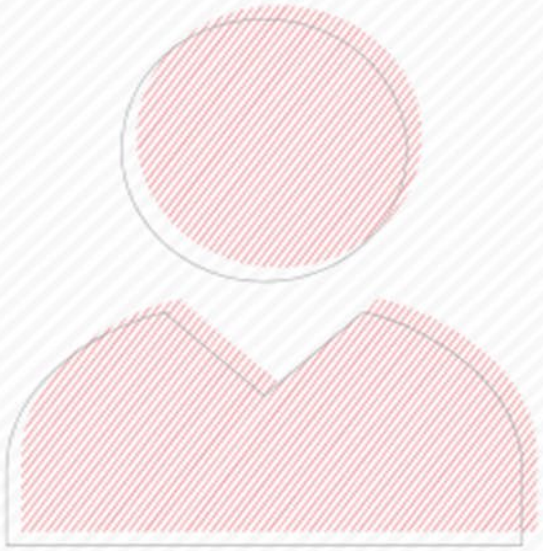
Workshop Training Guide

Morningstar Direct



MORNINGSTAR Direct

Forecasting

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Forecasting

Overview

The Asset Allocation module in Morningstar Direct™ allows users to determine how much of a portfolio to invest in cash, equity, fixed income, alternatives, and other asset classes. To keep users from having to repeat this process for every model portfolio or investment, the Asset Allocation module allows users to create a series of asset mixes to be reused in a variety of cases.

Additionally, the Asset Allocation module has a Forecasting module, which takes your Capital Market Assumptions and predicts the wealth and returns of your portfolio over various time periods through multiple Monte-Carlo simulations, taking into account real-world concerns like inflation and cash flows. You can also create a time-varying mix to see how a young investor's chances of meeting certain return targets by using various asset mixes of various risk levels over time.

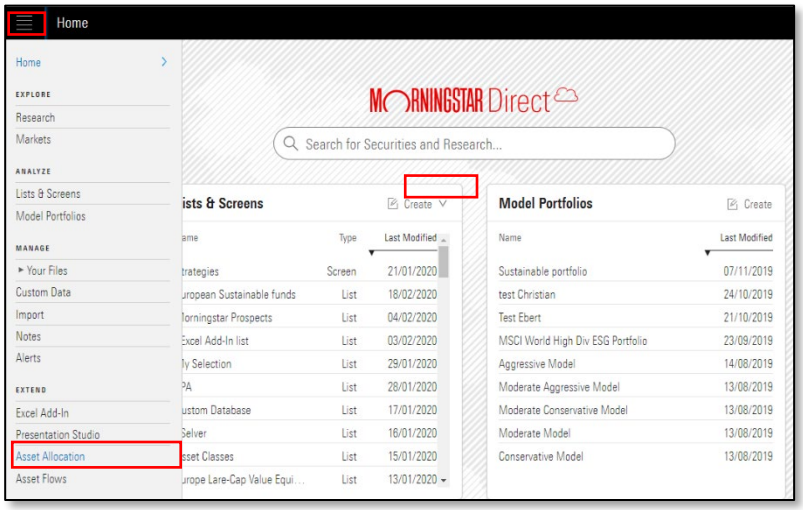
If you have never used Asset Allocation before, we encourage you to watch this video and follow this exercise guide.

Exercise 1: Accessing the Asset Allocation module

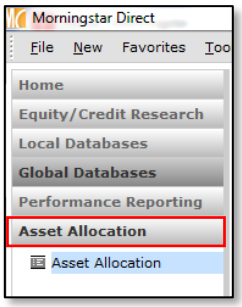
To begin, you can launch the **Asset Allocation** tool in one of three ways:

- Visit the Morningstar web-based Direct homepage at https://direct.morningstar.com, then click the menu bar in the top-left corner and click Asset Allocation on the menu.

  ☞ **Note:** You will need to enter your Morningstar Direct credentials.



- Type http://assetallocation.morningstar.com directly into your web browser (Google Chrome works best).
- Open the Morningstar Direct desktop application, and then in the left navigation panel, click **Asset Allocation**.

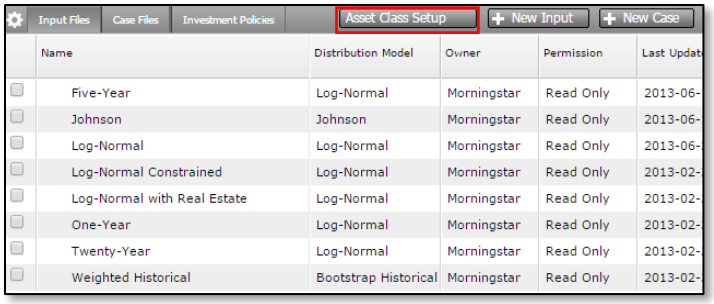


Exercise 2: Setting up Asset Classes

Before creating our case study, we first need to input our asset classes.

To create your asset class set, do the following:

1. Click **Asset Class Setup** at the top of the page. The **Asset Class Setup** dialogue box opens.



Click **Asset Class Setup**

2. Click **New Set > Create**. The **Asset Class Set Name** window appears.
3. Type "Europe Asset Classes" and click **OK**.
4. Click **Add**. The **Add Asset Class** window opens.
5. Enter the asset class name and select the corresponding indexes as shown in the table below.

Asset Class Name	Index Name	SecId
Global Corporate Bond	Morningstar Gbl Bd Infra GR EUR	F00000U3UB
Emerging Europe	Morningstar EM Europe GR EUR	F00000T5XE
Moderate Allocation	Cat 50%Barclays US Agg TR&50%FTSE Wld TR	XIUSA04GT8
UK Equity Mid/Small Cap	FTSE AllSh TR GBP	XIUSA04CGI
High Yield Fixed Income	ICE BofA Gbl HY Constnd TR HEUR	FOUSA06W37
Asia Equity	MSCI AC Asia Pacific NR USD	XIUSA04EW7
Europe Equity Large Cap	MSCI Europe Large NR EUR	F00000UX0N
Global Equity Large Cap	MSCI World High Dividend Yield NR USD	FOUSA06OZ9
Euro Inflation	Eurostat HICP EU NSA	FOUSA088E4

☞ **Note:** If you had saved the indexes as an Investment List, you could retrieve them using the Investment List drop-down menu.

We are adding an asset class to represent Euro inflation, which will then be used to adjust forecasting results for inflation. We will assign constraints to this asset class to ensure it is not used as an asset class for our asset mixes during optimisation.

Once done, the indexes display in the **Asset Class Setup** dialogue box.

