Monte Carlo simulations, we randomly generate a series of hundreds of returns for a given scenario. Together, these scenarios provide a probability that a certain amount (or greater) of assets/income occurs at that level. These simulations are generated by Strategic Adviser's Financial Planning engine and are used by the Tool.

**Assumptions in Monte Carlo**
Random variables, representing asset class returns, are drawn from a specific statistical distribution. The time increment used in the Monte Carlo simulations is one year. Annual randomly generated returns are required to simulate the mean, standard deviation, distribution, and correlated behavior of the observed historical asset class.

Annual returns assume the reinvestment of interest income and dividends, no transaction costs, no management or servicing fees, and the rebalancing of the portfolio every year. The calculation does not include annual returns of individual securities you hold; instead, the analysis is performed on asset classes, not individual securities. All investments within an asset class are treated the same for historical performance purposes subject to the limitations described above. it is not possible to invest directly in an index. All indexes include reinvestment of dividends and interest income.

**Asset Allocation of Certain Proceeds and/or Income Assumed Risk and Return**
A Monte Carlo simulation of capital market returns takes into account expected returns from each asset class (i.e., domestic stocks, foreign stocks, bonds, and short-term investments), their volatility, correlations between them, and other factors, all based on historical statistics. Random rates of return are generated by sampling values from a probability distribution such as a bell curve (i.e., "lognormal" distribution). Returns from stock asset classes (such as domestic and foreign equities) are historically higher than returns from lower-risk (such as fixed income or short-term). But higher stock returns also have greater risk associated with a wider range of outcomes-from complete loss of

capital to appreciation many times over the initial purchase price. And they also experience greater volatility. Asset classes, when considered within a framework of historical performance conditions, have a clear correlation with each other and are not considered independently. These mathematical relationships can be quantified and fit in the model.

Generally, among asset classes stocks are more volatile than bonds or short-term instruments and can decline significantly in response to adverse issuer, political, regulatory, market, or economic developments. Although the bond market is also volatile, lower-quality debt securities including leveraged loans generally offer higher yields compared to investment grade securities, but also involve greater risk of default or price changes. Foreign markets can be more volatile than U.S. markets due to increased risks of adverse issuer, political, market or economic developments, all of which are magnified in emerging markets.

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