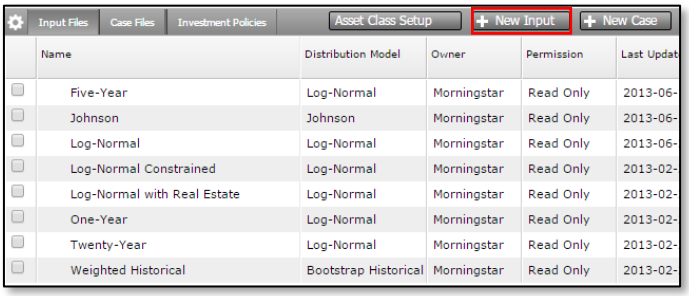
6. Click **OK**. The **Asset Class Setup** dialogue box closes.

Exercise 3: Creating an Input file

Input files are used to store your asset classes, distribution calculations, Capital Market Assumptions and other settings, and to get started in the main part of the **Asset Allocation** tool.

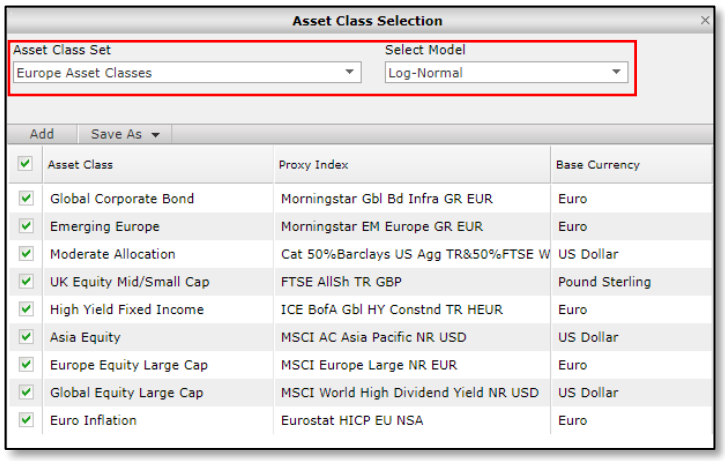
To get started, do the following:

1. From the **Asset Allocation Home** screen, click **New Input**. The **Asset Class Selection** dialogue box opens.



Click **New Input** to get started

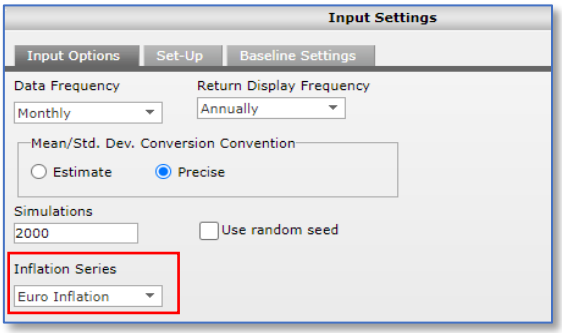
2. Using the **Asset Class Set** drop-down menu, select your saved set of indices.
3. Using the **Select Model** drop-down menu, select the **Log Normal** model.



Select your **Asset Class Set** and **Model**

4. Click **OK**. The **Input Settings** dialogue box opens.
5. Using the **Inflation Series** drop-down menu, select **Euro Inflation**.

We will use this asset class as the inflation rate during the Forecasting exercise.



We will use the default input settings and the Historical model (under the Set-Up tab).

1. Click **OK**. The Asset Allocation window opens.

☞ **Note:** To find out more about the various models and baseline settings, refer to the onboarding asset allocation guide.

Exercise 4: Setting the Time Horizon for your Analysis

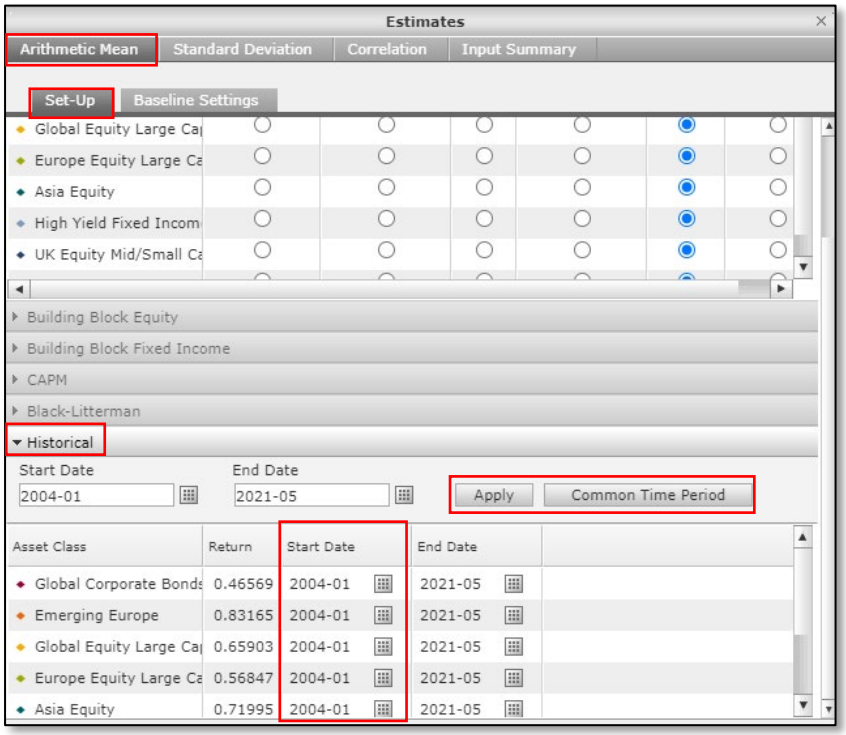
We work first with the **Input Workspace** tab. We will first define a common time horizon.

1. Click the **Estimates** button from the **Input** toolbar.
2. From the **Arithmetic** tab, under the **Set-Up** sub-tab, expand the **Historical** section.

Each asset class start date is listed below, and the **Input Summary** component (top-right of your Input page) is using these time periods to calculate each asset class's arithmetic mean. We want to run an analysis on a common time period. Do the following:

3. Under the **Historical** section, click the **Common Time Period** button.
4. Click **Apply**.

☞ **Note:** The Start Date for each asset class updates to display the common start date.



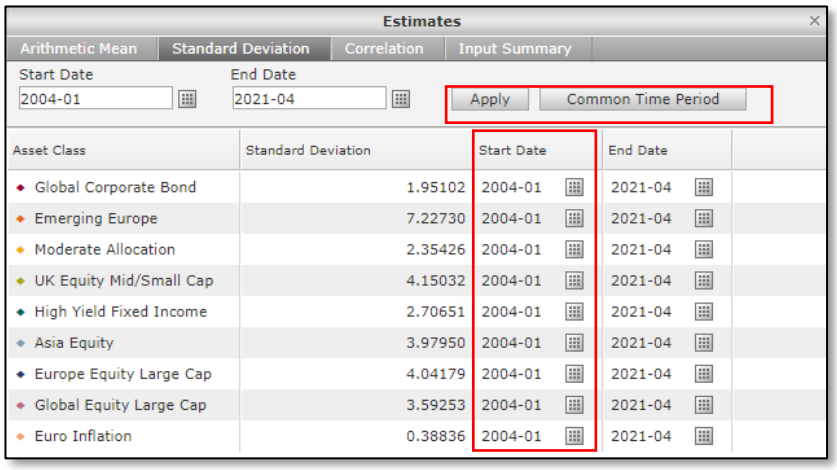
Click **Common Time Period** and then click **Apply**

You have now applied a common time period to evaluate each asset class's arithmetic mean.

We can now apply the same to the Standard Deviation.

1. From the **Estimates** window, click the **Standard Deviation** tab.
2. Click **Common Time Period** and then click **Apply**.

☞ **Note:** The Start Date for each asset class updates to display the common start date.



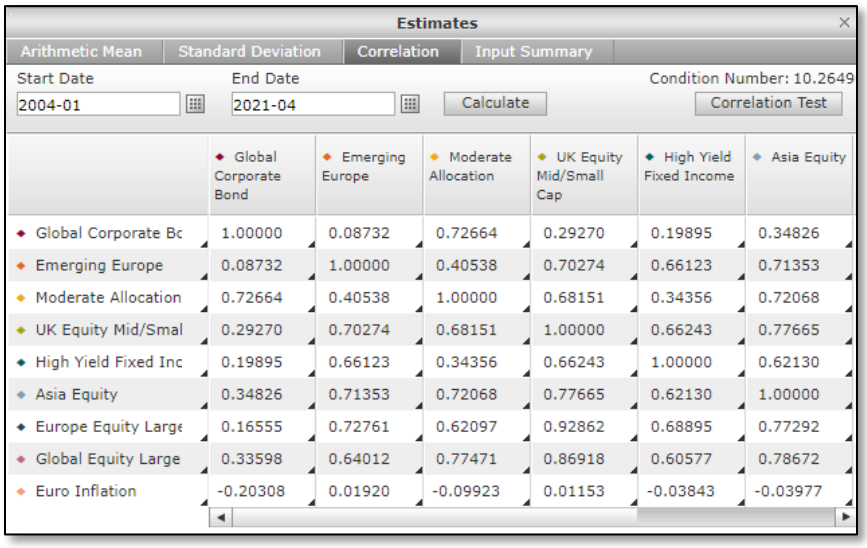
Click **Common Time Period** and then click **Apply**

Correlation Test

When running your analysis, it is important to run a correlation test to ensure there is no overlap of asset classes.

1. From the **Estimates** window, click the **Correlation** tab. Notice how the common time period of all asset classes is already set by default.

The **Condition Number** displays in the top-right corner of the window. This number should be below 20%. Anything higher signifies too much overlap between asset classes. If your condition number is too high, consider removing overlapping asset classes or changing representative indices.



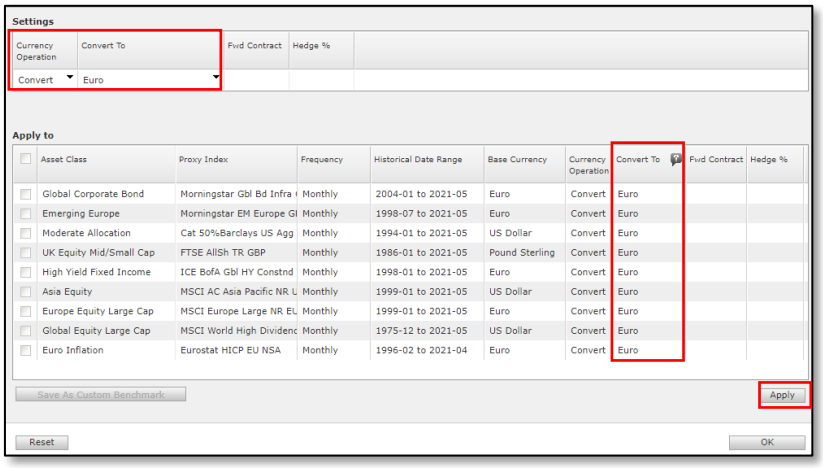
2. Click **OK** to validate your choices.

The Input Summary and Asset Class Statistics (Historical) components recalculate.

Exercise 5: Currency Conversion

We are working with asset classes from various currencies; to reflect the impact of the exchange rate fluctuation, we want to convert those to Euro. To do so, do the following:

1. From the **Input Workspace** tab, click **Currency**. The **Currency** dialogue box opens.
2. Select all asset classes in **US Dollar** and **Pound Sterling** and convert them to **Euro** using the relevant checkboxes to the left.
3. Using the Currency Operation drop-down menu, select **Convert**.
4. Using the **Convert To** drop-down menu, select **Euro**.
5. In the bottom-right corner of the dialogue box, click **Apply**.



Use options as shown in the highlighted areas

☞ **Note:** You will also find **Hedging** options under the **Currency Operation** drop-down menu.

☞ **Note:** You can save a converted asset class as a Custom Benchmark by selecting it and clicking **Save as Custom Benchmark** (it will then be saved under Portfolio Management > Custom Benchmarks in the Direct software.

6. Click **OK**.

Exercise 6: Saving Inputs and Case files

Before moving on to the **Optimisation Workspace**, we can save our work. Each workspace in Morningstar Asset Allocation makes use of two files:

- The **Input file** contains your CMAs (asset classes, distribution model, expected return methodology, constraints)
- The **Case file** contains your asset mixes, the efficient frontier, forecasting information and the layout of your report (how your report looks like, the components you display)

☞ **Note:** To create an input file, you don't require a case file and input files can be used in more than one case file. Changes made to an input file in one case file will show up in another case file that is using those inputs. Therefore, be mindful when saving changes to input files.

☞ **Note:** To create a case file, you require an input file; a case file can also support multiple input files.

To save the **Input file**, do the following:

1. In the top-left corner of the **Morningstar Asset Allocation** window, click the **Gear** icon  .
2. Click **Save Inputs as**. The **Save Input File** dialogue box opens.
3. Type **Europe Input file**.
4. Click **OK**.
5. Click **OK** again on prompt.

To save the **Case file**, do the following:

1. In the top-left corner of the **Morningstar Asset Allocation** window, click the **Gear** icon  .
2. Click **Save Case as**. The **Save Case File** dialogue box opens.
3. Type **Europe Case file**.
4. Click **OK**.
5. Click **OK** again on prompt.

At this point, you could decide to assign constraints to ensure your asset classes have a low and high ceiling.

Exercise 7: Assigning Constraints

Constraints are saved as part of our **Inputs file** and are set to ensure a minimum/maximum allocation per asset class or group of asset classes.

To set **Constraints**, do the following:

1. From the **Optimizer** Workspace toolbar, click **Constraints** (it is also available from the **Input Workspace** toolbar).

   ☞ **Note:** There are three types of constraints: **Individual**, **Group**, and **Relative**.

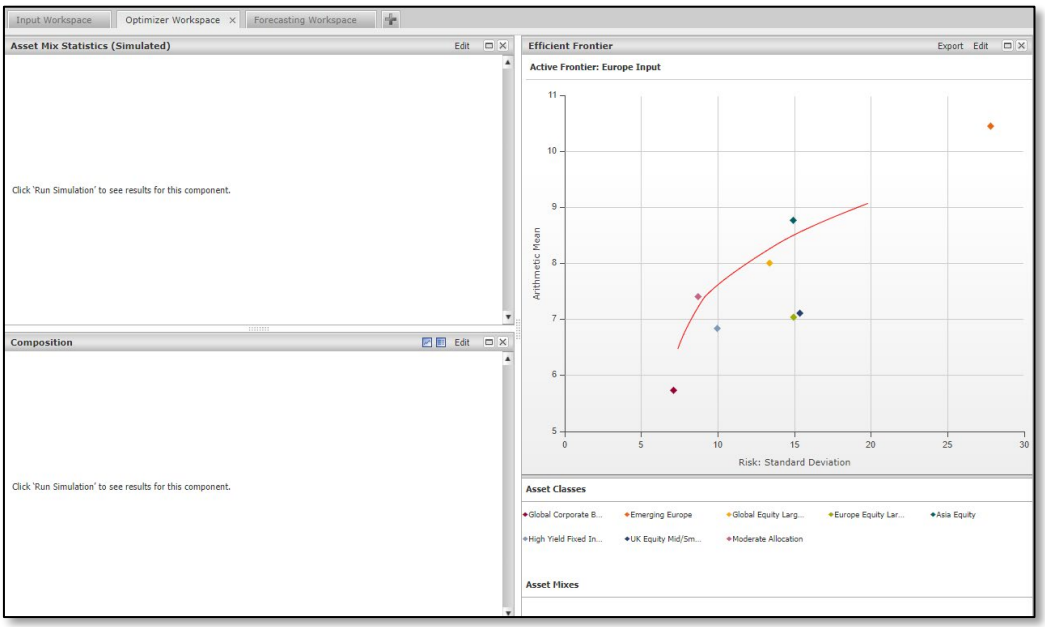
2. Set your constraints as shown below:

Asset Class	Min Holding	Max Holding
Moderate Allocation	5	100
UK Equity Mid/Small Cap	5	100
High Yield Fixed Income	10	100
Asia Equity	10	100
Europe Equity Large Cap	10	100
Global Equity Large Cap	0	60
Emerging Europe Equity	0	50
Global Corporate Bond	5	100
Euro Inflation	0	0

We assign 0% as maximum Holding for the Euro Inflation asset class since we only want to use it when forecasting our asset mixes' returns but we do not want it to be part of an asset mix during the optimisation.

3. Click **OK**.

The **Efficient Frontier** chart updates.



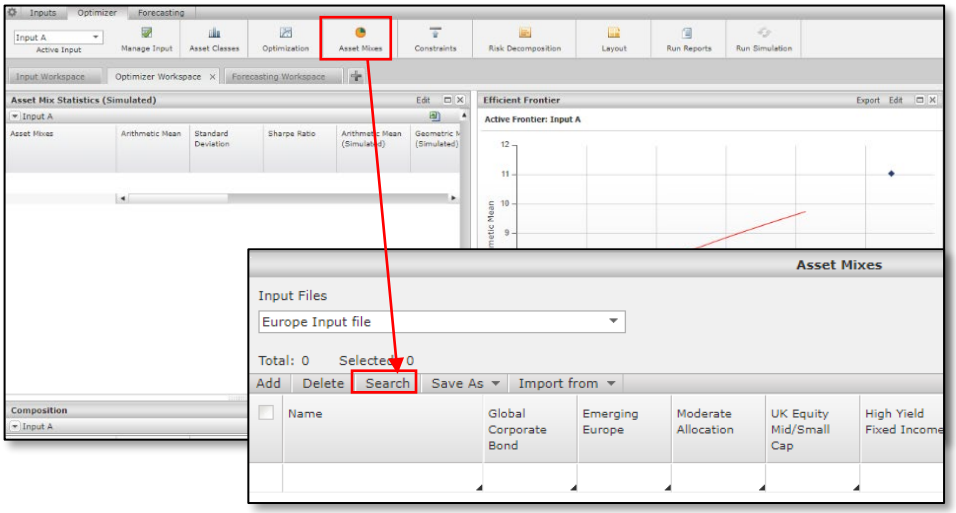
4. Click the **Gear** icon to save your **Inputs file**.
5. Click the **Gear** icon to save your **Case file**.

Exercise 8: Searching for Asset Mixes of various Risk Levels

We now want to see search for various asset mixes with various risk levels. We can do this using the **Asset Mix** option. To search for asset mixes, do the following:

1. From the **Optimiser** tab, click **Asset Mixes** on the **Toolbar**. The Asset Mixes dialogue box opens.

Click here to work with **Asset Mixes**



Click **Search**.

2. Click **Search**. The **Asset Mix Search** window opens.

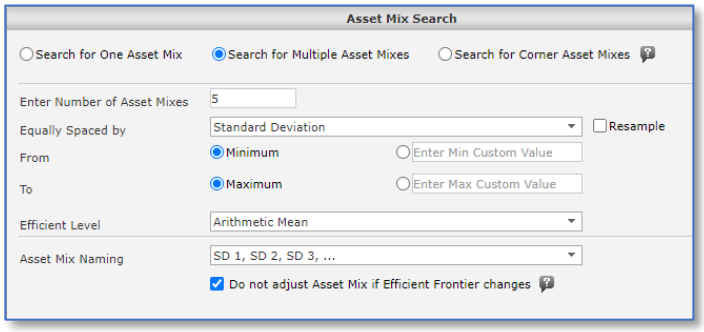
At this point, you can either decide to search for an asset mix of a specific Arithmetic Mean or Standard Deviation, or you can ask the system to search for multiple asset mixes spread along the efficient frontier.

In this exercise, we want to search for 5 asset mixes with risk levels from conservative to moderate to aggressive. Do the following:

3. Select the radio button for **Search for Multiple Asset Mixes**.
4. In the **Enter Number of Asset Mixes** field, type **5**.
5. Using the **Equally Space By** drop-down menu, select **Standard Deviation**.
6. Leave from **Minimum** to **Maximum** selected.

> ☞ **Note:** You could alternatively specify a minimum and maximum number, as long as they are covered by the efficient frontier.

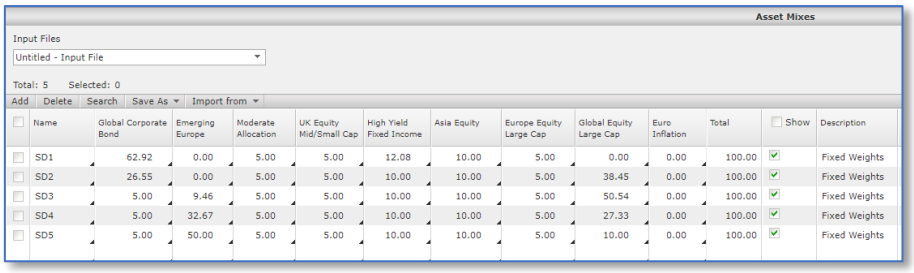
7. Using the **Asset Mix Naming** drop-down menu, select the naming convention **SD 1, SD 2, SD 3,…** or create your own.



8. Click **OK**.

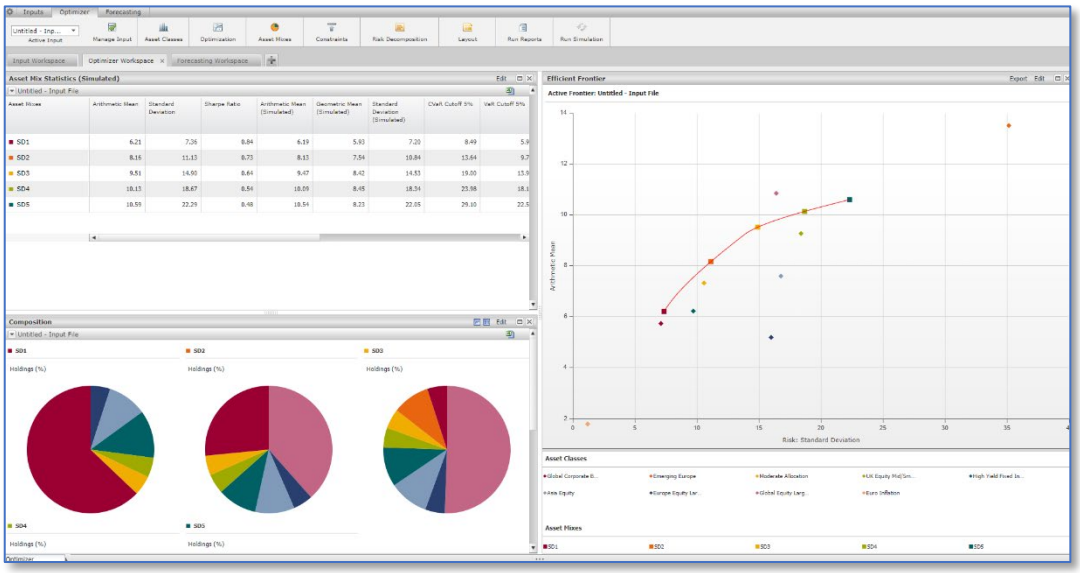
The 5 asset mixes and their breakdown now display in the Asset Mixes window.

9. Click **OK** to return to the efficient frontier.



Name	Global Corporate Bond	Emerging Europe	Moderate Allocation	UK Equity Mid/Small Cap	High Yield Fixed Income	Asia Equity	Europe Equity Large Cap	Global Equity Large Cap	Euro Inflation	Total	Show	Description
SD1	62.92	0.00	5.00	5.00	12.08	10.00	5.00	0.00	0.00	100.00	✓	Fixed Weights
SD2	26.55	0.00	5.00	5.00	10.00	10.00	5.00	38.45	0.00	100.00	✓	Fixed Weights
SD3	5.00	9.46	5.00	5.00	10.00	10.00	5.00	50.54	0.00	100.00	✓	Fixed Weights
SD4	5.00	32.67	5.00	5.00	10.00	10.00	5.00	27.33	0.00	100.00	✓	Fixed Weights
SD5	5.00	50.00	5.00	5.00	10.00	10.00	5.00	10.00	0.00	100.00	✓	Fixed Weights

We now see the asset mixes on the **Efficient Frontier** and in the **Asset Mix Statistics** and **Composition** components.



Exercise 9: Forecasting Returns

The Forecasting Workspace takes your Capital Market Assumptions and predicts the wealth and returns of your portfolio over various time periods using the Monte-Carlo simulations, taking into account real-world concerns like inflation and cash flows. Four components are included by default here:

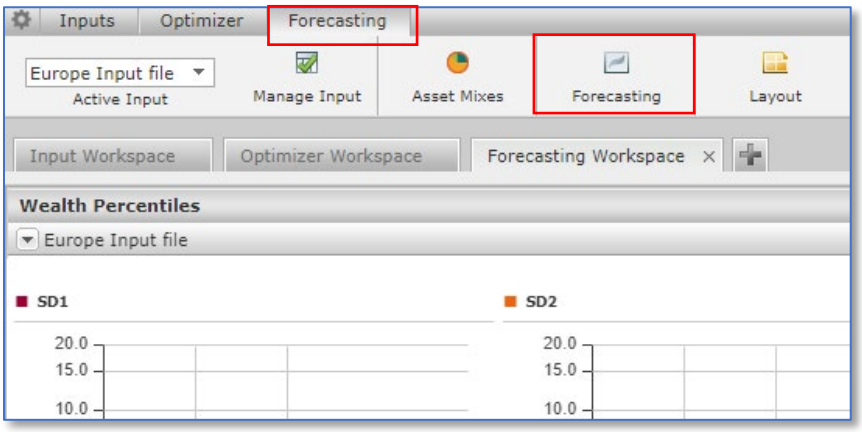
- Wealth Percentiles look at your Projection Years and display selected Percentiles of chances of meeting your defined Target Values.
- Return Percentiles look at your Project Years and display selected Percentiles of changes of meeting your Target Returns.
- Composition displays the asset mixes defined on the Optimiser tab.
- Cash Flow Summary displays any selected cash in- and out- flows during your investment period.

Several settings can be updated in these components, including toggling between graphs and tables, changing the initial investment amounts, and deciding whether to map an accumulation scenario or a draw-down scenario.

A wide variety of options is available when forecasting outcomes in the Asset Allocation module. For example, users can project what would happen if a client made regular contributions to an asset allocation, what would happen for someone in retirement who needed annual income, or a combination of contributions and withdrawals. This exercise shows users how to forecast the outcomes for a retirement withdrawal scenario and regular cash inflows before the client's retirement date, and then review what that cash flow will actually look like.

To use the **Forecasting** feature, do the following:

1. Click the **Forecasting Workspace**.
2. From the **Forecasting** toolbar, click the **Forecasting** icon. The **Forecasting Settings** window opens.



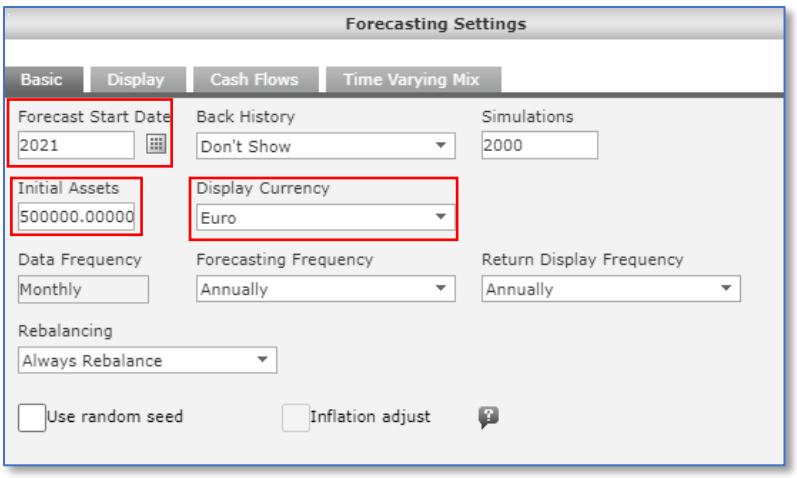
This icon is not available unless the **Forecasting** tab is selected

On the **Basic** tab, you will need to set up the following options:

- **Forecast Start Date**: this year's date is selected by default. you should select the year representing the start of your forecast, meaning the year your client will start investing from.
- **Initial Assets:** the default is 1. You should choose the default investment and currency of your client.
- **Display Currency**: the default is US Dollar. You will need to select the currency you are working in.
- **Forecasting Frequency** controls how often things happen in the simulation. For example, in a monthly forecasting frequency you can apply cash flows and see wealth values monthly; in an annual forecasting frequency you can only do this annually.
- **Return Display Frequency** controls the scale the returns are shown in. For instance, do you want to see an annualised return or the monthly return you could expect to receive?
- **Rebalancing:** choose to always/never rebalance or rebalance periodically by percent/amount. You will then have the option to specify by what percentage/amount and every Nth time period.

For our exercise, we will apply the following settings:

1. Set the **Forecast Start Date** to **2021**.
2. Set the **Initial Assets** to **500000** (or the amount of your choice).
3. Set the **Currency** to **Euro** (or the currency of your choice).
4. We will leave the other options on their default setting.



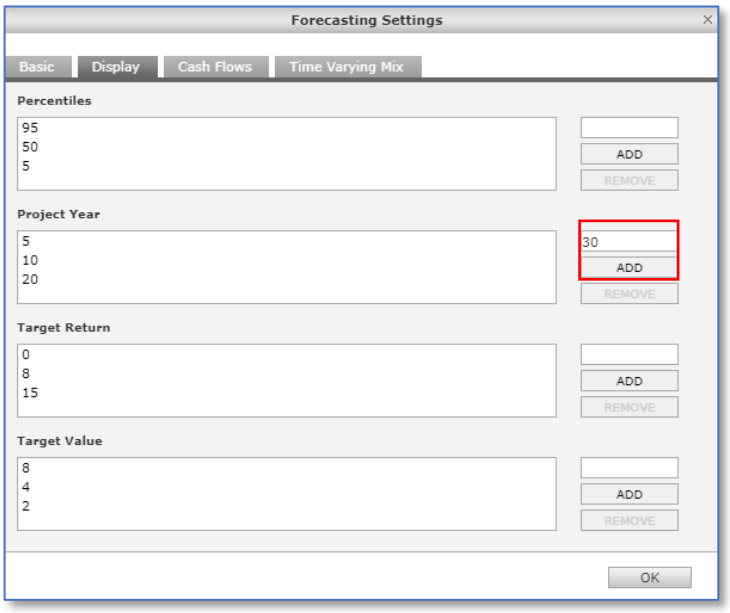
Note how there is a checkbox to **Inflation adjust**. This is where you will activate the inflation adjustments for graphs and tables in the Forecasting Workspace. This will not affect Cash Flows, we do have a separate setting for this, which will be covered in the exercise Adding Inflating-Adjusted Cash Inflows.

As a reminder, we added an asset class to our asset class set to represent our inflation, and we defined the asset class to be used as inflation in the Inputs Workspace. See Exercise 3: Creating an Input File.

Exercise 10: Adding a Projection Year

In this scenario, we want to forecast returns 30 years in the future, which is not an option by default. Do the following:

1. Click the **Display** tab.
2. From the **Project Year** area, click in the input field, type **30**.
3. Click **Add**.



Note the value to enter in this field, then click **Add**

We will now proceed adding our cash flows.

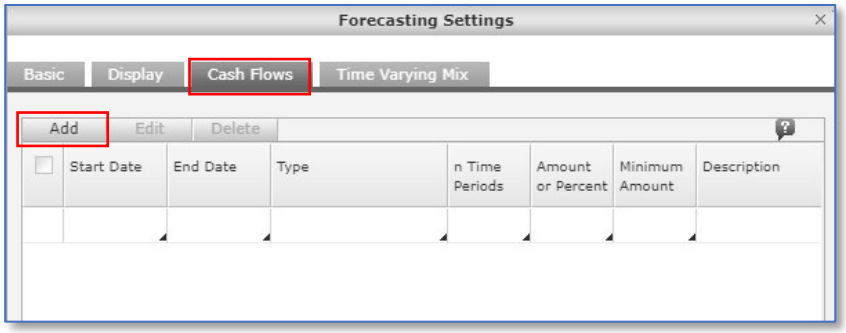
4. Click the **Cash Flows** tab.

Exercise 11: Adding Cash Flows

Cash Flows can be added to your forecasting. In this exercise, you will learn how to forecast the outcomes for a retirement withdrawal scenario as well as regular cash inflows taking inflation into account before the client's retirement date, and then review what that cash flow will actually look like.

Adding a Retirement Withdrawal Scenario

5. Click **Add**. The **Add Cash Flow** dialogue box opens.



Click this button to add the details around the cash flow for the scenario

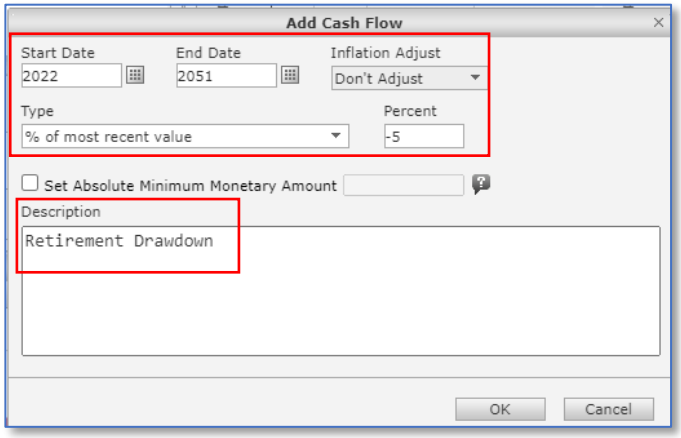
6. In the **Start Date** field, enter **2022**.
7. In the **End Date** field, scroll right and enter **2051**.

☞ **Note:** If you can't select 2051, go back to the Display tab and ensure you added **30** to the **Project Year** area.

8. From the **Type** drop-down field, select **% of most recent value**.
9. In the Percent field, type **-5**.

☞ **Note:** The value here needs to be negative, to correctly calculate the withdrawal amount.

10. In the **Description** field, type **Retirement Drawdown**.



Note the values for the highlighted areas.

11. Click **OK** to close the **Add Cash Flow** dialogue box.

Adding Inflation-Adjusted Cash Inflows

We also want to indicate a yearly inflow of €10,000 over the years until 2031 and €15,000 until 2051. We will inflation adjust them to see how they will grow with inflation.

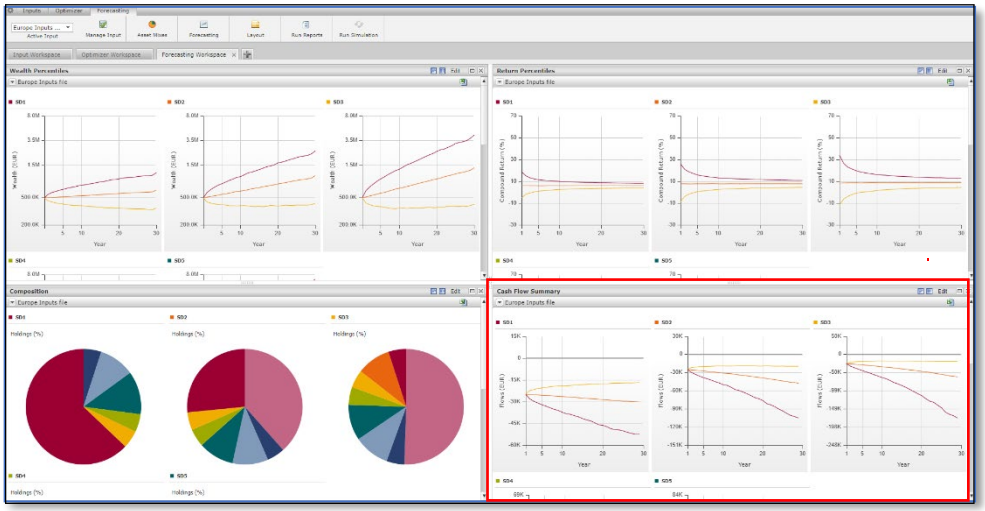
Do the following:

1. Under the **Cash Flows** tab, click **Add**.
2. In the **Start Date** field, select **2022**.
3. In the **End Date** field, select **2031**.
4. Using the **Inflation Adjust** drop-down menu, select **Adjust**.
5. Using the **Type** drop-down menu, select **Monetary Amount**.
6. In the **Amount** field, type **10000**.
7. Click **OK**.
8. Click **Add** once more.
9. In the **Start Date** field, select **2032**.
10. In the **End Date** field, select **2051**.
11. Using the **Inflation Adjust** drop-down menu, select **Adjust**.
12. Using the **Type** drop-down menu, select **Monetary Amount**.
13. In the **Amount** field, type **15000**.
14. Click **OK** to return to the **Forecasting Settings** window.
15. Click **OK** to return to the **Forecasting Workspace**.

Expand the Cash Flow Summary component. In the table below the charts, note the inflows over the various Projection Years.

Asset Mix	Projected Year	95th Percentile		50th Percentile		5th Percentile	
		Inflow	Outflow	Inflow	Outflow	Inflow	Outflow
SD1	5 Year	11149.07	-34491.16	10727.63	-27810.28	10341.50	-22548.28
SD1	10 Year	12448.05	-43212.75	11716.64	-31556.71	11072.17	-23485.63
SD1	20 Year	38118.48	-71522.35	35031.09	-49534.51	32126.67	-35330.94
SD1	30 Year	46443.31	-107816.88	41819.96	-72902.16	37801.53	-49871.62
SD2	5 Year	11149.07	-40850.39	10727.63	-29463.40	10341.50	-21908.86
SD2	10 Year	12448.05	-56785.65	11716.64	-36341.50	11072.17	-23111.51
SD2	20 Year	38118.48	-107312.51	35031.09	-62314.58	32126.67	-36841.23
SD2	30 Year	46443.31	-187022.01	41819.96	-100152.44	37801.53	-55374.17
SD3	5 Year	11149.07	-46652.43	10727.63	-30520.53	10341.50	-20581.16
SD3	10 Year	12448.05	-70176.46	11716.64	-39288.72	11072.17	-21614.66
SD3	20 Year	38118.48	-150233.72	35031.09	-72153.67	32126.67	-35403.71
SD3	30 Year	46443.31	-284455.56	41819.96	-120552.94	37801.53	-53473.00
SD4	5 Year	11149.07	-51058.07	10727.63	-30538.20	10341.50	-18985.11
SD4	10 Year	12448.05	-82027.32	11716.64	-39371.58	11072.17	-18987.70
SD4	20 Year	38118.48	-187460.65	35031.09	-74315.92	32126.67	-32025.02
SD4	30 Year	46443.31	-376022.24	41819.96	-124266.78	37801.53	-46236.87
SD5	5 Year	11149.07	-56367.14	10727.63	-30304.91	10341.50	-17439.39
SD5	10 Year	12448.05	-94189.03	11716.64	-38821.35	11072.17	-16709.95
SD5	20 Year	38118.48	-221322.64	35031.09	-73396.09	32126.67	-27821.41
SD5	30 Year	46443.31	-455598.04	41819.96	-122793.77	37801.53	-39158.70

16. In the Cash Flow Summary component, click the **Maximise** icon. This component is described in the next section.



What does the Cash Flow Summary component show?

The Cash Flow Summary component shows how much money a client will potentially be able to withdraw on an annual basis if they adhere to the asset allocation over time. Note the following important points about this component:

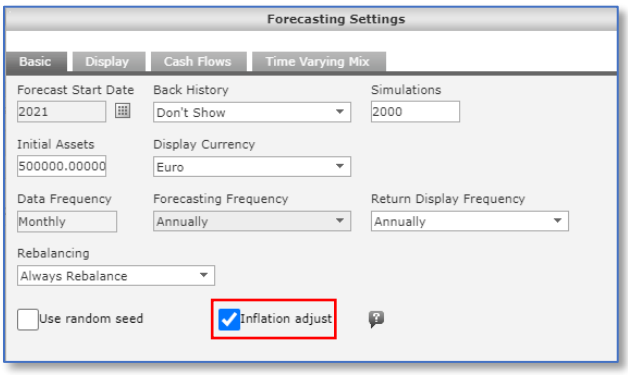
- For each year, three possible outcomes are shown. The 95th percentile is the best possible outcome; only a 5% chance exists of this happening. The 5th percentile is the bear-market scenario. There's a 95% chance the client will have at least this much money in a particular year. The 50th percentile represents the midpoint of outcomes for any one year. Half of the outcomes were worse than this value, and half were better.
- Focus on the asset allocation of each asset mix. For instance, what is the 5th Percentile value in year 30 for the SD1 (conservative) vs. SD5 (more aggressive) asset mix?
- Move the cursor over each graph to see the outflow values for any particular year.

Exercise 12: Inflation Adjusting Returns

The Forecasting Workspace also allows you to inflation adjust returns and cash flows. Selecting this option will display wealth and return percentile values in real terms. You will also be able to inflation adjust cash flows into your asset mixes.

To activate this function, do the following:

1. From the **Forecasting Workspace** toolbar, click **Forecasting**.
2. Under the **Basic** tab, click the checkbox for **Inflation adjust**.



3. Click **OK**.

The Wealth Percentile and Return Percentile components now reflect inflation. You may scroll down the component to the table below to view the values.

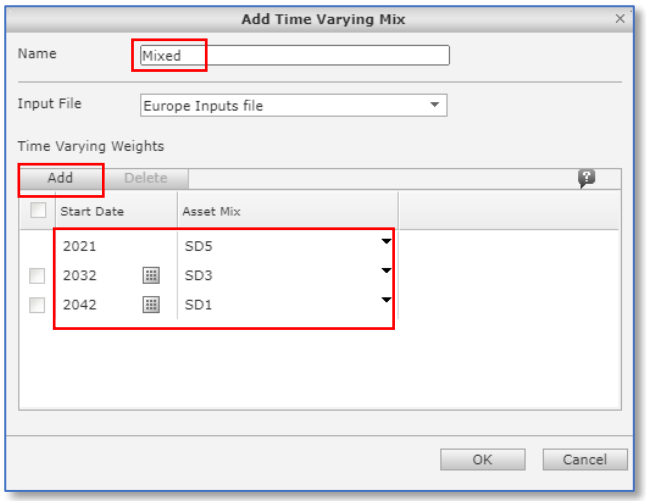
Exercise 13: Creating a Time Varying Mix

The Forecasting Workspace also offers the possibility to create a Time Varying Mix. This function is useful to get an overview of a client's investments over time with different asset mixes.

For instance, a young investor will most likely invest in a more aggressive asset mix in early years, but as the years pass, the investor will more likely more to a more moderate and eventually more conservative asset mix.

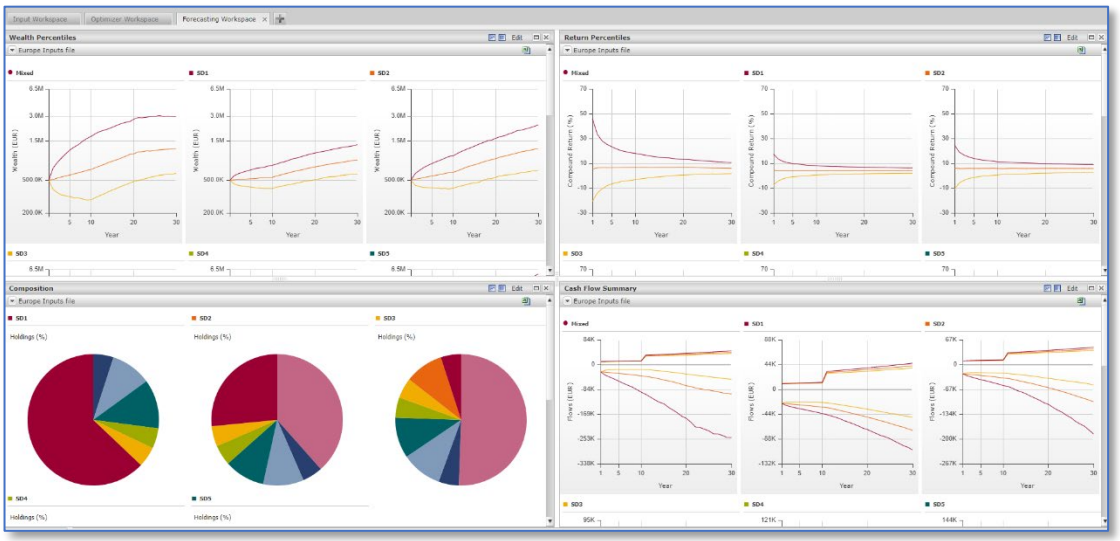
To create a time varying mix, do the following:

1. From the **Forecasting Workspace** toolbar, click **Forecast**. The **Forecast Settings** window opens.
2. Click the **Time Varying Mix** tab.
3. Click **Add**. The **Add Time Varying Mix** window opens.
4. In the **Name** field, type "Mixed".
5. **2021** already displays as our **Start Date**.
6. Using the **Asset Mix** drop-down menu, select **SD5** (our more aggressive asset mix).
7. Click **Add**.
8. Double-click row 2 in the **Start Date** column and type **2032**.
9. Using the **Asset Mix** drop-down menu, select **SD3** (our more moderate asset mix).
10. Click **Add**.
11. Double-click row 3 in the **Start Date** column and type **2042**.
12. Using the **Asset Mix** drop-down menu, select **SD1** (our more conservative asset mix).



13. Click **OK**. You are returned to the **Forecasting Settings** window.
14. Click **OK** to return to the **Forecasting Workspace**.

An additional chart is now added to the Wealth Percentiles, Return Percentiles and Cash Flow Summary using this new Time Varying Mix.



Overall, we notice that we have better chances of meeting our targets with this time varying mix than with the more conservative and moderate asset mixes.